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Extract from the Political Code.

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SEC. 2298. The Controller, if notified by the Librarian that any officer has failed to return books taken by him within the time prescribed by the Rules, and after demand made, must not draw his warrant for the salary of such officer until the return is made, or three times the value of the books, or of any injuries thereto, has been paid to the Librarian.

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No person shall take or detain from the General Library more than two volumes at any one time, or for a longer period than two weeks. BOOKS OF REFERENCE SHALL NOT BE TAKEN FROM THE LIBRARY AT ANY TIME.—[Extract from the Rules.

☞The foregoing Regulations will be strictly enforced.☜

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JANUARY 4, 1879. VOLUME XXXVIII Number 1.

A Practical Traction Engine.

[Written for the PRESS.]

The subject of transportation by means of the road-locomotive, or traction-engine as it is called, has occupied the attention of engineers in all parts of the world. It is believed that California has produced a machine that stands among the best forms of the road-locomotive; from late tests it appears to be one of the most practicable engines of this class that has ever been introduced.

The accompanying engraving represents one of these machines, on three wheels, all of which are propelled hy beveled gearing.

The following are the principal dimensions: Boiler—length over all, 10 feet; boiler, diameter of shell, 48 inches; boiler, thickness of shell, ¼ inch; boiler, fire box sheets, ⅜ inch; load on driving wheels, 2,300 pounds; steam cylinders, diameter, 8 inches; stroke of pistons, 12 iuches; revolutions of crank to one of driving wheels, 10; driving wheels, diameter 72 inches; driving wheels, breadth of tire, 12 inches.

The boiler is a new and peculiar multitubular arrangement, which makes steam as fast as required, from a comparatively small amonnt of water, doing away with considerable bulk and weight. There are two engines mounted on top of the boiler; the crank-shafts are coupled and the cranks are set quartering to avoid the possibility of ever stopping on tho center; the bed plates have the cross-head guides cast solid with the bed; and the cyiinders are secured in sliding hearings fastened by flanges to boiler-brackets; hy this means the expansion and contraction of the hoiler is accommodated, avoiding a considerable strain on the engines. The driving-gears or angle-shafts, are on each side of the machine as shown, and are driven by the beveled pinions on each end of the engine shaft. The angle-shafts ruu in angle bracket-boxes, so that one pair of shafts having beveled pinions run the forward wheel-gears, and the other pair of angle-shafts also have heveled pinions that drive beveled wheels sccured to the rear traction wheels. The forward driving gears are keyed to the outer ends of the forward axle, or driving shaft, more properly speaking, as the latter drives the forward or steering wheel, but at the same time allowing it to be moved in au arc of a circle sideways at any angle desired for steering the machines. This is accomplished by means of a ball and socket joint in tbe huh of this wheel.

This ball and socket joint is the most ingenious part of the whole machine, and to accomplish the work of driving the wheel in all positions, a numher of steel keys are fitted in the ball, aud projecting to work in slots cut in the shell or casing of the ball.

This casing has projecting faces with revolving rings on each side of the wheel, and to these rings are bolted arms on each side running back to a gear segment, operated by a pinion on the end of an upright spindle or shaft with a hand-wheel at the top, just in front of the steersman's seat; here the man piloting the machine has control of the throttle valve and reverse lever.

This is the first instance in which the steering wheel has been made to propel tbe machine; and it can be made to do the work independent of the bind wheels, in case of necessity; as for instance when both hind wheels become mired, or get into quicksand, or deep ruts in the road. This is accomplished by having self-adjustable clutches on the hind wheel shaft, also for backing, etc.

In all of the traction engines heretofore built, only two wheels have been employed to propel the machine, but in this invention all of the wheels on which it runs are traction wheels, and more than three may be employed if desired. This machiue was used for a considerable length of time in the State of Nevada, hauling ore and other freight from mines to mills, etc., running up mountainous roads (where mule teams had been used); the grade being in some instances 530 feet to the mile, and hauling ten tons on wagons at a speed of two and one-half miles per hour. After working for one company until tbeir mines gave out, the machine was brought to Sacramento, where it was employed in house moving and other heavy work.

The Sacramento Wood Co. have recently bought a Pacific coast interest in this invention, and have put the machine to a very severe test, showing its ability to haul heavy freight in a successful manner. Capt. J. Roberts, the leading spirit of the company, took this machine up the Sacramento river on one of their steamers, and landing in Colusa county, where they run regular trips back into the country, a distaace of 16 miles, taking freight from the steamer, and bringiug wheat back, they loaded six Bain header wagons with 300 sacks of grain, also hauling one extra Bain beader wagon contaiuing a tank in which they took 615 gallons of water, besides 1½ tons of coal, making over 24 tons total freight in wagons; tbe machine also carried tanks secured at each side of the hoiler, these bolding 250 gallons of water. Five miles of the road was very dusty, and full of ruts, we had several sloughs to cross, making a very severe test of the traction power of the machine. But if the roads are level, hard and free from ruts, the machine is capable of hauling 35 tons at a speed of three miles per hour.

The machine works admirably as to pulling or traction qualities. The machine weighed on the scales—having steam up and 250 gallous of water in the tanks, also coal in the cab—11½ tons total weight.

Capt. Roberts' Company has plenty of work for a large number of these machines, as they haul freight from various points throughout the Sacramento and San Joaquin valleys to their steamboats and barges on the rivers.

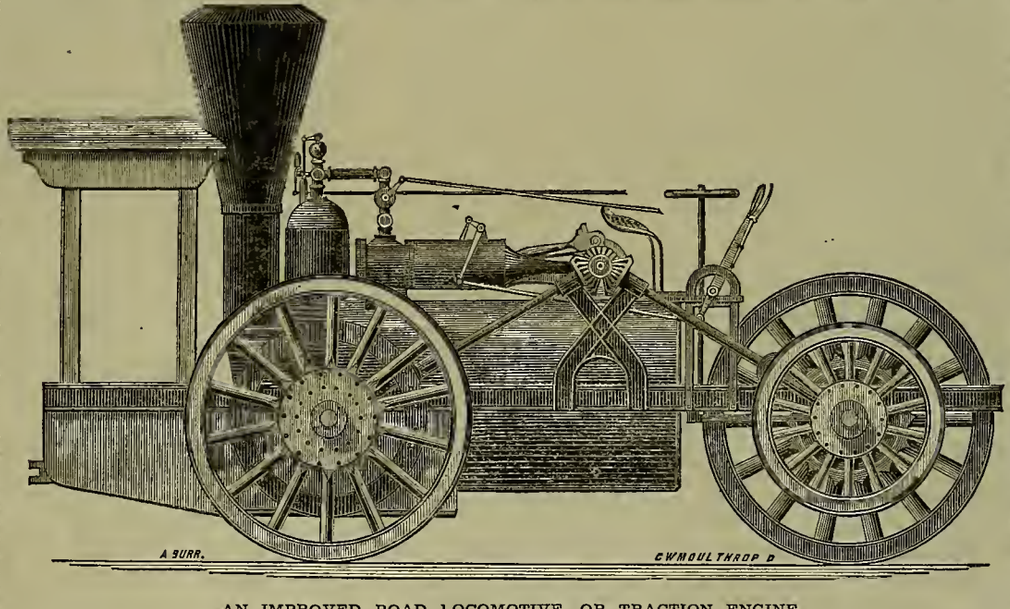
This traction engine will run over any kind of ground; it can enter any farmer's field, plow his ground, and at the proper time haul away his grain or other freight, running in any direction without reference to depots or tracks that at present are so necessary for tbe transportation business of the country.

From the recent trial of this engine, the constructing engineer deduced tbe following conclusions: A traction engine, or road locomotive, may be constructed upon this plan, so as to be easily and rapidly manœuvred, hauling a long line of freight wagons on the ordinary roads, and turning without difficulty on a circle such as are common at all cross-roads.

A locomotive weighing six tons is capable of haubng 25,000 pounds up a grade of 525 feet to the mile at a speed of 3½ miles an hour. The traction-power of the machine tested was eqnal to 30 horses.

The coefficient of traction was shown to be about 0.5; the weight that could be drawn on a perfectly smooth and level road was 175,000 pounds; this is exclusive of the weight of the engine, and the amount of fuel required is estimated at 500 pounds a day. In handling the machine the most experienced and skillful men are required. The difference between the performances of the same engine in different hands was 12%.

It is estimated that the expense in heavy hauling hy steam is 25% less than the cost of horse-power on an ordinary road. A much larger and more powerful machine is now being built for the company by Root, Neilsou & Co., Sacramento. The inventor is Mr. R. R. Doan, who commenced many years ago to study the problem of substituting steam power for auimal power on the highways and for farm use. After years of toil and the expenditure of a large amount of money, buildiug the machine in several styles, he has profited by the experience, and we believe that he has accomplished the desired result, in the road locomotive represented by our engraving. C. W. M.



AN IMPROVED ROAD LOCOMOTIVE, OR TRACTION ENGINE.

The Bodie Claims.

The Bodie mines were taken up under United States law, and held as from the United States. But now it transpires that tho United States did not own the land occupied by many of the chief mines; on the contrary, the State owned them, and the United States could not allow any one to hold them either by yearly work or by purchase—in fact, bad no claim on them whatever. The State owns the 16th and 36th sections of every township. She was granted them for school purposes. Owning them she has a right to sell them. This she has done in the preseut case, and there was no stay in her proceedings, because the 16th section of one township contained some of Bodie's richest mines. The plat of survey of the land in question was filed on March 16th, 1878. At that time those who were located on the 16th section might have known how they were situated. From that date they were allowed the refnsal of the land for six months. Those six months have passed. The locators bave not purchased from the State. Others have taken advantage of this negligence, and bave bought the land and hold a State title to it. The title seems to be good, and all that Bodie can do is to compromise. The interested mines are: Bodie, South Bodie, South Standard, Red Cloud Consolidated, Belvidere, Bodie Tunnel and Mining Company, Summit, White Cloud, Goodshaw, Aurora Tunnel, Maybelle, Concordia, Noonday, Richelieu, Champion, Sigourney, Mono, Mono and Cross Consolidated, Bodie Hydraulic, Lady Alice Tunnel and Mining Company, Relief Consolidated, South Bulwer, part of the Bulwer Rustler, Dudley, Requizon, Republic, Booker, Humboldt, Double Standard, Jupiter, Glynn, Daily, South Belvidere, and the placer claims of Wm. Irwin, Johu F. Boyd, G. S. Morton and others. The South Bulwer has compromised.

Bodie stock has been surprisingly low for some weeks past. It has exhibited a deadness which grew, perhaps, out of some premonition, if not positive knowledge, of this trouble. It will be a great pity if this flourishing town is to receive a set back here on the very threshold of so promising a career. Mining towns in the first few years of their growth are particularly liable to such disorders. But perhaps none other ever received such an aggravating blow as this that has been dealt Bodie.

BOSWELL FRUIT DRIER.—We call attention to the advertisement of the Boswell heater oompany on page 16 of this issue. The principle of deflected heat as applied to drying fruit seems to he worthy the attention of all interested in that branch of industry. The combined apparatus for cooking, baking, beating, drying, etc., is a great auxilliary to the economy of housekeeping, and the apparatus is also claimed to he the most economical as well as the best arrangement for drying fruit, etc., that is now before the public. Mr. E. L. Sullivan, an old and well-known citizen of the State, is at the head of the company.

THE Salt River *Herald* says: Messrs. I. N. Cohen & Co. have received 30,000 pounds of copper from the Longfellow oompany during the past week; shipping 20,000 to the railroad dnring tbe same time.

WORK progresses favorably at the Black Jack, Idaho.

PACIFIC COAST POSTAL CHANGES.—Following are the postal changes for the week ending Dec. 29th: Offices Established—Novelty, Kings county, Washington Territory, George B. Boyce, Postmaster. Asbley, Wasatch county, Utah, Wm. H. Wallis, Postmaster. Offices Discontinued—Laplays, San Luis Obispo county, California. Name Changed—Willow Forks, Umatilla county, Oregon, to Pettysville. Postmasters Appointed—Charles Crandall, Altoona, Trinity county; Karl H. Plate, Tyrone, Sonoma county, California. Henry Williams, Sweetwater, Esmeralda county, Nevada. David Sommers, Summersville, Union county; Josbua Pullen, Zion, Clackamas county, Oregon. Samuel Egesley, Silver Spring, Salt Lake county, Utah.

THE Little Emma, Democrat mountain, Colorado, was discovered in May, 1877. It has since produced $22,853.09 net.

THE Tiptop company, at their mill, Gillett, are producing silvor bullion at the rate of $50,000 a month.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Scenes in the High Sierra Back of Yosemite—Continued.

[Written for the PRESS by J. G. LEMMON.]

No. 2. Mount Lyell and its Glaciers.

"Who has not heard of the lofty Lyell group of peaks, and of their system of still living glaciers?" The dignified Prof. Whitney has ably described them in the cold exact terms of science, and the Bonny Scot, Johnny Muir, has set them forth in warm, glowing language, that is just as truthful, and ten times more readable for the average mind. "Who would not visit them from a distance, if able, especially, who would not make a desperate effort if he happened to be in sight of the glistening pinnacles, even though his back was nearly broken?" Thus I reasoned as I looked off from the dizzy crown of *Tis-sa-ack*, and studied the approaches to the wondrous group lying about 20 miles distant, as the bird flies, but with many miles of bald ridges and tortuous, wooded, dark valleys between. But resolution and ability were not in accord this time. The next morning I was unable to saddle my horse, and the next after, found me too weak to venture the chances of a toilsome, dangerous excursion, especially as I was alone. But to acquire strength I moved painfully about the woods near Anderson's cabin, securing among other rare plants, the *Bolandra Californica*, Gray, the type of a genus composed of a single species, and dedicated to Prof. Bolander, who, with the founder of the genus, are the only botanists that are reported to have met with the plant. The curious plants belongs to the saxifrages, very singularly combining in itself the charactere of four or five of the genera.

Another striking plant growing here in a grassy bog, was discovered by Bolander, in the Mariposa station meadows, and named by him *Senecia Clarkianus*, in honor of Galen Clark, the genial pioneer of this region, and the present guardian of Yosemite valley.

The third morning found me on the Mono trail leading my burdened horse up the pass to Cathedral valley. The trail was in places obliterated by roving bands of sheep, causing much delay in searching for it, for attempting to proceed by any other way was fruitless. It was late in the eve when, after treading the long valley skirting the curious Cathedral, crossing spurs and winding around glacier lakes, I began to descend into a deep and broad valley, upon the farther side of which a column of smoke beaconed the way to Soda spring and to Lambert's cabin, a warm supper and a rude couch—the latter all too poorly supplied with blankets for my weak, dispirited condition.

The Tuolumne meadows carpet the floor of the deep, even-sided nearly straight valley of the upper Tuolumne, for a space of eight or ten miles long by a half to a mile wide.

This valley is the track, the wallowing trail of an immense glacier of the olden times, and every tough, rounded rock appearing on the floor or sides, shows the grinding action of the crawling monster, many of the silicious rocks shining like glass.

Avalanches.

The sides of the valley are clothed with the luxuriant *Pinus contorta* (miscalled "Tamarack"), save where broad gaps of one-half to a mile, show where from the snow-gathering crests along the lofty rim avalanches of snow and rocks thundered down, carrying the forest with them out into the valley. Some of the avalanches occurred at recent date, how recent might be easily approximated by cutting trees upspringing in their track and counting their rings of annual growth. Others cleared the timber off their pre-emption so long ago that the forest is nearly restored, but the precise width and comparative violence of the slide can be determined by noting the hummocks of rocks and earth lying in interrupted bands along the center of the valley—telling where decayed the upturn trees.

Above Soda spring a mile or two, the Tuolumne river, clear, cold and singularly destitute of fish, divides into two branches. The east branch comes from circling around the bases of Mounts Dana and Gibbs, 11 miles distant; the south branch, called Lyell Fork, comes gliding along a valley similar to the meadows, but with still more interesting evidences of snow and rock-slides. At the south end the walls close in and the water comes from two sources, cascading down a precipice half a mile high. Leaving my faithful Stanley here securely tethered with a long rope where he could eat and drink at will, I prepared to climb the precipice in the early morning of a fine August day. The vicissitudes of a long, perilous exploration had endeared us to each other, and it was with poignant sorrow that I shouted in reply to his neighing entreaties sent lovingly after me as I clambered up the precipice.

Climbing Mt. Lyell.

As I neared the top of this precipice, I looked expectantly for the peaks of Lyell, only to find a broad, bush-covered bench, back of which a mile away, rose another precipice a half mile high. Climbing wearily up this, aided by the spirea and gooseberry shrubs clinging to the crevices of the rocks, I was encouraged by a most enchanting view of the peaks five miles away. Between lay an alpine plateau, destitute of trees, covered as late as July with snow, now partially exposed, revealing dozens of small placid emerald lakes imbedded in steep grassy banks, brilliant with rare flowers and butterflies.

The lakes with all their decorations were arranged in lines, between which rose long ridges of snow. Mounting one of these, I saw that they led back a mile to still another precipice, on the brow of which loomed the rounded, front-face of a semi-circular moraine. The region of living glaciers was near, and joyfully I hurried over snow ridges and around lakes, only occasionally snatching a flower and crowding it into my portfolio, or pinning a butterfly to my hat. I must not stop to study these wonderful phenomena now, for the noontide sun is shining hot, and the grand arcana is but entered.

"Will precipices never end," I exclaimed while pulling myself up the slippery, moss-grown rocks by laying hold of clumps of *Bryanthus Breweri*, prettiest of California heathers, so charming that I must be pardoned for stopping to observe. One bluff several hundred feet in extent, was all ablaze with crimson and orange, the blended colors of this heather and another exquisite relative, *Cassiope Mertensiana*.

At last I encountered the sharp, steep-piled rocks of the moraine. Twice in my eagerness to get up, I displaced rocks and with them tumbled to the bottom. When at length I reached the crest, tired, bruised and torn, *a scene appeared that stirred my being to its very depths!* A still, azure lake, its farther shore being filled in with a vast semi-circle of angular rocks, which was curled around the front of an immense precipice of solid blue ice 40 feet high, and reaching from wall to wall of the canyon, its steel-blue upper edge along its entire rainbow curve burdened at intervals with toppling rocks, some of them as large as dwelling houses, while beyond and over all towered the snow-striped pinnacles of Lyell.

I could not shout this time, for I was thinking of far-away friends. I could only murmur the names of each and fervently wish them there at that supreme hour!

But we must not linger here. Other startling phenomena are at hand, and we will try to study them in proper connection at the close. Now, our business is climbing. We are yet to surmount formidable and unexpected difficulties.

Turning the flank of this barrier I was soon on the back of the glacier. The snow of several seasons lies on the top, blown by the wind into ridges and melted between by the sun. Here and there evenly scattered over the surface lie rocks of all sizes and shapes, torn, as we shall see, from the pinnacles above. Hurrying over the drifts and through the streams of water partially filling the furrows, I struck out for the nearest peak. At its top a sweeping curve of sharp rock led to a higher one, and this to another. On and up I pressed, my injured back complaining sharply and almost compelling a return. The flora was singularly abundant on these extreme hights, but I could only pause for a few rare species. By mistake I first ascended Mt. McClure nearly to the top, when, by chance, I angled a little to the left, and there, a mile away to the south, across a deeply furrowed ice-field, rose the loftier peak of Lyell. My watch told me it was 1:30 P. M., and I knew I was at least 10 miles from my bivouac. But my resolution was immediately taken. I slid down an incline of splintered rocks to the ice-field, climbed over rib after rib of the hard snow nearly to the base of the shining pinnacles, before I came upon the widest crevasses of this ice-field. [One I discovered too late for my comfort. In my haste I ran up the side of a rib and sprung over to slide swiftly but without injury to the bottom of a crevasse about 12 feet deep and four wide. Here was an adventure! However, I was glad that chance thus gave me an opportunity to inspect the bottom of a glacier, after which with my ever-ready botanical pick I dug holes in the inclined lower side of the crevasse for fingers and toes, and was soon on the way again. As I gazed up the culminating peak, and saw barriers innumerable with beetling crags surmounting almost vertical walls, I became well-nigh discouraged. But around to the south side appeared a heap of talus (broken rocks), and I judged a passage of some kind must be there; so I hastened around to see. There was a passage to be sure, but what a fearful one! A soft stratum of slate rock had crumbled away from between two vertical cleavage planes of granite about six feet apart. At intervals huge blocks of granite were lodged corner-wise in this open cut, while on the bottom piles of debris formed nearly horizontal landings, where temporarily arrested a few rods apart. I at once entered this chasm, for this Appian Way was my only hope to reach the summit. But the situation was frightful, and my nerves which never blanched before, not even when charging a battery of belching cannon, now caused a tingling sensation from head to foot. I think it resulted from the injury to my back. I almost recoiled from passing under boulders that, it seemed, only a touch might dislodge.

Once the landing of debris gave way beneath my feet, and I was precipitated wildly down to the next landing, which, luckily, was strong enough to resist the shock. Having reached the top of my narrow-gauge, I found myself still several hundred feet below the summit. I had read in "Whitney's Guide," that when Clarence King climbed this peak, he was stopped when within about 150 feet of the top by a horizontal knife-edge of 12 feet long. I hoped that my short-cut came out above this barrier, but in a few minutes climb, I came upon the forbidding "knife-edge," with a sheer precipice of 1,000 feet on each side.

Resolutely clambering to it, I clasped my gloved left hand over the sharp edge, and with my pick in my right, dug niches in the side for the edge of my nailed boots, six such cuts enabling me to cross the frightful barrier. Ten minutes afterward I swung my hat triumphantly in the breeze from the highest pinnacle of Lyell, 13,217 feet above the sea!

The views on every side from this peculiarly central station are unexcelled on this coast, but as nearly the same are presented from Dana, which I am next to explore, description is omitted here to give room for promised studies of glaciers and their work, which will be the subject of my next article.

A Snake River Debate.

Saving Fine Gold.

Gold has, for years, been known to exist on the Snake river, but so fine is the gold that it is only very lately that a successful method has been applied there. "This method," says a Park City correspondent of the Salt Lake *Tribune*, "is not generally understood, even by old placer miners, who have mined for coarse gold, unless they have also worked in gold quartz mills. From the knowledge I have of Snake river, I am satisfied there is very little chance of hydraulicking. There is not fall enough, nor is the material of a nature to require that kind of force to tear the cement, clay and other tough material found in gravel diggings. So that I shall describe the process as though the water was to be pumped into the sluices:

"1. You place a line of sluice boxes, long or short, according to the nature of the material that carries the gold; if it is sand without clay or sticky material, a few boxes will be sufficient. In the lower box, before any plates are used, there should be a sheet iron lined box or long-tom, from which all the rock must be forked out, so that nothing but muddy water and fine sand passes down over the plates to be placed below.

"2. Place the boxes which contain the plates as flat as you can, and have the water and sand pass over them without clogging; the slower it passes the more gold will stop. No coarse gravel should be allowed to pass over them or the amalgam will be scratched off. If it is not, it is because it is too hard and not in proper condition to catch fine gold, or coarse either.

"Old mill men will tell you the softer the amalgam can be kept on the plates and not break and pass off, the better its condition to save gold. It is obvious, then, that coarse material should not be allowed to pass over them, and that the line of sluice boxes above should be long enough to wash clean and fork out all but the water and sand.

"3. The boxes containing the plates should be stout, and placed one below the level of the other with a drop of six or nine inches. This keeps the sand stirred up, turns it over and presents new surfaces.

"4. The length necessary to be plated can only be ascertained by actual practice. If the gold is easily amalgamated, a few feet would be sufficient. The only safe rule would be to keep adding plates below as long as any gold stops.

"5. Much has been written about silver plating. While I admit that they are the least trouble, they are *not* absolutely necessary. Take sheet copper, say an eighth of an inch thick, and scour it bright and smooth. This may be done with rotten stone, ashes and soap, or other material that will not scratch or indent the plate. Finish off with dilute acid, either sulphuric or muriatic, by three parts of water to one of acid. This should be kept in a porcelain kettle, to apply to any spot where the amalgam rubs off and the copper shows through. Add to the above solution a little cyanide of potassium.

"6. Now, to amalgamate your plates, get some good silver or gold amalgam, which does not contain much base metal. You can tell this by the feel—if base, it will be greasy and stain the fingers, if pure, it will squeak when pinched, and will not soil the hands. Soften this with quicksilver, and rub once over the plate at first quite softly. When the surface shows like a silver plate, add more dry amalgam and go over again until a coating adheres that can be rubbed off with a piece of belting, either leather or rubber; and, by the way, this is the only scraper that should be used until the plate is thoroughly and permanently amalgamated.

"If the above directions are followed, a plate will be produced that no speck of gold on Snake river can tell from a silver plate, and will not pass over it to meet one. Sheet copper can be found almost any place where quartz mills are operating, and can be prepared by miners themselves. The delay and expense of sending for silver plated ones is beyond the means of most prospectors. A well amalgamated copper is as good and will save as much gold as a silver plate. The difference is, that the amalgam comes off of copper in spots where much splashing or friction exists, as in the inside of batteries, etc., but in sluice boxes, with a uniform body of water passing over them, and close watching to keep them amalgamated, I think they will be found good enough."

In the columns of the same paper, "Snake Bite" thus challenges "'49er." The latter, he says, is correct in stating that silver-plated copper plates are not absolutely necessary in sluice mining. He is "open to correction, however, in regard to the instruction he gives for making the necessary appliances, setting the boxes and preparing the copper plates.

"1. It is not necessary in the new machine, to fork out the coarse rock, as he states, it would cost too much.

"2. He is in error when he directs to 'place the boxes as flat as you can' to catch fine gold. The finer the gold the steeper the boxes should be set, as the sand will pack in a box with little inclination, and the fine gold will not work its way to the bottom.

"3. While I agree with him that silver plating is less trouble, it is not absolutely necessary, but his directions for amalgamating will produce the very results that silver plating is designed to prevent, to wit: the oxidation of the copper and the consequent discoloration of the plates. No acid should be used; and the plates can be amalgamated without it if you know how (there is the rub), and be as efficient as if plated with silver.

"Miners are beginning to realize that placer mining can be improved upon as well as mill processes, and the new mode of working, I have no doubt, will result in the output of millions of dollars in the region of country along and near Snake river.

Gold Sands.

The following paper was read before the California State Geological Society: A short time ago a gentleman having a patent for the use of petroleum as fuel in making iron and for the smelting of lead and other ores, called at the rooms of this society for information as to the situation, extent and richness of the iron mines of this State. Our worthy Secretary, Mr. Heydenfeldt, after having put him in possession of the required information, gave him a letter of introduction to me. At the time he called to deliver it, I was reading Mr. J. H. Godfrey's paper on the geology of Japan, published in our *Quarterly Journal*, August 1st, 1878, wherein he says: "About two-thirds of the whole production of iron in Japan is derived from the treatment of the sand of magnetic iron ore. The principal deposits of this iron sand are found along the eastern and southern shores of the main island (Nippon), and usually they appear to have been derived from the decomposition of the neighboring granitic rocks."

In another place he says: "Sand of magnetic iron ore undoubtedly derived from the adjoining volcanic and metamorphic rocks, is frequently met with along the seashore and largely used for manufacturing an excellent quality of iron, as for instance at Nakayama, Province of Gueshin." Having the facts in my mind, I suggested to Mr. Eames to make a trial of the magnetites, in our gold sands, which are to be found in such quantities on this coast, the condition of such ore being, as I conceived, so well adapted for the flame from petroleum. Mr. Eames, I am pleased to say, is now erecting a trial furnace at old Saucelito, and I feel very sanguine as to the results. I make no doubt but what he will be able to manufacture the shoes, dies, etc., required for our quartz mills direct from the ore. If the ore is obtained from our gold sands two dollars per ton should pay for concentration, leaving the gold for profit. Manufactures of this kind, giving employment to so many, ought to receive every encouragement. The fuel and ore exist in abundance on this coast, and also the best market for the manufactured article, which in reality only requires labor to produce it.

I have had a number of samples of sand sent to me from the beach near the Ocean house. The first I tried yielded at the rate of $5 per ton for gold, and contained about 25% of magnetite, with some chrome. The others gave about 50 cents per ton for gold, and from 15% to 65% of magnetite. The concentration, I imagine, would be a very simple affair, but the ore should be made as clean as possible, and ought to contain at least 90% of magnetite. Two of Bunton's ore dressing frames would, I think, do the work of concentration very well. The prepared canvas of the first frame should revolve more rapidly than when used in dressing lead ore, and have a slight percussion movement added to it, the strength of the blow from which ought to be so arranged that the person attending the frame could vary it to suit the work. The second frame should have the prepared canvas covered at intervals with silvered plates, and be worked slower than the other frame, and so placed that the partially dressed ore from the first could pass over it.

Mr. A. exhibited drawings of two gold-washing machines which were used 200 years ago with direction of how they were worked; also, a diagram and description of Brunton's ore dressing frames, published in the London *Mining Journal*, in 1846, and ore by himself for treating lead and copper slimes, also published in the London *Mining Journal*, 1843, and one cut out of the MINING PRESS of San Francisco last week.

The use of petroleum as a fuel bids fair to revolutionize all our smelting operations, and it will not be long before it will take the place of coal in the treatments of copper, silver, lead, and other ores, even in the calcination and distillation of zinc; but by far the most important will be in iron making, particularly in the puddling furnace. Where a constant and high temperature under perfect control is required, it will take the place of everything else—indeed, the only limit to its use, I think, will be its cost.

MECHANICAL PROGRESS.

Iron in Car Construction.

Much thonght and labor has been expended in the construction of railroad cars, to obviate the necessity of carrying such a large proportion of dead weight, as has hitherto been considered necessary, whether for passengers or freight; any improvement which will bring about a favorable change in the ratio between dead load and carrying capacity must be of proportionate value. Mr. Albert F. Hill, of Cincinnati, recently read a very interesting paper on this subject, at a meeting of the Master Car Builders' Association, from which we extract as follows:

Remembering that the same mechanical principles which govern the design and construction of a bridge hold equally good in the construction of a roof or a warehouse floor, etc., there can be no impropriety in considering a freight car-body as a perambulating bridge, or a bridge on wheels. Conceding this view of the subject to be tenable, it will not be difficult to determine the proper principles which should *govern* and the proper materials which should *enter into* the construction of freight cars.

The tendency to substitute iron for wood in engineering and architectural structures has of late years steadily increased, until at the present time the wooden railroad bridge has become the exception and the iron bridge the rule, and it will not be long before steel will supersede the iron in large spans. In our cities, iron buildings or stone buildings with iron doors supersede every year more and more brick and wood. Durability, strength, lightness and elegance of construction, as well as true economy, are the principal qualities by which metallic structures commend themselves.

Applying this to car construction, I think the point of greater, in fact considerably greater, durability will be readily conceded. Unfortunately, no reliable or rather *positive* information as to the life of freight cars seems obtainable, under our present system of freight service, and the continual interchange of cars over the different lines. Still, barring accidents of course, it will be safe to assume the life of a car-body to vary from eight to ten years at the most. There are some few instances of greater durability on record, but mostly on roads which have but little freight traffic and less interchange over other roads. The life of a metallic car, on the other hand, may safely be estimated at from 35 to 40 years.

In order to illustrate his views, Mr. Hill instituted a minute comparison between the best constructed ordinary wooden-box freight cars, and the iron car which he proposed. He dissected the wooden car piece by piece, giving the weight and strength of each, and then rebuilt the same car with iron wherever that metal could be introduced. We have not the space to go into the particulars of this illustration, and can only give his conclusions, which were summed up as follows:

I have made a rough calculation of the weights in that car, and I get the following results (some of these are accurately calculated and others only approximately, but near enough for all practical purposes): I get two trusses weighing 1,680 lbs.; rolled and wrought iron, 1,760 lbs.; cast iron, 300 lbs.; wood, nearly 4,000 lbs. I think I might be able to do it with considerably less wood yet, but I have assumed the same floor system that is in this car, and that, with the end oak timbers and buffer blocks, and some inside lining, runs up to 4,000 lbs.; and of sheet iron, 2,260 lbs., making a total of 10,000 lbs. Now this car stands thus: Approximate weight of body, 10,000 lbs.—and the weight of the car will fall within that; it can be constructed with less; then for two trucks, 8,700 lbs., making a total of 18,700 lbs. for the whole car ready for use, with a carrying capacity of 20 tons. The wooden car which has served in its general dimensions and general arrangements as a model for this metallic car has a carrying capacity of 12 tons, and a total weight of 22,000 lbs. Granting that this wooden car when new and in good condition, can carry 15 tons, though I think that this is the maximum that ought to be put in that car, we have increased the carrying capacity 25% and reduced the dead weight nearly the same amount.

That a metallic car constructed as this is, will effect such savings as indicated here, is open to the calculation of every one of you. There is no difficulty in calculating these strains and in getting the amounts of metal that are necessary for those strains.

The above-mentioned of gain in weight and capacity, it will be observed, is calculated for a car of the ordinary size of wooden cars; but Mr. Hill proposes to add greatly to the length of the cars when made of iron—or what would he still better, of steel. His ideal metal car would be at least 45 feet long, built upon the principle of the truss bridge. Indeed he calls his car "a bridge on wheels."

Where the real saving in metallic cars will come in will be by lengthening them out, and lengthening them out considerably. With every foot that you add, you will not only increase your carrying capacity, but, if you will go far enough, you will not only increase your carrying capacity for that foot, but you will decrease dead-weight in still greater proportion. This car [the small metal car built of the same dimensions with the wooden box car of which he had been speaking] is altogether too light a car to employ steel in sufficiently large quantities in it; but get a truss 45 feet long and give that car a carrying capacity of at least 40 tons, and you can take advantage, in almost every member of that truss, of the greater tensile and compressive strength of steel.

Testing Boiler Iron.

The following is from a late report of a Government official on the important matter of boiler inspection. It is evidently necessary that a positive and generally accepted rule be established for deciding this important matter. It is believed that the efforts now being made by this office, and supported actively by manufacturers generally, will introduce into the market iron of American manufacture for marine boiler use, equal if not superior to that made in any part of the world, but whatever the quality of the iron the eccentric manner of its wear under steam is not yet explained. Some plates oxidize as soon as used; others of identical texture and position, wear for years without material deterioration, while others again, after wearing for several years without apparent damage, suddenly oxidize and are destroyed in a few months. This last condition was forcibly illustrated by the steamer *Magenta*, which exploded the outer shell of her steam chimney on March 23d, near Sing Sing, on the Hudson. He refers at length to the *Magenta* explosion and says: Such disasters can be avoided by frequent and careful inspection. There are places, however, in all boilers where personal inspection is impossible and where a hydrostatic test must be relied upon. I recommend to all steamboat owners the importance of demanding such tests frequently, especially when, after a season of inactivity, work is resumed; for experience proves that boilers deteriorate more rapidly while idle than when continuously used. He says that in all his efforts to improve the service he has had the cordial support of steam-vessel owners. It is true they complain that some statutes are unjust to them while affording no advantage to the public, and they are naturally opposed to being compelled to purchase worthless patents. It is not appropriate for him to discuss their wrongs, but he hopes justice may be done them, for as a class they are ready to comply with every wholesome provision of the law. Of the total number of vessels inspected, 260 belong to the Pacific coast, with a tonnage of 108,532; 1,820 to the Atlantic coast, with a tonnage of 466,757; 889 to Western rivers, with a tonnage of 186,932; 857 to the northern lakes, with a tonnage of 186,378, and 311 to the Gulf coast, with a tonnage of 68,831.

WHAT IS STEEL?—Difficulties such as these have hitherto prevented the adoption of any of the proposed nomenclatures, says Dr. Siemens, and have decided engineers and manufacturers in the meantime to include, under the general denomination of cast-steel, all compounds consisting chiefly of iron which have been produced through fusion and are malleable. Such a general definition does not exclude from the denomination of steel materials that may not have been produced by fusion, and which may be capable of tempering, such as shear steel, blister steel and puddled steel, nor does it interfere with distinctions between cast-steels produced by different methods, such as pot steel, Bessemer steel, or steel by fusion on the open hearth.

MACHINE FOR MEASURING SUPERFICIAL AREA.—Mr. J. H. Williams exhibited this fall, at the Mechanics' fair, in Boston, a very ingenious machine, which he invented, which is capable of indicating six to eight times per minute the superficial area of surfaces, however irregular, where the surface does not exceed twenty-five square feet. It can compute in less than ten seconds the square contents of a circle without reference to mathematical rules, and it is certain to find practical application in many departments of trade. It will specially be of use to leather dealers and manufacturers, for measuring exactly the superficial area of hides and skins.

THE process of Dr. de Haen for preventing incrustation in steam-boilers, which consists in the treatment of the feed-water with the proper amount of baric chloride and milk of lime, as determined by quantitative analysis, is to be employed for the 310 boilers of Krupp's steel foundry at Essen.

IMPROVEMENT IN SOLDERING IRONS.—A novel soldering iron, the invention of M. Paquelin, was recently described before the Academy of Sciences, Paris. Its distinctive feature is a platinum receptacle, in which heat is instantaneously generated with air and petroleum vapor or air and coal-gas.

CORRECTION.—In our note last week, in regard to the wire traction rope employed by the California Street railroad, the length was given 1,800 instead of 18,000 feet, as it should have been.

SCIENTIFIC PROGRESS.

Experimental Determination of the Velocity of Light.

Albert A. Michelson, of the U. S. Navy, read a paper before the American Association of Science, at its late meeting, on "The Experimental Determination of the Velocity of Light." The paper was pronounced one of the most important read before its appropriate section. Mr. M. said that but three scientists, Foucault, Fizeau, and, more recently, Cornu, have sought to experimentally ascertain the distance of the sun from the earth. Foucault used the method known as that of "Wheatstone's Revolving Mirror," the application of which was first suggested by Arago. Fizeau and Cornu both used another method, known as that of the "toothed-wheel." In Foucault's experiments the distance traversed by the light was 20 meters. The result obtained by him was 185,200 miles per second. Cornu's stations were about 14 miles apart. The result obtained by him was 186,600 miles, which exceeds the former by 1,400 miles. The objection to Foucault's method is that the displacement, which enters directly in formula, is very small, and therefore difficult to measure accurately. The objection to Fizeau's is that the total disappearance of the light was necessarily uncertain.

The object of Mr. Michelson's experiments is to increase the displacement in the first method. This can be done in several ways: (1) By increasing the speed of the mirror; (2) by increasing the distance between the two mirrors; (3) by increasing the radius of measurement, *i. e.*, the distance from the revolving to the scale. In Foucault's experiments the speed of the mirror was 400 turns per second; the radius of measurement was about one meter, and the distance between the mirrors was about 10 meters. The displacement obtained was about 0.8 millimeters. In Mr. Michelson's experiments the speed of the mirror was but 130 turns per second, but the radius of measurement was from 15 to 30 feet, and the distance between the mirrors was about 500 feet. The displacement obtained varied from 0.3 of an inch to 0.63 of an inch, or about 20 times that obtained by Foucault. With a greater distance between the mirrors and a better apparatus he expected to obtain a displacement of two or three inches and to measure it to within one-thousandth part of an inch. Tables of observation of the velocity of light in air were given by Mr. Michelson, the mean result being 185,508 miles per second.

Cast Manganese.

A late number of the *Chemical News* says that M. Jordan has presented to the French Academy a specimen of cast metal, obtained by treatment of the ores of manganese in the blast-furnace. The composition of this metal is:

Manganese	84.96 %
Iron	8.55 %
Carbon	5.70 %
Silicon	0.66 %
Sulphur	0.035%
Phosphorus	0.005%
Total	99.910%

In subsequent operations the percentage of manganese has been carried as high as 87.4%. The specimen laid before the Academy had been preserved for six months without having undergone any sensible alteration. There was noticed a considerable loss of manganese in the furnace, amounting sometimes to as much as 10%, which, with certain other facts, appears to warrant the opinion that this metal is somewhat volatile at elevated temperatures.

VEGETABLE ALBINISM.—At a late meeting of the London Chemical Society, Prof. Church read a paper entitled "A Chemical Study of Vegetable Albinism," in which numerous experiments were described and analyses presented, the conclusion arrived at by the author being that the white leaf is parasitic upon the green. Whilst the author did not give any decided opinion as to the cause of the whiteness, he remarked that white leaves are usually weaker and thinner, and that albino cuttings cannot be "struck." Some attempts have been made to stimulate albino foliage, but without any decisive results.

At the same meeting an interesting paper was read by Dr. Carnelly, on the "Relation between the melting points of the Elements and their co-efficients of expansion." Certain theoretical considerations led the author to the conclusion that the co-efficient of expansion of an element by heat would be the greater the lower its melting point. This conclusion the author has tested in the case of 31 elements, and finds that, with five exceptions, the co-efficient of expansion increases as the melting point diminishes; the five exceptions are, As, Sb, Bi, Te and Sn. A table and a graphic curve accompany the paper, which the author promises to supplement by a communication on a simple relation existing between the heat evolved by a chemical reaction and the melting points of the reacting and resulting bodies.

Barcenite—A New Antimonate.

A heavy, nearly black mineral, which has been discovered at Hitzneo, Mexico, by Senor Barcena, and to which his name has been given, has proved to be an antimonate of hitherto undescribed character, mixed with finely-divided mercuric sulphide and antimonic acid. Heated alone before the outer blowpipe flame, the mineral decrepitates slightly, turns white or nearly so, and becomes rounded (with some difficulty) on the edges, giving off a little white fume; in the reducing flame the fume becomes more abundant from reduction of metallic antimony, followed by volatilization and burning in the outer edge of the flame, which is colored greenish-blue. A fragment heated in a closed glass tube gives off water, metallic mercury, black mercuric sulphide and a very little oxide of antimony; in a tube open at both ends the whole of the mercury is deposited in the metallic state, the sulphur being burned off, and in a good draft of air through the tube more oxide of antimony is carried along and deposited. A well-marked white antimonial sublimate is produced by heating on charcoal, and if sodium carbonate be added the antimony is easily reduced to little metallic beads. The mineral in powder is largely dissolved, in the oxidizing flame by borax or microcosmic salt to a clear, colorless glass, which become turbid in the reducing flame. The mineral, even when finely pulverized, is insoluble in hydrochloric or nitric acid, though this he concentrated and at the boiling temperature. It is very slightly acted on by boiling solution of ammonium sulphide. On boiling with a strong solution of sodium hydrate, filtering, acidulating and passing in hydrosulphuric acid, an orange precipitate is obtained in no great quantity. Hydrogen passed over the powder at a red heat easily reduces metallic antimony, which can then be attacked by acids. The quantitative analysis was made by Mr. J. R. Santos, of Guayaquil, Ecuador. He obtained:

	Atom'c	Ratios.
Sulphur	2.82	.088
Mercury	20.75	.104
Calcium	3.88	.097
Antimony	50.11	.418
Oxygen (by difference)	17.61	1.101
Water { constitutional 3.50 / lost below 130° C. 1.23 }	4.73	
Silica	.10	
	100.00	

DISEASE OF CHESTNUT TREES.—The *Comptes Rendus* of the French Academy of Science contains an interesting note by M. Planchon on the subject of the disease at present prevailing among the chestnuts of the Cevennes, and which is probably identical with that noticed in the Basses-Pyrenees and in upper Italy. The chief symptom visible outwardly is the decay of the extremities of the branches, sometimes one after another, and sometimes all at once, in which latter cases the tree quickly dies, though in others it may last in a more or less diseased state for two or three years. This gradual or sudden death of the branches, M. Planchon found to be consequent on an alteration of the roots. If these be laid bare, parts of the wood and bark of the larger and middle-sized ones are seen to be softened as if by a kind of gangrene, and a fluid exudes from their tissues which, owing to its containing tannin, forms an ink with the iron in the soil, and stains the earth round about for a considerable distance. The roots thus affected, from the smallest radicles to the largest trunks, are characterized by the constant presence of a mycelium or fungus which assumes various forms, but which always appears subsequently on the trunk of the tree in the same form that it was present on the underground portion of it. It generally presents itself in the form of more or less ramified whitish-yellow strings, and is probably closely allied to the *Agaricus melleus*, which plays such havoc with fir trees.

HEAT-CONDUCTING POWER OF ROCKS.—Some time ago Prof. Herschell and M. Lebour made a series of experiments on the heat-conducting power of rocks. Twenty-eight specimens were reduced to uniform circles of five inches diameter and one-half inch thick, but of six specimens that had been tried, slate plates cut parallel to the plane of cleavage transmitted the heat faster than any of the others. Where the flow became uniform the water was raised 1° Fahr. in 32 seconds; with marble, sandstone, granite and serpentine, about 39 seconds were required to raise it by the same amount. The greatest resistance to the passage of heat was offered by two specimens of shale, gray and black, from the coal measures in the neighborhood of Newcastle, which occupied 48 to 50 seconds in raising the water one degree, or half as long again as that taken by the slate.

A QUARTZ THERMOMETER.—Quartz, by its rotary power, M. Jeannet asserts in the *Comptes Rendus*, constitutes a thermometer of extreme sensibility, fulfilling the essential condition of every thermometer, comparability. When once the apparatus is fitted up it is merely needful in order to find a temperature to read off an angle, and refer to a table calculated once for all. It may therefore be hoped that science, and even industry, may find in this new thermometer an instrument comparable to the mercurial thermometer for the simplicity of its use and the certainty of its indications. The author's experiments extend from—20 degrees to plus 840 degrees, or perhaps 1,500 degrees.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 12.		Week Ending Dec. 19.		Week Ending Dec. 26.		Week Ending Jan. 2.	
Alpha	10	8	9½	8¼	13¼	9¾	11	10¼
Alta	7¼	5⅛	6	5⅛	5⅞	5¼	5½	5
Andes	65c	40c	60c	50c	50c	40c	50c	....
Alps	25c	....	20c	....	....	....	....	....
Argenta	2.60	2.40	3	2¾	3½	2.70	2.90	2.60
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	50c	....	50c	40c	....	....	....	....
Baltimore Con	1½	1¼	1½	....	....	....	....	....
Belcher	4.90	4	4.10	3.60	3.90	3½	3.80	3½
Belmont	35c	25c	45c	30c	30c	10c	60c	10c
Best & Belcher	20¼	17½	18¾	17	18	17½	18⅛	17
Bullion	5¼	4.40	5	4½	5⅛	4¼	5⅜	4.65
Bechtel	80c	45c	60c	50c	70c	50c	70c	50c
Belle Isle	20c	15c	30c	20c	20c	....	20c	15c
Bodie	14½	12½	13½	9	12	7¾	8	7¾
Benton	4¼	2½	4.10	3	3.60	3	3½	2¼
Bulwer	16	15	16	15½	16	14	15	14⅝
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1	90c	50c	....	40c	....	....	....
Belvidere	1	20c	75c	30c	50c	30c	75c	50c
Booker	1	75c	80c	50c	50c	30c	60c	50c
Caledonia	2½	1½	2.80	2	2½	2.30	2.55	2¼
California	11	9⅛	10½	9¼	10	9¼	10½	9¾
Challenge	2	1	1.65	1.40	1.85	1½	1.70	1.60
Chollar-Potosi	40½	35	39½	33	39½	38	47½	38¼
Comanche	....	....	....	....	....	....	....	....
Confidence	9½	7½	9	7¾	9½	8¾	9¼	9
Con Imperial	75c	55c	70c	65c	95c	70c	80c	70c
Con Virginia	8½	7⅛	8	4	8¼	7¾	8¼	7¾
Crown Point	5	4	4.40	3½	3.80	3.60	3.65	3.45
Con Washoe	2.90	2½	3½	2.10	....	....	....	....
Champion	15c	5c	25c	15c	15c	10c	40c	30c
Concordia	....	....	50c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	15c	20c	15c	15c	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	30c	25c	25c	....	30c	....
Eureka Con	37	34½	36	34	33½	32	32	31
Exchequer	4.10	3¼	3.90	3¼	4.40	3.60	4.40	4
Endowment	30c	10c	20c	10c	40c	10c	35c	20c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	8⅝	8¼	8¾	7¼	9½	7¾	8⅛	7⅞
Gila	25c	15c	....	....	....	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	6	5¾	6	....	6	5½	5¾	....
Goodshaw	50c	30c	50c	40c	40c	30c	40c	30c
Gould & Curry	8¾	7⅞	8⅝	6¾	9¼	8½	9¼	8⅜
Hale & Norcross	12	10¼	11⅛	9⅜	11¾	10	12¼	10⅝
Hillside	3½	2¼	2.60	2¼	2¼	2	2½	2
Highbridge	2½	2.10	2.30	2⅛	2.35	2¼	2.40	2¼
Homestake	15	....	....	....	....	....	....	....
Hussey	40c	30c	30c	....	35c	30c	35c	....
Independence	1.30	1½	1.45	1.30	1.30	1¼	1¼	1.20
Julia	4.60	2½	3.80	2.90	3	2.90	5⅜	2⅝
Justice	4¾	3.90	4½	3.90	4	3¾	3¾	3½
Jackson	7¾	6	9¼	7	9½	8½	7¼	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	1½	....	....	....	....	....	....	....
Kentuck	4¾	4	4½	3¾	4½	3.70	3.90	3.70
Kossuth	15c	....	20c	15c	20c	15c	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	2.10	1½	1.95	1.05	1.05	75c	90c	50c
Lady Wash	1½	1	1.10	90c	1	90c	80c	70c
Leopard	1.20	1	1½	1	1	....	1	....
Leviathan	50c	35c	40c	30c	40c	30c	50c	35c
Leeds	1¼	1	1.20	1	1½	1.15	1½	1¼
Lee	....	....	....	....	....	....	....	....
May Belle	50c	40c	50c	....	50c	....	50c	....
Modoc	15c	5c	....	....	....	....	60c	....
Manhattan	4½	4.15	4½	4	4.15	4	4½	4
Martin White	7½	6	4½	3	6	4½	5	....
McClinton	50c	....	60c	50c	50c	40c	40c	....
Meadow Valley	....	....	35c	30c	....	....	20c	....
Mexican	28½	22¾	29½	27	31½	27¾	31	28
Mides	1½	....	....	....	....	....	....	....
Morning Star	3	2½	2½	....	....	....	2½	....
North Con Virginia	6½	4	7½	4	5¼	4	5¼	4¼
New York	55c	40c	70c	60c	85c	60c	65c	55c
Northern Belle	9⅝	9¼	10	9½	10	9¾	10	9⅜
New Coso	35c	....	30c	25c	25c	20c	....	....
Navajo	50c	40c	50c	45c	50c	40c	45c	40c
Occidental	....	....	1	....	....	....	....	....
Ophir	43½	34	42	36½	38⅜	37	36	33⅜
Oriental	30c	25c	30c	15c	75c	60c	65c	....
Overman	11	9⅝	10½	9	10½	9⅜	9⅞	9⅛
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	55c	45c	40c	30c	40c	30c	30c	25c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	9½	7¼	10½	8	9⅝	6½	8⅞	7½
Richer	....	....	30c	25c	75c	60c	50c	40c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11	9¾	10	9	9⅞	8¾	10½	9⅛
Seg Belcher	20	18	20	....	20	18	18	17
Sierra Nevada	51½	39	51¼	46	48	44½	43½	37½
Silver Hill	1¾	1	1½	1¼	1.65	1¼	1½	1.30
Silver King	12	....	....	....	....	....	10	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	85c	65c	65c	50c	40c	25c	25c	20c
Summit	1¼	1.10	1¾	1.05	1.15	1	1.30	80c
Scorpion	1¼	1	1¼	90c	1.15	1	1	50c
Solid Silver	50c	....	60c	....	50c	....	50c	....
South Bodie	....	....	45c	40c	....	....	....	....
South Standard	40c	25c	30c	25c	30c	25c	25c	....
Star	40c	25c	50c	....	50c	25c	50c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	2	1¾	1½	....
Tioga Con	1¼	1.10	1.60	1¼	1¼	1	1¼	1
Tiptop	1½	1.30	1½	1¼	1½	1.35	1.40	1¼
Trojan	30c	25c	30c	25c	30c	25c	30c	25c
Union Con	60	38½	61	54½	59⅜	55¼	58	52
Utah	16½	13	15	12⅝	13½	12½	11⅜	10⅜
Vermont Con	....	....	....	....	....	....	....	....
Ward	1¼	50c	75c	55c	60c	50c	1¼	50c
Wells-Fargo	35c	25c	25c	20c	20c	10c	20c	15c
Woodville	25c	20c	25c	20c	25c	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15	11⅞	16	13½	15	14	14⅝	13¼

Sales at S. F. Stock Exchange.

Friday A. M., Dec. 27.

260 Alta....5½@5¼
820 Alpha....11@10½
180 Best & Belcher..17½@17⅝
935 Bullion....4¾@4.65
520 Belcher....3.60@3½
300 Benton....3¾@3.10
490 Con Virginia....7¾
485 California....9⅝@¾
20 Chollar....39
315 Crown Point....3.60
2840 Con Imperial....80@70c
320 Caledonia....2½@2.55
100 Confidence....9@9½
100 Challenge....1.60
200 Dardanelles....1
1170 Exchequer....4@4.05
460 Gould & Curry....9½@9
80 Hale & Nor....11
150 Justice....3.60
170 Julia....2.90@2.85
750 Kentuck....3.80@3.90
400 Kossuth....15c
50 Lady Wash....80c
1650 Lady Bryan....50c
650 Leviathan....35@40c
620 Mexican....28½@29
50 North Con Vir....4½
805 N Bonanza....80@75c
225 New York....65c
160 Overman....9⅞@9½
315 Ophir....35½@35
15 Seg Belcher....18
600 Succor....25c
400 Sierra Nevada....42@41½
45 Savage....9¼
295 Silver Hill....1.30
100 Solid Silver....50c
110 Scorpion....90c@1
400 Trojan....25c
870 Union Con....54@55
115 Utah....11¾@11¼
300 Wells-Fargo....20c
100 Woodville....25c
65 Ward....55@50c
410 Yellow Jacket....14½@14⅜

AFTERNOON SESSION.

740 Argenta....2.90@2⅞
100 Bechtel....70c
20 Bodie....8
730 Belmont....10c
300 Belle Isle....20c
115 Bulwer....15
430 Booker....40c
100 Champion....30c
200 C Pacific....1⅝
400 Caledonia (B H)...1⅜@1¼
400 Day....30c
1300 Dudley....1.10@1
225 Eureka Con....31
750 Endowment....35c
350 Goodshaw....40@35c
200 Hussey....35c
1000 Highbridge....2½
50 Hamburg....1¼
830 Independence....1¼
15 Jackson....7
100 Leopard....1
75 Leeds....1¼
50 Manhattan....4
50 Modoc....60c
150 McClinton....40c
200 Mono....2.40@2½
1345 Navajo....40@45c
575 Paradise....2
725 Raymond & Ely....7½@8
100 Richer....50c
285 Summit....90@80c
60 S Standard....25c
100 Syndicate....1½
100 Star....50c
50 Silver King....10
185 Tiptop....1.40@1¼
300 Tioga Con....1.20@1¼

Saturday A. M., Dec. 28.

230 Alpha....10½@10⅝
330 Alta....5½@5¼
630 Argenta....2.60
370 Best & Belcher...17@17¼
1040 Bullion....5@4.95
100 Belcher....3.60@3.55
145 Bodie....8
605 Benton....3@2.90
140 Con Virginia....7¾
585 California....9¾
30 Confidence....9¼
20 Chollar....38¾
170 Crown Point....3.55
1150 Con Imperial....75@70c
265 Challenge....1.60
150 Caledonia....2½@2.40
95 Con Pacific....1.60@1½
140 Dudley....1
250 Exchequer....4
285 Eureka Con....31½@31
200 Endowment....30c
170 Flowery....15c
405 Gould & Curry....8⅞@8¾
315 Grand Prize....8@7⅞
100 Goodshaw....30c
210 H & Norcross....10⅞@10⅝
100 Highbridge....2.40
100 Hillside....2
200 Independence....1.25
460 Justice....3¾@3.60
990 Julia....2¾@2.80
200 Jackson....7¼
50 Kentuck....3.70
50 Leeds....1½
655 L Bryan....70@90c
225 Leviathan....40c
1590 Mexican....28@29¼
250 May Belle....50c
40 Mono....2¼
25 Modoc....60c
100 New York....55c
110 N Con Vir....4¼
180 N Bonanza....75c
100 Navajo....40c
660 Ophir....35@36
220 Overman....9¼@9⅝
100 Phil Sheridan....30c
50 Paradise....2
560 Raymond & E....8
300 Savage....9½@9¼
130 Succor....20c
10 Seg Belcher....18
2445 Sierra Nevada....39@37¼
50 Solid Silver....50c
270 Scorpion....1
100 S Standard....25c
25 Tiptop....1.30
2355 Union Con....52@55¼
60 Utah....11½@11⅝
100 Ward....55c
100 Wells-Fargo....20c
330 Yellow Jacket...13¾@13¼

Monday A. M., Dec. 30.

250 Alta....5¼
200 Andes....50c
120 Alpha....10¾@11
75 Best & Belcher....17¾
310 Belcher....3½@3.60
1270 Bullion....5@4.90
130 Benton....2½@2.60
220 California....9¾@9¼
305 Con Virginia....7⅛@7½
340 Crown Point....3½@3.45
130 Con Imperial....80c
285 Chollar....39@41½
270 Challenge....1.70
120 Caledonia....2.40@2½
100 Confidence....9
585 Exchequer....4@4¼
150 Flowery....15c
310 Gould & Curry....8¾@8½
70 Hale & Nor....11
440 Justice....3½@3.60
2695 Julia....4¾@4.85
200 Kossuth....15c
240 Kentuck....3.70@3.90
400 Lady Bryan....65@55c
200 Leviathan....40c
855 Mexican....30½@29¾
500 N Sierra Nevada....5c
170 North Con Vir....5
100 N Bonanza....75c
250 New York....65@60c
625 Ophir....36@34½
100 Overman....9⅞@9⅛
100 Solid Silver....50c
80 Scorpion....1
140 Savage....9¾
525 Sierra Nevada....39½@38¾
350 Silver Hill....1.40@1.35
300 Senator....10@20c
270 Utah....10⅞@11
665 Union Con....54@54½
500 Wells Fargo....15c
2820 Ward....1@1.05
390 Yellow Jacket....13½@13¼

AFTERNOON SESSION.

700 Argenta....2.65@2⅝
105 Bodie....8@7⅝
160 Bulwer....14⅝
205 Belvidere....50c
50 Belmont....60c
1030 Bechtel....50@60c
300 Belle Isle....20c
60 C Pacific....1½
220 Dudley....1
219 DeFrees....10c
220 Eureka Con....31@31¼
650 Endowment....35@30c
100 Golden Terra....5¾
150 Grand Prize....7⅞
200 Goodshaw....40c
100 Hillside....2¼
450 Highbridge....2.30@2¼
520 Independence....1¼
300 Manhattan....4@4.10
140 Mono....2¼
135 Martin White....5
50 Meadow Valley....20c
895 Navajo....40c
100 Oriental....65c
1570 Paradise....2@1.90
195 Raymond & Ely....8
100 Richer....40c
150 Summit....1@1.05
200 South Standard....25c
100 Tiptop....1.30
1090 Tioga....1¼@1

Tuesday A. M., Dec. 31.

360 Alpha....11@10¼
385 Alta....5¼@5
890 Argenta....2.70@2.65
400 Best & Belcher...17⅞@18¼
140 Belcher....3.60@3.70
2355 Bullion....5⅜@5⅜
180 Benton....2.90@3
80 Belvidere....75c
285 Bodie....7⅞@7⅝
100 Bechtel....60c
100 Booker....50c
600 Belle Isle....15@20c
50 Belmont....60c
50 Champion....40c
100 C Pacific....2.40
410 California....10@10¼
310 Caledonia....2.40@2.45
380 Con Virginia....7⅞@8
800 Con Imperial....80@75c
410 Chollar....47@47½
830 Crown Point....3.60@3¾
145 Confidence....9
300 Challenge....1.65@1.60
200 Dardanelles....1.10
350 Dudley....1
385 Exchequer....4.40@4.35
110 Eureka Con....31½@32
150 Endowment....36c
50 Flowery....25c
570 Gould & Curry....9@9¼
905 Grand Prize....8@8¼
280 Highbridge....2¼
460 H & Norcross....11½@12¼
100 Hillside....2.10
110 Independence....1¼@1.20
800 Justice....3⅞@3.80
1095 Julia....5@5⅜
10 Kentuck....3.90
300 Kossuth....20c
735 Lady Bryan....70@65c
900 Leviathan....40@45c
160 Leeds....1.30@1¼
150 Mono....2½@2¼
535 Mexican....30½@30¼
350 McClinton....40c
220 Manhattan....4¼
500 Northern Belle....9⅞@10
200 New York....60c
250 N Bonanza....75c
530 N Con Virginia....5¼@5
715 Ophir....35⅞@35
135 Overman....9¾
620 Paradise....2@1.95
100 Phil Sheridan....30c
70 Raymond & Ely....8⅜
650 Sierra Nevada....43@43¼
685 Savage....10@10¼
20 Seg Belcher....18
560 Senator....10@20c
100 Solid Silver....50c
160 Scorpion....50c
530 Silver Hill....1½@1.40
200 Succor....25c
140 Summit....1.30@1¼
300 Trojan....30c
295 Utah....10¾@11
395 Union Con....57¼@57⅛
100 Ward....1¼
220 Yellow Jacket....14

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Dec. 27.

610 Andes....40@50c
100 Alta....5¾
145 Alpha....12½@13¼
160 Best & Belcher..17⅛@17¼
785 Bullion....5⅛@5¼
160 Belcher....3.80@3.90
375 Benton....3
100 Caledonia....2¼
1680 Con Imperial....95@90c
275 California....9⅞@10
200 Challenge....1.70@1¾
850 Con Virginia....7¾@8
20 Confidence....9½
65 Chollar....39¾
195 Crown Point...3.70@3.80
960 Exchequer....4.15@4.40
400 Gould & Curry....9½@9¼
120 Hale & Nor....11⅞@11¾
135 Justice....3.90
80 Julia....2.90
200 Kentuck....4@4¼
100 Lady Wash....90c
45 L Bryan....75@80c
195 Mexican....30½@30¾
270 New York....60@65c
200 N Bonanza....70@80c
1060 Ophir....37½@37
120 Overman....9⅞@10
990 Sierra Nevada....44½@45¼
510 Savage....9½@9⅝
25 Silver Hill....1.35
85 Succor....25@35c
300 Solid Silver....50c
175 Union Con....57½@58
110 Utah....12½@12⅝
150 Wells-Fargo....15c
250 Ward....60c
600 Yellow Jacket....14⅞@15

AFTERNOON SESSION.

650 Argenta....2.65@2⅝
300 Belle Isle....20c
145 Bodie....8½
250 Black Hawk....40c
900 Booker....50@60c
100 Bulwer....14½
50 Champion....15c
25 C Pacific....2
230 DeFrees....15c
500 Dudley....1
145 Eureka Con....31@31¼
600 Endowment....35c
440 Grand Prize....7⅞@8
450 Goodshaw....35@40c
50 Hussey....30c
50 Hamburg....1
950 Highbridge....2¼@2.30
370 Independence....1¼
200 Jackson....7@7½
160 Manhattan....4
250 Modoc....60c
440 Martin White....6
180 Mono....2.40@2½
50 Northern Belle....9½@9⅞
300 Navajo....45c
300 Oriental....65@70c
500 Paradise....2
480 Raymond & Ely....8@9½
145 Summit....90c
50 Syndicate....1⅞
100 Sitting Bull....50c
100 S Bodie....25c
200 S Standard....20@25c
25 Tioga....1.05
590 Tiptop....1¼@1.40
900 Tuscarora....10c
100 University....75c

Thursd'y A. M., Jan. 2.

110 Alpha....10½
605 Alta....5@5¼
90 Best & Belcher....18
390 Belcher....3⅞@3.80
2145 Bullion....4.80@5
295 Benton....2.90@3
1790 California....10⅞@10½
1185 Con Virginia....7¾@8¼
360 Crown Point...3.60@3.65
80 Chollar....44@45
75 Con Imperial....80c
310 Confidence....9
40 Caledonia....2.40
100 Challenge....1.65
300 Dardanelles....1.10
225 Exchequer....4.20
95 Gould & Curry....9@9¼
155 Hale & Nor....11½
585 Justice....3.65
2110 Julia....4.70@4.90
20 Lady Wash....70c
100 Lady Bryan....70c
1075 Leviathan....45@50c
100 Morning Star....2½
355 Mexican....30½@31
400 New York....60c
850 N Bonanza....30@50c
100 North Con Vir....5¼
190 Ophir....35@35¼
130 Overman....9¼
1200 Phil Sheridan....25c
305 Sierra Nevada....41@42
415 Savage....9⅞@10
200 Succor....20c
5 Seg Belcher....17
500 Senator....15c
1580 Silver Hill....1½@1⅝
350 Scorpion....50c
140 Solid Silver....50c
200 Trojan....30c
350 Union Con....57½@58
60 Utah....11
1335 Ward....95c@1
260 Wells-Fargo....35c
30 Yellow Jacket....13⅜

AFTERNOON SESSION.

1229 Argenta....2.65@2.70
1230 Bulwer....14
310 Bodie....7⅞@7⅝
850 Bechtel....60c
100 Belmont....60c
200 Booker....50c
100 Belvidere....50c
25 C Pacific....1½
100 Day....25c
160 Dudley....1
380 DeFrees....15c
365 Eureka Con....32
660 Goodshaw....35@40c
630 Grand Prize....8¼@7⅝
5 Golden Terra....6
100 Hussey....25c
250 Highbridge....2¼
175 Independence..1.10@1.15
150 Jackson....18
210 Leopard....60c
500 Leeds....1¼
900 Mono....2¼
200 Manhattan....4¼
45 M White....4¼
100 Modoc....55c
235 Northern Belle....9⅝@9⅞
230 Oriental....65@75c
800 Paradise....2
100 South Standard....20c
400 Summit....1½@1.35
100 Sitting Bull....50c
100 Star....50c
250 Tioga Con....1.10@1.20

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journal

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	13	1 00	Dec 10	Jan 13	Jan 31	W H Watson	302 Montgomery st
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belmont M Co	Nevada	19	50	Nov 27	Jan 3	Jan 27	J W Pew	310 Pine st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Benton Con M Co	Nevada	1	50	Dec 11	Jan 15	Feb 3	W H Watson	302 Montgomery st
Bullion M Co	Nevada	8	1 00	Dec 3	Jan 7	Jan 29	Joseph Gruss	418 California st
Caledonia S M Co	Nevada	25	50	Nov 15	Dec 20	Jan 10	R Wegener	414 California st
Champion M Co	California	1	25	Nov 22	Dec 27	Jan 16	Jno Crockett	203 Bush st
Crown Point G & S M Co	Nevada	36	1 00	Dec 12	Jan 16	Feb 6	James Newlands	203 Bush st
Endowment M Co	Nevada	2	25	Nov 21	Dec 30	Jan 21	R H Brown	327 Pine st
Equitable T & M Co	Utah	19	05	Nov 7	Jan 2	Jan 21	S Healy	45 Merchant's Ex
Gila Con M Co	Arizona	3	03	Oct 17	Nov 18	Jan 9	W J Pettigrew	419 California st
Gould & Curry S M Co	Nevada	34	1 50	Nov 18	Dec 23	Jan 14	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	60	50	Dec 10	Jan 15	Feb 7	J F Lightner	58 Nevada Block
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Modock Con M Co	California	7	50	Nov 14	Dec 23	Jan 13	J W Pew	310 Pine st
North Bonanza M Co	Nevada	1	50	Dec 6	Jan 10	Jan 28	W W Stetson	309 Montgomery st
North Con Virginia M Co	Nevada	14	1 00	Nov 21	Dec 27	Jan 17	G C Pratt	309 Montgomery st
Real del Monte M Co	Nevada	4	1 00	Oct 15	Nov 25	Jan 6	C V D Hubhard	312 California st
Savage M Co	Nevada	36	1 00	Dec 4	Jan 7	Jan 27	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	G R Spinney	310 Pine st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 21	Feb 13	W H Lent	327 Pine st
Tuscarora M & M Co	Nevada	2	05	Nov 13	Dec 19	Jan 13	M E Sperling	309 California st
Vermont Con M Co	Nevada	2	15	Dec 7	Jan 9	Jan 29	E F Stone	306 Pine st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Arizona S M Co	Nevada	4	1 00	Dec 9	Jan 13	Feb 3	W Willis	309 Montgomery st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Jan 28	B S Kellogg	306 Pine st
Buckeye G & S M Co	Nevada	19	50	Nov 25	Dec 27	Jan 16	C A Sankey	331 Montgomery st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Challenge Con M Co	Nevada	1	20	Nov 22	Dec 23	Jan 14	W E Dean	203 Bush st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Colorado River C & G M Co	Arizona	3	50	Nov 29	Jan 2	Jan 18	H A Whiting	211 Sansome st
Concordia M Co	California	1	10	Oct 31	Dec 5	Jan 7	G A Holden	310 Pine st
Dudley M Co	California	1	25	Nov 1	Dec 5	Jan 6	E C Masten	22 Nevada Block
Eagle S M & M Co	Nevada	11	10	Nov 30	Jan 7	Jan 28	R H Brown	327 Pine st
Father DeSmet Con G M Co	Dakota	2	1 00	Nov 13	Dec 18	Jan 15	T Widmann	404 Montgomery st
Florence B G M Co	California	2	03	Nov 12	Dec 17	Jan 7	F A McGee	32 Merchants' Ex
Hazard Gravel M Co	California	2	06	Dec 9	Jan 8	Jan 24	J T McGeoghehan	318 Pine st
Lodi M Co	Nevada	1	25	Nov 20	Jan 7	Jan 27	O J Humphrey	328 Montgomery st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	316 Pine st
Maybelle Con M Co	California	1	15	Oct 31	Dec 5	Jan 7	G A Holden	310 Pine st
Magalia G M Co	California	1	10	Nov 22	Dec 27	Jan 16	T A White	113 Leidesdorff st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Jan 12	Jan 29	A C McMeans	24 Safe Deposit Build
Mineral Fork M & S Co	Utah	1	02	Oct 31	Dec 7	Jan 30	Otto Metchke	328 Montgomery st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 5	J Pentecost	511 California st
Oriental Con G & S M Co	California	1	50	Nov 19	Dec 23	Jan 13	F C Mosebach	327 Pine st
Orion M Co	California	4	25	Dec 12	Jan 13	Jan 28	P Conklin	28 Sansome st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
Queen Bee M Co	California	1	25	Dec 2	Jan 6	Jan 27	T A White	113 Leidesdorff st
South Utah M Co	Nevada	1	05	Nov 18	Dec 21	Jan 7	C S Healy	45 Merchants' Ex
Summit M Co	California	6	05	Nov 19	Jan 6	Feb 4	J W Clark	318 Pine st
Summit G M Go	California	1	50	Nov 27	Jan 6	Jan 23	W H Lent	327 Pine st
Tiger M Co	Arizona	2	1 00	Oct 21	Dec 10	Jan 20	W H Lent	327 Pine st
Wall Street Q M Co	California	4	10	Nov 23	Dec 28	Jan 15	D K Tripp	401 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	Nevada	R H Brown	327 Pine st	Annual	Jan 13
Bullion M Co	Nevada	Joseph Gruss	418 California st	Annual	Jan 9
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 15
Con Virginia M Co	Nevada	A W Havens	309 Montgomery st	Annual	Jan 9
Eagle C & S M Co	California	F W Utter	112 Leidesdorff st	Annual	Jan 6
Eldora G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 7
Gila S M Co	Nevada	W W Parrish	328 Montgomery st	Annual	Jan 13
Griffith Con M & M Co		G M Condee	330 Pine st	Annual	Jan 7
Henrietta Gravel M Co	California	F Klosterman	cor Kearny & Post sts	Annual	Jan 10
Iowa M Co		J H Leonard	607 Kearny st	Annual	Jan 14
Lida G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 7
Manhattan Coal M Co		Henry Jung	306 Market st	Annual	Jan 14
Mastadon G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 7
Natoma W & M Co		H P Livermore	531 Market st	Annual	Jan 21
Nevada Chief G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 7
Nevada Gravel M Co	California	J Pentecost	511 California st	Annual	Jan 14
Northern Light G & S M Co	California	F S Monroe	419 California st	Annual	Jan 6
Peacock Mountain S M Co		E B Partridge	306 Clay st	Annual	Jan 9
Raymond & Ely M Co	Nevada	J W Pew	310 Pine st	Special	Jan 28
Sierra Nevada S M Co	Nevada	W W Stetson	309 Montgomery st	Annual	Jan 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Dec 14
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Dec 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Dec 12

California Board—Latest Sales.

Tuesday A. M., Dec. 31.

40 Alpha....11
55 Alta....5½@5¼
500 Ætna....5c
50 Alexander....11½
200 Argenta....2.80
100 Almaden Q....1¼
900 Atlas....12½c
115 Belcher....3½@3⅝
100 Best & Belcher....17@17¼
65 Bullion....5⅜@5¼
10 Bodie....8
85 California....9⅝@10
100 Coso Con....5c
80 Con Virginia....7⅞@7⅞
300 Con Imperial....80c
50 Crown Point....3¾@3⅝
60 Exchequer....4¼@4¼
100 Enterprise....1¼
140 Goodshaw....30c
60 Gould & Curry....8¾@8⅞
70 Hale & Nor....10⅝@10¼
315 Julia....5@5⅛
50 Mexican....31@31¼
1060 Mint....18@19c
100 North Carson....12½c
150 New York....62½c
500 North Sierra Nev....5c
100 N Scorpion....30c
50 Ophir....36@36¼
10 Savage....9¾
50 Sierra Nevada....41@41¼
300 Senator....25c
100 Silver Hill....1⅜@1.36
200 Tiger....50c
300 Trojan....28@27c
1000 U Flag....1c
70 Union Con....56@56¼
40 Yellow Jacket....13⅝

Pacific Board—Latest Sales.

Tuesday A. M., Dec. 31.

95 Alta....5¼
20 Alpha....11
50 Benton....3¼
300 Best & Belcher...18@18¼
260 Belcher....3.70@3.80
150 Bullion....5⅜@5.40
120 California....10⅛@10¼
10 Chollar....46¼
60 Con Virginia....8
100 Con Imperial....77c
300 Crown Point....3.65@3⅝
315 Exchequer....4¼@3.35
170 Gould & Curry....9@9⅛
40 Hale & Norcross.11½@11½
270 Justice....3.70
290 Julia....5¼@5.20
50 Kentuck....3.90
80 Mackey....1⅜
90 Mexican....31@31⅜
50 N Con Virginia....6
300 Ophir....35½@35¼
10 Overman....9⅞
40 Savage....10@10¼
110 Sierra Nevada....43@43¼
85 Silver Hill....1⅛
40 Trojan....25c
30 Union....57¼
240 Utah....11½@11
370 Ward....1.15@1¼
60 Yellow Jacket...13⅜@14

Assistant Treasurers of the United States have been instructed to make no distinction between coin and legal tenders after January 1st, 1879.

The loss in wages by the Oldham strike, now terminated, amounts to £60,000, besides the expenditure of Union funds, and a loss to capital by the stoppage, of 4,000,000 spindles.

A further enormous depreciation of Turkish paper money has occurred.

Over 10,000 bales of cotton burned at Charleston, S. C.

Mining Share Market.

There are decided symptoms of recovery in the market, especially in the Comstock shares. The Bodie stocks may remain rather low for some little time to come, particnlarly those fated ones whose mines are in that unfortunate section 16, township 4 north, range 27 east. Taking the market as a whole, it has heen prophesied that the new year's activity will far excell that of the old year; the prophet hasing his plan for the fnture, partly upon honanzas, which have hardly kept the market alive for the last month or more, partly upon the greater depth attained, and more complete developments made in old mines, and partly, which is the most sensihle of all, npon the new discoveries in Arizona and Utah. Meanwhile, instead of prophesying, let us review the solid work of the year. The gross hullion yield from our mines, west of the Missouri river, has heen (as far as Wells-Fargo's books show) $78,276,167, against $95,811,582 in 1877—a falling off of $17,535,415. Dividends paid at San Francisco during the past year have amounted to $26,649,300, of this, two-thirds was paid hy mining companies, amounting to $18,234,700. It is the mines of California, Nevada, Utah and Arizona that pay their dividends at San Francisco. These four have produced, according to the same authority, $62,455,004. Taking from this the dividends, we have $44,220,304, or ahout five-eighths of the products of the mines returned into them. This, of course, takes no cognizance of assessments nor of capital already invested.

The Betchel and Sitting Bnll have consolidated, the company taking the name of the former.

The distress among the poor in England seems to have reached its crisis.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

THE MINES.—Bodie *Chronicle*, Dec. 21: Lewis Chalmers, Manager of tha new London company—the Isabella — has arrived at Silver Moantain and is making preparations to commence work on the tunnel, the location of which is being surveyed by U. S. Depnty Surveyor L. L. Hawkins. Heavy machiuery is on the way to drive the tunnel at the rate of 200 feet per month. H. C. Ginn has contracted to build a bridge across Silver creek, near the site of the praposed tunnel. Arrangements for resuming work aa the Tarshish are progressing favorably. Coasiderable wood is being cut in the vicinity of Mouitor in anticipatiou of an early resumption of work ou the Advance and Tarshish. It is reported that three shifts will soon be put to work in the Jones drift on the Advaace. It is thought by exports who have examined the mino that the Jones drift will soon tap an immensa ore deposit.

AMADOR.

VOLCANO ITEMS.—Jackson *Ledger*, Dec. 28: Stewart's mill has got fairly started on Downs' rock again. The mill is now in fine condition for work. A crushing of quartz from Jones and Robiuson's claim, at the Stewart mill, yields an avcrage of $11 per ton. Moyle & Co's claim in Volcano basin is all ready for the commencement of operations. The lack of water is the only thing that prevents active miniug. The works have been fixed up at a vast outlay to raise the pay dirt to a hight of 60 feet, thereby ensuring a sufficieucy of fall and pumping facilities. All the workmeu have been discharged with the exception of two. The Rising Sun mine is at a standstill. The owners went to considerahlo expense in fixing up the mine and erectiag a mill, only to meet with disappointment. At the Tellurium, sinking operatious are heiug pushed ahead, through rock of the hardest character.

MOORE MINE.—Jackson *Dispatch*, Dec. 18: The ditch will he completed this week, and iron pipe is being hauled to those places where pipiag will he necessary. It will require but little time and labor now to render the ditch ready for the reception of water.

BUTTE.

A GOOD PROSPECT.—Chico *Record*, Dec. 28: A few days ago, John Allen, of the Jnnction, went np to Butte creek prospecting, and at various points on the creek, tested the richness of the ground hy panning. At one place he secured about five dollars from four pans of dirt, ane piece alone weighing almost four dollars. John has a strong idea of tarning honest miner.

GONE TO MINING.—Oroville *Mercury*, Dec. 27: A. E. Brittin, recently in the furniture husiness in Biggs, has forsaken that pursuit, and in company with Mr. H. Carrington, of the same place, embarked in mining near Powelton. Both gentlemen are experienced miners and prospectors, and will, we helieve, do well.

CONTRA COSTA.

JUDSONVILLE.—Antioch *Ledger*, Dec. 28: This town is situated about five miles south of Antioch, and about three and one-half miles from Somersville. Coal was discovered near this place as early as the year 1852, hut none of the most valuahle mines were discovered until 1868 to 1870. The Teutonia mine was located in the year 1868. This is the pioneer coal district of the Golden State. The Teutonia faces the location of the Judsonville Coal M. Co. The present owners hegan operations here ahout three years ago. The depth of the slope is now 900 feet. The company have expended a groat deal in machinery and in huilding a narrow-gauge railroad from Antioch to the mine. The quality of coal is something similar to the Somersville coal. The coal is shipped to Sacramento and Stockton, and considerahle quantity of it is consumed for domestic purposes in San Francisco. The company are shipping some 2,000 tons per month.

INYO.

A PROCESS WANTED.—*Independent*, Dec. 21: Some 35 or 40 miners and prospectors are now engaged on the small rich gold mines of Alahama district, to the northwest of Lone Pine. Two reduction works are in operation, the yield of fine gold proving the work very profitahle. At present, however, the Orion or Schnlte mine, one of the largest and first worked, is shut down, owing to the practical impossihility, so far, of separating the fine gold from the iron sulphurets, which seem to he a peculiarity of the mine. Experiments are going on to determine some method of handling them, and it is prohahle that a small roasting furnace will he put at work. Were the Beveridge and the Alabama gold fields anywhere near such a rush as Bodie, there would he thousands of men at work in them the coming summer.

ITEMS.—The Brown Monster ore hodies are developing well. The mill was not started on time on account of tho ice in the mill-race. The expenditures of the Rex Montis up to December 12th, amounted to $161,869.18, $68,-912.79 of which was paid from hullion. The assets, exclusive of the valuation of the mines, foot-up $75,571.20, giving a surplus over liahilities of $48,572.92. The long tunnel and the shaft of the Modoc, are progressing favorably. The Emigrant Campany, Lee district, ships bullion every week. The Custer, under the management of J. S. Gormau, has good prospects.

PLACER.

IOWA HILL.—Auburn *Herald*, Dec 28: The Morning Star company aro preparing for a blast of 225 kegs af powder. They are laying down railroad iron riffles in their tail sluices. Mr. W. W. Anderson, af Gold Run, has been elected superintendeut of the Orion claim, Iowa Hill. This coapany will hegin to wash about the middle of January.

CANADA HILL.—Canada Hill is 25 miles up the divide from Iowa Hill. It is on the North Fork of the Middlo Fork of the American. There are now about 20 miaers residiag at that camp. Thero are three tuunel claims, and one hydraulic claim, with a water ditch of four miles in length. One of the miners, now ou a trip helow, says that the camp is iu a prosperous condition. The same may also be said of the miniug camp at Last Chauce.

PLUMAS.

EUREKA MILL.—Quincy *National*, Dec. 21: The new quartz mill which the Plumas Eureka company have heen building, started up the other day, and runs satisfactorily. It runs by water power and adds 40 stamps to the large uumber already at work. Tho mill is probably one of the most costly in the State, having all the modern improvements, and has been fitted up regardless of expense. Our old and valued correspondeut, "Alioth," promised us a full description of tho new mill when it was completed, aud we shall look for his letter in a short time.

SANTA CRUZ.

PROSPECTS FOR COAL.—San Jose *Mercury*, Dec. 27: Ever since the survey of the South Pacific Coast railroad and the commencement of the work of piercing the mountaias with a number of tunaels, it has been helieved that valuahle discoveries would he made and mineral secrets long hidden heneath the crags of the Santa Cruz mountains would he brought to light. Espocially has it been a matter of interest as determiniag to almost a certainty whether or not there are in these hills any considerable heds of coal. Some time ago we puhlished a statcaent that the tunnel was then progressing through a species of rock greatly resembling coal, which was in an iaferior degree combustible, and which gave out gases very similar to coal gas. While these were not to he taken as evidences of the existence of coal in these hills, it did prove a condition of things at one time which rendered it very prohahle that the conditions necessary to the production of coal here had also heen perfect. This prohability has now become a certainty, as the workmen in tunuel No. 3, working at the south end, have discovered and penetrated a vein of excellent bituminous coal about eighteen inches in width, and intersecting the tunnel from east to west.

SIERRA.

MACHINERY FOR PLUM VALLEY.—Downieville *Messenger*, Dea. 28: Twenty tons of machinery for Culver & Co.'s mine at Plum valley, ahove San Juan, has heen received here, says the Nevada *Transcript*. The lot includes hoiler, engine, quartz crusher, etc. The mine is said ta have good prospects, and will he worked quite extensively as soon as the mill is completed.

TRINITY.

TAYLOR FLAT.—Weaverville *Journal*, Dec. 28: Mr. Walker, another San Francisco miniag expert who visited Taylor Flat this week, expresses himself as highly pleased with the prospects of that section. He thinks it one of the richest gravel deposits in the State.

CINNABAR DISTRICT.—Mr. J. F. Dolliffe, from the ahove district, called on us this week, and from him we learn that the Altoona company has lately struck a new vein of ore of exceeding richness; also that a new superintendent has heen placed in charge of the mine. Mr. Dolliffe further informed us that he had found some very encouraging prospects in his own mine recently.

TUOLUMNE.

CHAPMAN.—Sonora *Independent*, Dec. 28: The Chapman mine, near the Confidence mine, promises to he good property. The vciu is 33 inches wide and shows free gold and large quantities of rich sulphurets. Two or three shafts bave heen sunk along the lode, as far as water would permit, and for lack of pumping apparatus work has been suspended for a time. Here is a good chance for enterprising capitalists.

CONFIDENCE.—The miners in the Confidence are gaining on the water, and also running a drift in No. 5 level and raising good ore.

NEVADA.

Our usual summary of Washoe mines did uot oome to hand on time. The following regarding Nevada mines is taken from letters:

SAVAGE.—Letter of 31st says: There is nothing new in the mine to report. Working along as usual in crosscnt and drift. Everything working well.

SILVER HILL.—Letter of the 28th says: We have run the St. Louis drift 34 feet siuce last report, and the 1100 level crosscut 10 feet. Our new pump is running first-rate, also our new boh.

CHOLLAR.—Letter of the 28th says: At the Chollar-Norcross-Savage shaft during the past week we have been working on pumps which are nearly finished. We have eased and repaired 45 feet of the shaft.

GRAND PRIZE.—Letter af the 30th says: Ledge in crosscat on 500 level looks very well. The ore is rich; will mill over $200 per ton. Water coatinues very strong in face of crosscut aud progress will be slow for a few days until the ledge drains out.

MANHATTAN.—Letter of the 27th says: During the past week the mill redneed 144 tons and 290 pounds of ore of the value of $28,944.-54. Of this amount, $9,301.03 was from custom ores; $5,916.63 from tnihute mines; and $13,726.83 from the Frost and Curtis shafts.

HALE & NORCROSS.—Letter of the 30th says: Our east drift on tho 2000 level has been advanced 81 feet siace last report aad is uow 811 feet. No material chauge in the character of the ground, 16 sets of timbers have been set up. The water stands to-day 54 feet below tho 2000 level.

ARGENTA.—Letter of tho 27th says: East winze No. 1, 200 level, is down 28 feet. Sample of ore from bottom to-day assayed $1,700 per ton. The face of east drift, 200 level, looks as well as usual. East drift, 200 level, is lookiug better thau at last roport. Stopes are all looking well.

RAYMOND & ELY.—Letter af the 23d says: During the week nothiag new has transpired. Crosscut on 1400 level measured 66 feet yesterday. The last 10 feet in quartz heavily charged with pyrites and quite hard. Have started drifts east and west ia hangiag wall and will soon make two other crosscuts. Tenth level about the same as last report; looking a little better in the east end aad not quite as well in the west, where the formation seems more broken than heretofore. Old levels are turning out a little good ore all the time. The mill has commeuced workiag low-grade are and tailiags.

UTAH.—Letter of the 28th says: Our main incline bas been sunk and timbered 16 feet the past week and is now 180 feet below the 1350 level. The bottom is in good working rock; the flow af water continues ahout the same. We are making some repairs in the incline. Our improvements on the surface are progressiag rapidly.

HAMBURG.—Letter of the 29th says: There is no special change to note in appearance of ore in north drift 40 feet below 250 level. South drift, same level, shows a material improvement, the vein of oro having widened and coutinues to be of extra good quality. North drift 80 feet below 250 level was continued 22 feet, making a total from winze of 84 feet; near the end of this drift we have started an npraise on the vein to connect with the ore in bottom of north drift 40 feet ahove. West crosscut from end of south drift, 600 level was advanced 20 feet, face still in favorahle vein matter. We have shipped to the furnace during the week 75 tons of first-class ore.

ARIZONA.

We condense the following from the Prescott *Miner*, of Dec. 13:

OCCIDENTAL.—Marshal Duke, interested in this gold mine on Lynx creek, thinks favorably af the prospect. The mill, now in order, will soon start up on first-class ore. Development is carried on hy ten men.

MCCRACKIN.—In the Bateman tunnel, 900 feet below the surface, a very rich strike has been made. Twenty men are developing the mine.

A NEW FIND IN THE JUNIPER RANGE.—Messrs. Cooney, Burns and Waters, have located some very rich silver ledges near the headwaters of Sycamore creek, a trihutary of the Santa Maria. The discoveries are in a helt of slatc. Assays go up into the thousands.

COLORADO.

GENERAL MINING NEWS.—Boulder *News and Courier*, Dec 20: The Terrihle mine at Georgetown is heing again profitahly worked. It is estimated that 100 feet square of the Little Pittshurg deposit is worth, in round numhers, $1,000,000. The Long and Derry mine at Leadville has heen honded for 60 days hy Mr. Teats of Gilpin county, in hehalf of Senator Teller, for $260,000. Some ore from a new discovery near Twin lake, in Lake county, assays 22,000 ounces to the ton, of horn silver. The ore resembles hlack lava, and appears in large quantities. Ten-mile district, near Leadville, will be a famous locality hefore another winter rolls around. Recent assays have returned 1,800 ounces of silver per ton from heavy deposits of mineral. In Summit district, a rich strike has heen made in the Little Annie mine, showing much free gold. This class of ore is sacked and sent to New York. It fairly bristles with gold. The mine has kept its 10-stamp mill husy the entire season. We learn from the *Chieftain* that a new excitement has arisen in Puehlo over the discovery of a rich silver mine in Dry creek, ahout three miles north of town. Specimens of the mineral were assayed at the lixiviation works, and gave large returns. The Little Chief mining property, at Leadville, was sold Tuesday to Chicago parties for $360,000. A good strike has lately heeu made in the Dunkirk lode, helonging to the Herman mining company, of New York.

IDAHO.

SNAKE RIVER.—Boise *Statesman*, Dec. 21: Mr. Miles Burston who resides on tho Snake river hottom a few miles helow Salmon falls, was in town yesterday, and from him we learn that there are several companies uow organized and at work on the bars of that section of the river. Tho numerons large springs which gush out from the banks of the river for several miles on the north side afford an ahundant supply of water, which will now be utilized in working the hars, where prospects as good as those af the great Bonanza har have heen fouud. Mr. Burston says that parties have been prospecting the river as far dawn as the mouth of the Bruneau, aad have found gold in quantities that will pay well hy the new process, which they are alsa preparing to introduce.

RUTH DISTRICT.—Boise *Statesman*, Dec. 24: Mr. John Atwell came iu on Saturday from Ruth district, Weiser miaes. He has been engaged in quartz mining in this district for four years past. Work has gone on very slow and only a few meu have been eagaged in the mines—only five men on them now. Mr. James Ruth will have his quartz mill in operation early in the spring. The battery is put up in its place, and the rest of the inside work will be put in this wiuter. The Indian troubles put them back a good deal last summer and summer before, but a few meu have beeu there all the time, and they have several well-defined leads opened, and they are very sanguine that another year will put some of these mines into a prosper aus and paying coudition.

MONTANA.

RICH STRIKE IN THE LEXINGTON.—Helena *Independent*, Dec. 19: New and very rich bodies of ore have recently heen developed in the Lexington miae ou Teu Mile. At the present time the shaft is 160 feet deep and the lode is four feet iu width. There are streaks of ore ruaniug through the lode that assay $5,000 to $20,000 per ton. The mino has always paid expenses, but nover before had such a bonaaza.

ITEMS.—The Bluehird hoisting works have heen destroyed hy fire. Christ, King, Fred Muller & Co., have good pay in Central district. The Benson honanza, New York gulch, will no doubt pay well when experienced meu take hold of it. The suit, at Helena, of King vs. the Natioaal Miniug Co. for $500,000 damages by trespass, has heen decided for the defendaut. Eleven tons of Bercaw ore yielded hy arastra $226. It is reported that there is euough ore in sight at the Penohscot to keep 100 stamps running for a year. The Hope mining company at Philipshurg, are still taking out ore. The Northwestern company have laid in immense supplies of wood and salt. From three to four feet of the lode tapped hy Murray & Durfee iu the Sharktown tunnel samples 130 to 200 ounces per ton. The whole lode, over nine feet wide, carries paying quantities of silver.

NEW MEXICO.

GEORGETOWN AND SILVER CITY.—Quartz writes to the Salt River *Herald* from Georgetown, under date of Dec. 11th: Most of the miners are doing well. Kennedy & Harper are constantly taking out ore. Deller & Webster have taken out some 25 or 30 tons of $200 ore duriag the last two or three months. John McGregor has a lease on a large streak of rich ore. Lemon & Kitt, lessees of the McNulty, have struck a rich streak. The Naiad Queen, Meredith & Ailment, keep six hammers husy on are which yields from 100 to 2,000 ounces per ton. The Commercial and Satisfaction are turning out a great deal of ore. The mines ahout Silver City show equally hopeful signs. In the Legal Tender and the New Issue it is estimated that there are at least 2,000 tons of ore in sight, which may pay from 20 to 500 ounces per ton. Their ores principally cousist of gray carhonates, sulphurets and chlorides and some heautiful specimens of horn silver may ho seen at all depths, as far as they have been worked. In fact oue can scarcely hreak open a piece of quartz that does not show more or less horn silver.

OREGON.

MINING ITEMS.—Jacksonville *Sentinel*, Dec. 25: T. L. Beck, of Willow Springs, last week picked up a gold nugget weighing $18.75 while cleaning up the hedrock on his claim. McKnight & Goldworthy of Foot's creek are now ready to hegin hydraulicking. Byhee, Hawkette & Co., near mouth of Slate creek, have suspended on account of the freezeup. All the hydraulic miners in this county are ready to commence work as soon as they have water. It is now feared that the season will be a dry one, as the winter rains during a wet season generally hegin ahout the middle of Decemher. Last winter, however, very little rain fell before the middle of January, aud still the miners had a long and prosperous run. It is hoped that it will he the same this year.

UTAH.

PARK CITY.—Salt Lake *Tribune*, Dec. 24: McCormick & Co. yesterday received 22 hars of hullion from the Marsac mill in Park City. It is hase, hut runs high in silver, heing ahout 260 fine. This makes the second shipment, the first having heen received on the 17th inst. in 12 hars. That, however, went low in silver. Mr. Ferry, who has the running of the mill, is adopting means to increase the grade of hullion, and save all there is in the tailings at the old Marsac, from which these hars are heing made. Weekly shipments may he expected now while the tailings last.

ORE FROM NEVADA.—Ores from Nevada still come to the Salt Lake market to he disposed of. The last lot came from the Jersey and other mines at Battle Mountain, and was consigned to McCormick & Co., by J. A. Blossom. This ore consisted of three carloads in seven lots of various grades, ranging from 50% to 60% in lead, and from 50 to 150 ounces in silver. Lead ore is just what our smelters need at the present time, and they must have it in order to run.

Mines and Works of Almaden.—No. 16.

Translated for the PRESS from "ANNALES DES MINES."]

Is the condsnsation effected in a snfficient mannsr either in the aludels or in the condensers? If it is hadly accomplished, we should assnredly find mercurial vapors in the gas which escapes hy the extreme chimneys.

M. Lncas de Aldana, to-day Inspector-General of Mines, made, in 1851, a series of experiments upon this snhject; he looked for the mercurial vapors hy placing a leaf of gold (*une feuille d'or*) at ths upper part of ths chimneys. Let us see the acconnt rendered of his experiments (*Revisito minera* t. II., p. 378).

The leaf of gold placed during 12 hours, at the end of the second day of work, npon the extreme chimney of a Bnstamente furnace, had not presented after thess 12 hours anything but a deposit of small drops of water condensed.

After 32 hours of the period of roasting, and 24 of cooling, the gold plate presented a white spot in the center.

After 16 hours of the period of cooling, nothing.

After 24 hours of the period of roasting over the worst of ths furnaces, the spots were a little increased.

After 25 hours, another time, very slight traces.

After 94 hours, they were sensihly amalgamated.

What do these results prove? That there is an amalgamation of the sheet of gold, hy consequence of a loss of mercury, it is true. But not that this loss is elevated. If the loss was 30% there wonld escape hy the two chimneys ahout 350 kilograms of mercury; let us even reduce this figure hy half, admitting that one-half escapes by the cracks, there would still he 87.5 kilograms which would escape hy each of the chimneys during the two periods of firing and of roasting; the amount of amalgamation ssems very small for a plate of gold one decimeter square, over which had passed 87.5 kilograms of mercurial vapor.

These experiments have also proved that the amalgamation seems more difficult in the presence of the vapor of water.

All these contrary considerations would leave us in complets indecision, without the exact experiments to which we have already alluded. We think advisahle, in order to show under what exact conditions these experiments have heen made, to recount hriefly their history. A French engineer, M. Emile Pellet, had presented to the Conncil of Mines (*Junta de minas*), in 1867, the plan of a new furnace for the distillation of the ores of msrcury. The council gave, April 10th, 1867, a report favoring a trial of Pellet's system; the royal order was given June 5th of the same year. The Pellet furnace was hnilt in 1868 and the experiments were hegun in 1869

Let us see the principles of the new method: 1st. Calcination is still adopted; the fuel is coke mixed in thin alternating layers with the ore. 2d. The condensation is accomplished in five chambers of which the last four are divided into two compartments hy a median wall pierced with holes. In these chamhers falls a continuous rain of fresh water. The hottom is covered by a hed of water which ordinarily isolates each chamber from the preceding; the vapors can not pass from the one to the other, except when the bed of water is agitated in such a manner as to disclose the opening. This agitation is produced by the action of a ventilator, which draws the gas and the vapors.

The consumption of water, considerable for an establishment which has at its disposition only that which is extracted from the mines, the necessity of men constantly occupied with the charging and discharging, the necessity of a motor for the ventilator, the need of watching the level of water in the chambers, the impossihility of remedying serious accidents without first cooling off the fire, and, finally, the difficulty of treating the fine ore, were certainly grave inconveniences of the new system; they might assuredly he neglected without hesitation, if the furnace had heen ahle to realize the hopes of its inventor, viz., ahsolute, or at least nearly ahsolute, snppression of the losses of mercury, economy in the costs of treatment, suppression of the mercurial vapors, so injurious to the health of the workmen.

In case of success, M. Pellet required that they should give him, as a reward, the henefits resulting from the application of his system dnring one year. These henefits were estimated to he 3,730,000 francs. The assays were hegun April 4th, 1869, under the direction of M. Monasterio, Inspector-General of Mines, and Director of the School of Mines at Madrid.

M. Pellet first made a preliminary assay of 55 tons of ore; 54,952 kilograms of ore, containing 4,501.523 kilograms of mercury, gave:

	Kilograms.
By direct distillation	2,399.10
Batido de cabezas	508.20
90% of mercury of the residues	348.54
Total	3,255.84

Loss, 1,245.677 kilograms, which is 2,266% of ore treated, or 27.672% of mercury contained. They proceeded theu to a comparative test hetween the Pellet furnace and the Idria furnace. The results of this trial are of great interest, not so much for the Pellet furnace, as that is no longer a question to-day, as for the Idria furnace, which is still in use. In order to give to M. Pellet all the guaranties of equity and impartiality that he could desire, the following arrangements were exactly observed:

The ores divided into 10 classes remained exposed to the air at the disposition of M. Pellet for all ths observations which he wished to make during the month of April. M. Pellet dcclared himself entirely satisfied with the classification.

The two furnaces to he compared were each separated by a wall in such a manner as to permit an exact control of the materials. Three watchmen were detailed hy day and three hy night. The charges were weighed exactly, and they wers made identical for each furnace, hoth as to weight and as to contents. Assays were carefully taken from each weighing, and were made hoth hy the engineers aud hy M. Pellet. All the products were accurately weighed. All other work in the neighhorhood of the two furnaces was prohihited.

M. Pellet himself recognized the high sentiments of justice which inspired M. Monasterio, the character of which was a guaranty of the most perfect impartiality of the experiments.

[To be Continued.]

A NEW INDICATOR.—The Gold Hill *News* thus describes a valuahle invention of Hans Behr, a machinist at the Foulton foundry, Gold Hill: "It is an indicator by which the engineer is to determine the exact location of the cage when moviug up and down the shaft, and thus enable the prevention of many of the accidents that still occur from time to time, with the best patented indicators now in use. Behr's indicator consists of a simple, upright spiral screw, haviug a direct positive connection and action with the hoisting engine. To this screw is attached a hand or indicator which moves up or down as the cage is hoisted or lowered in the shaft, marking with the utmost precision and unerring certainty on a dial plate representing the shaft aud its stations, no matter how many in number, the exact position of the cage. The attachment is so direct, simple and positive, that if the engineer pays attention to the indicator it seems impossible for an accident to occur. This indicator has heen chosen for the works of the North Con. Virginia shaft, an argument much in favor of the invention."

IT is calculated that £2,000,000 a year of property is destroyed by the London smoke.

Harlan's Buzzard.

Our engraving shows Harlan's huzzard which was added to the fauna of ths United States hy Mr. Audubon about the year 1830, and by him called after Dr. Richard Harlan, of Philadelphia. He speaks of two specimens only, which were captured in Louisiana. They had hred in the neighhorhood of the plaes where fonnd for two seasons, but their nests were not seen. Their young are said to appsar of a leaden-gray color at a distance, but to hecome as dark as the adult birds at the approach of winter. These hirds were successively seen perched on the top of a high tree, standing in an erect attitude, and appeared so like the hlack hawk (*Falco niger*) of Wilson, as to be at first taken for it. They were hard to approach, and when severely wounded and captured they proved fierce, courageous and intractahle, and died refusing food. They were considerahly smaller than the red-tailed hawk, to which they are allied, but superior in daring; their flight is rapid, protracted, and so powerful as to enable them to seize their prey with apparent ease, or to effect their escape from the red-tailed hawk, which pursues them on all occasions. They have not heen observed to fall on hares or squirrels, hut at all times evince great fondness for common poultry, partridges, and the smaller species of wild ducks.

HARLAN'S BUZZARD.

COAGULATED PETROLEUM.—If powdered soapwort (root of *Saponaria officinalis*, L.), previously wetted with water, he added to petroleum, no matter how light its density, the two snhstances form a thick mucilage; so that the vessel contaiuing the mixturo may he inverted without any of it flowing out. On adding a few drops of carholic acid and stirring, the mncilage hecomes clear in a few minutes.

MR. GEORGE WYLD, M. D., says: "Although I have always held that electricity, sooner or later was destined to become the light of the future, still my faith in gas is so strong, that I have doubled my stake in gas shares since the scare hegan. Coal gas is destined to hecomo the cooking and heating power of the future."

LINEN and woolen fahrics aro entirely incombustihle if impregnated with a solution containing five per cent. of alum and five per cent. of phosphate of ammonia. They lose this quality hy washing.

THE ENGINEER.

The Effect of Brakes On Railway Trains.

At a recent meeting of the Institution of Mechanical Engineers, at Manchester, England, "The Effect of Brakes on Railway Trains" was the subject of a paper hy Capt. Douglas Galton, C. B., in continnation of a paper read hy him at the Paris meeting of ths institution. He described minutely the results ohtained hy experiments on the London, Brighton and South Coast and Northeastern railways. Recapitnlatiug what appeared from these experiments to be the essential conditions of a good brake, he said the pressure with which the hrake-hlocks were applied to the wheels should he as high as possihle, short of the point which would cause the wheels to he skidded and slide on the rails. In practice, and as a question of safety, it was of the greatest importance that, in the case of a train traveling at a high rate of speed, that speed should he reduced as rapidly as possihle on the first application ot the hrakes. For instance, a hrake which reduced the speed from 60 miles an hour to 20 miles an hour, in say six seconds, had a great advantage as regarded safety over a hrake which would only reduce the speed from 60 to 40 miles an hour in the same time. The maximum pressure should he applied to the wheels as rapidly as possible, and uniformly in all parts of the train. The skidding of the wheel, so that it slid on the rail, was altogether a mistake, so far as rapid stopping was concerned; in addition to this it must clearly cause a deteriorating effect in tending to force forward the rails and sleepers; whereas, so long as the wheels continue to rotate, no such effect would be produced. Railway companies, in considering what form of hrake was hest suited for traffic, must, whilst they gave full weight to the mechanical conditious discussed in this paper, also ascertain the durahility and facilities for maintenance and repair presented hy the varions systems. It was further clear, from the prseut series of extents, that the universal application of continuous hrakes would raise many questions as to the strength of the rolling stock now in use, much of which was constructed originally to meet other conditions of traffic.

Improvements on the Kanawha.

The Government improvements of the navigatiou on the Kanawha river, hy dams and locks, now under way, will tend to develop the resources of this most wonderful region. The *American Manufacturer* says: Ten locks and dams will furnish slack-water navigation from tho Ohio river to Cannelton, a distance of 85 miles, the cost of which will he ahout $250,000 for each dam with lock. Of these ten, there will he three ahove and seven hclow Charleston. These locks and dams are heing constructed of hewn stone, and in the most workmanlike manner. In niue of the dams, however, there is to he an "open pass," 250 feet in length. In this "opeu pass" thers is to he a wooden and iron structure, so arranged that it can he elevated in low water, and therehy furnish seveu feet of water iu the shallowest places in the river, and can be lowered during high water, and therehy furuish free and unobstructed navigation during the rises in the river. Hence these dams are called "uiovahle dams." The first nine dams from the Ohio river are to he movahle dams, which will furnish seven feet of water from Paint creek to the Ohio river during low water, and an open river during high water. The locations aud lifts of the dams will he as follows: At or near the mouth of the Kanawha, eight feet lift; at or near Dehby's Ripple, seven feet lift; at or near Gillespie's Ripple, six feet lift; at or near Red House Shoals, six and one half feet lift; at or near Johnson's Shoals, seveu feet lift; at or near Newcomer's Shoals, six and one half feet lift; at or near Island Shoals, seven feet lift; at Brownstown, seveu feet lift; at Cabin creek, seven feet lift; at or near Paint creek, fifteen feet lift; total "lifts," 77 feet, in a distanco of 85 miles.

Improvement in Our Ship-Building Industry.

So much is said about the impossihility of a revival of the ship-huilding industry in this country under the present tariff, that we are glad to pick up every item hearing on the subject. The following statistics will he interesting in this connection:

During the fiscal year ending June 30th, 1878, 32 irou vessels were huilt, with a tonnage of 25,960.29 tons. This record is second to the hest record the country has yet made, which was in 1874, when the tonnage aggregated 33,097 tons. The next hest record in tonnage was in 1873, when it amounted to 26,548 tons. The numher of iron vessels huilt during the past year was greater than in any other year, the ycar which most favorahly compares with it heing 1873, when 26 were huilt. Of the vessels huilt during the past year, 9 were ocean propellers, varying in tonnage from 1,156 tons to 3,548 tons; 1 was a lake propeller of 306 tons; 1 was a stern-wheel river steamer of 1,028 tons; 7 were side-wheel river steamers, ranging from 128 to 1,285 tons; 13 were steam tugs, the largest of which measured 180 tons; and the remaining vessel was a yacht.

The numher of vessels and the tonnage will, this year, probahly exceed that of any previous

year in the history nf the cnuntry. One nf ths latest launches was the fine steamer *St. Johns*, for ocean and river travel, from ths yard nf the Harlan & Hollingsworth Company, at Wilmington, Del. The *St. Johns* is for tbe Charleston, Savannah & Florida Line, and her measurement is as follows: Length, 260; beam, 38 feet; beam over all, 64 feet. Her cylinder is 66 incbes in diameter, witb 12 feet length of stroke.

At the yard of John Roach, Chester Pa., the double tnrrcted monitor *Miantonmah*, Government vessel, is in hand, receiving her machinery and finishing touches. Two other vessels are on the stocks, nnd a large number of men havs recently been added to the working forcs in the yard, giving it a more lively aspect than it has worn for some time.

Bridging the Bosphorus.—Capt. James B. Eads, the well-known engineer of tho iron bridgs at St. Lonis, who has long been connected with the jetties at the delta of the Mississippi river, bas recently prepared plans for bridging ths Bospborus, thns conncctiug Pera with the Asiatic shore. Capt. Eads was assisted in his calculations and surveys by A. O. Lambert, a civil engineer. The bridge will be 6,000 feet long and 600 feet wide. It will have fifteen spans, and will bs almost entirely built of iron. Ths higbt of the roadway above the surfaco of ths water will be 120 fset, 60 fest less than the elevation of the Brooklyn bridge. Tbe centor arch will be a apan of 750 feet, one of tbe longest spans ever contemplatod. The central piers or main portion of the strnctnre will he 50 feet thick, built of solid granite blocka fastened together with iron braces. The main tiers are 270 feet high from foundation to anmmit. The cost of the entire atructure is estimated at between $18,000,000 and $25,000,000, and six years nre given as the time to complete it. Excellent granite is near at hand, and as the iron work will probahly be done in France and Belginm, there will be no delay. It is also thought that cheap labor can be employed. The increase in the value of property that will necessarily follow the completiou of the work, it is believed, will amply repay the coat of the project. The construction of the hridgo will doubtless do much towards the completion of the Euphrates Valley railroad, making it the preferred route to India.

The Gibraltar Tunnel.—The proposed tunnel between Spain and Africa ia still hcfore the public. This tunnel, according to the plan at present contemplated, is to extend from withiu a short distance of Algeciras, on the Spanish side, to between Tangier and Ceuta on the African side. The length of the submarine tunnel will be nine miles, with an inclination of nne foot per hundred, and the approaches will have an extent of six or seven miles. The greatest depth of the sea is 3,000 feet; and, as it is intended to have a thickness of some 300 feet of rock left hetween the roof of the tunnel and the sea bottom, the greatest depth of the tunnel will thus he 3,300 feet below the level of the sea.—*Am. Architect.*

The St. Gothard Tunnel.—The popular vote on the Gothard juestion, which will probably decide the fate of the enterprise, is fixed for the second week in January. Meanwhile the Federal Council has passed the engineers' estimates for the seventh year of construction. Twelve million three hundred thousand francs have to be spent on the works during the period in question, and it is calculated that by next October the tumel will have been bored to a length of 11,000 yards.

Engineering.—We notice that Col. J. D. Schuyler has been called from his chair as local editor of the Stockton *Independent*, to take a position on the staff of State Engineer Hall. Col. Schuyler is well fitted for this branch of the State's work, both hy talent and education, and we have high trust in his record in his new field. He has an earnest zeal for developing the resources of theState, and we doubt not this will he the moving impulse in the important task which he assumes.

Cost of Artesian Wells.

The *Bulletin* extracts the following from the "Prospectus of the Kern Valley Colony:"

Of iron pipe, double, 7 inches diameter, various depths:

First 50 feet boring, at 50 cents per foot	$25.00
50 feet pipe, at $1.00 per foot	50.00
A 50-feet wel costs	$75.00
Second 50 feet boring, at 50 cents per foot	25.00
50 feet pipe, at $1.00	50.00
A 100-feet well costs	$150.00
Third 50 feet boring, at $1.00 per foot	50.00
50 feet pipe at $1.00	50.00
A 150-feet well costs	$250.00
Fourth 50 feet boring, at $1.50	75.00
50 feet pipe, at $1.00	50.00
A 200-feet well costs	$375.00

The flow varies in different wells, bnt tbere are very few that will not irrigate 40 to 80 acres. The capacity may be atated at 40 to 200 acres. A flow of one and a half inch over the pipe is estimated to give 6,000 gallons per hour, or supply a town of 5,000 inhabitants, using 30 gallons each per day. The flow may he checked or controlled, to moisten or inundate.

Useful Information.

How to Do Up Shirt Bosoms.—Take two tablespoons best starch, add a very little water to it, rub and stir with a spoon into a thick paste, carefully breaking all the lumps and particles. Add a pint of boiling water, stirring at the sams time; boil half an hour, stirring occasionally to keep it from burning. Add a piece of "enamel" the size of n pea; if this is not at hand use a tablespoonful gum arabic solution, (made by pouring boiling water upon gum arabic and standing until clear and transparent), or a piece of clean mutton tallow half the size of a nutmeg, and a teaspoon of salt will do, but it is not as good. Strain tbe starch through a strainer or a piece of thin muslin. Have the shirt turned wrong sids out; dip the bosoms carefully in the starch and squeeze ont, repeating the operations until tho bosoms are thoroughly and evenly saturated with the starch; proceed to dry. Three hours before ironing dip ths bosoms in clean water; wring out and roll up tightly. First iron ths back by folding it lengthwise through ths center; next, iron the wristbands and both sides of the sleeves; then ths collar-band; now place the bosomboard under the bosom, and with a dampened napkin rub ths bosom from the top towards the bottom, smoothing and arranging each plait neatly. With a smooth, moderately hot iron, begin at top and iron downward, and continue the operation until the bosom is perfectly dry and shining. Remove the bosomboard and iron the frout of the shirts. The hosoms and cuffs of shirts, indeed of all nice, fine work, will look clearer and better if tbey are first ironed under a piece of thin old muslin. It takes off the first heat of the iron and removes any lumps of starch.

Danger from Lubricating Oils.—From a paper read by Prof. John T. Ordway, at a recent meeting of the New England Cotton Manufacturers Association, it appears that many of the oils used for lubricating machinery may be classed as dangerous, because when heated to a sufficient degree they throw off an inflammable vapor. In this respect it is claimed that some of the animal and vegetable oils are even more hazardous than those which are partially mixed with earth oils, and that the higher price of an oil is hy no means a guarantee of safety. An account was given of a fire last summer in the Bates Mills, Lewistown, Me., at which the flames, on reaching the weaving room, shot across it in all directions on a level of about five feet from the floor, and with sufficient heat to melt the lead counections to a gas meter located on the same plane of hight—from which the gas had been fortunately shut off—while a towel hanging two feet below this level was not scorched. This would seem to show that there was a body of inflammnhle vapor hangiug in the air, cast off by the oil used on the machinery.—*Scientific American.*

How to Smoke a Pipe.—A correspondent of the New York *Sun* gives the subjoined information: To those who are attached to the pipe, it may be a matter of interest to know how their last puff or draft of smoke may he as fresh as the first. It is well known that smoking in the usual manner the last portion of the tobacco becomes damp by presence of oil or nicotine drawn from the heated tobacco above, which causes a sickening and nauseating effect, hitter to the taste, unpleasant and unhealthy, as compared to the first half of a well-filled pipe. The following I have found to be effectual in giving me a good, fresh smoke from first to last: Place a small quantity of tobacco in the bottom of the bowl, light it, and when well afire, fill the pipe and before each draft give a light puff outward through the atem, which causes the tobacco to burn upward, all below being consumed. This is a sensible way of smoking the time-houored pipe.

A Warning to Amateur Chemists.—A recent fatal explosion of an oxygen retort in London, calls out the fact that two other accidents of the same nature have occurred within a few years. In both these casea binoxide of manganese was used as the source of the gas, and it was afterwards discovered that the oxide was adulterated, in one instance with soot, in the other with antimony sulphide, making mixtnres as dangerous as guupowder under the conditions required in the manufacture of oxygen. As this compound of manganese is very frequently used in the production of oxygen for experimental purposes, in the class room and elsewhere, it should always be tested beforehand for such adulterations.

Making Pencil-Marks Indelible.—Paper marks arc made indclible, says the *Papier Zeitung*, on paper prepared as follows: Any ordinary drawing-paper is slightly warmed and then rapidly and carefully laid on the surface of a bath, consisting of a warmed solution of bleached colophonium in alcohol until the entire surface is moistened. It is then dried in a current of hot air. The surface of the paper becomes smooth, hut readily takes the impression of a lead-pencil. In order to make the lead-pencil marks indelible, the paper is warmed for a short time on a stove. This method may prove valuable for the preservation of working drawings when a lack of time will not permit the draftsman to finish them in ink.

Coating Boilers.—Mr. Franz Beuttgenback gives the following recipe for the preparation of a coating for the inside surface of boilers to prevent the formation of scale: Gradually dissolve five pounds of a mixture of 25 parts nf colophonium, twn and one-half parts of graphite, and two and one-half parts of lamp black in 40 pounds of boiling gas tar, adding about one pound of tallow. The solution is diluted with about 50% nf the petroleum and applied in a warm stats. It has a pungent smell and should be put on rapidly, ths precaution of using closed lanterns being necessary. Its effect is to causo tho scalo to come off in large flakes when picked.

To Remove Ink from Carpets.—When freshly-spilled, ink can be removed from carpets by wetting in milk. Take cotton hatting and soak np all the ink that it will receive, being careful not to let it spread. Then take fresh cottou wet in milk, nnd sop it up carefully. Repeat this oporation, changing cotton and milk each time. After most of the ink has been taken up in this way, with fresh cotton and clean, rub the spot. Continuo until all disappears; then wash the spot in clean, warm water and a little soap, rinss in clear watsr, and rub until nearly dry. For ink spots on marble, wood or paper, apply nmmonia clear; just wetting the spot repeatedly till the ink disappears.

Straightening a Wooden Shaft.—Mr. D. A. Ammen, of Snowville, Va., senda the following: A wooden shaft can be straightened by taking hard acasoned wood and haking it in a stove or oven to get it to the smallest possible size. Dovetail it into the awagging side of the shaft, at the crookedest part. I straightened, perfectly, my bolt shaft, 22 feet long, in this manner, and have used it three years.

Rusted Steel Grates.—First the rusted steel should be washed with a solution of half an ounce of cyanide of potassium in two ounces of water. Then it should be cleaned by brushing with a paste made of hnlf an nunce of cyanide of potassium, half an ounce of castile soap, oue ounce whiting, and water aufficient to form a paste of the whole.

The Chinese make cracked porcelain by combining steatite with enamel. When put in the oven the mixture divides ao as to show a network, as it were, of cracks.

Good Health.

Contagion in Carpets.

Sewerage in these daya is receiving a fair share of puhlic and private attention, and the walls of houses, where contagious diseases have been, are very generally cleaned, whitewashed, or newly papered; but carpets are too often overlooked aa the carriers of disease. The truth ia that they, more than any article of furniture, more even than the walls of the room, gather and retain dust; and this dust, though chiefly inorganic and comparatively harmless, contains organic germs, which only need to be raised into the air and taken into the human economy to develop into active disease, creating, under favorahle circumstances, an epidemic. Dust usually considered as comparatively harmless, is a most fruitful source of catarrh and consumption. The irritation of the mucous membrane of the nose, throat and lungs, becoming chronic, leada to serious disease, that undermines health and destroys life.

Many women say: "If it were not for the sweeping of my carpets I could get along with housekeeping very well." Many women know from experience that aweeping is one of the great trials of the housekeeper's life, and that it causes much of "the weakness" among women. "Fore-warned is to be fore-armed." When we see the need of change, we are ready to accept the better methods. What shall these hetter methods be in relation to carpets and disease?

How easy carpets may convey contagion was proved by a case quoted by Prof. Tyndall, when he showed that a case of scarlatina, which was supposed by the physicians to be sporadic, was not so, but obtained by contagion. He said: "The question arose, how did the young lady catch scarlatina? She had come on a visit two months previously, and it was only after she had been a month in the house that she was taken ill. The housekeeper at once cleared up the mystery. The young lady, on her arrival, had expressed a wish to occupy a nice isolated room. In this room six months previously a visitor had been confined with an attack of scarlatina. The room had been swept and whitewashed, but the carpets had been permitted to remain."

The Value of Different Parts of Meat. Why is there so much difference in the nutritive value of the flesh of animals in different parts of the body? Answer—Flesh is composed of numorous huudles of minute tubes adhering together in a mass. These tubes are filled with the juices of the flesh. Now the quality of the flesh depends much on the juices, while the tenderness or toughness depends largely on these tubes, and these vary with the age and condition of the animal. In old or ill-fed animals the tubes are more than the juices, and the meat is tough. In youug animals it is the reverse. There is more nutriment in the flesh of animals not too young or too old, and neither too fat nor too lean.—*Dr. Holbrook.*

How to Make and Use Beef Tea.

An ordinary glass jar, such as is used in canning fruit, with the glass cover laid over the top, is very convenient, but like all other receptacles, must be thoroughly cleansed and aired after using before using again. Scrupnlous clennliness is very essential. If in great haste, the juiciest portion of the beef held over n brisk fire until heated, but not cooked, and then squeezed hard through a perfectly cleansed lemon-squeezer, is an excellent way, and makes a palatable article with the addition of a little salt. Salt is ths only seasoning usually allowed, but tbe patient's taste should be consulted, when not injurious. When ths patient tires of these modes, scraps with a sharp knife enough lean, juicy beef to fill a pint bowl, add a little water, cover close and set in the oven and let it bake slowly. When about half done remove the cover and let it brown a little, then cover again nnd let it cook a while longer. Beef tea made after this last mode has been accepted in cases where all other ways have failed.

Never approach a patient with a spoon in the hand when about to give nourishment. Put just what yon wish taken, and no more, in the daintiest and prettiest teacup in the house. Have tbe tea of just the right temperature, and let the patient drink it from the cup, but remove the cup from the room as soon as used; and, we would add, wash, scald and put it in its proper place. When more tea is needed, take another and entirely different cup. This seem a little thing, but the comfort of the sick must depend largely on little things, and who shall blame them if sometimes fanciful or unreasonable?

Useful, if not New.

Tho following simple rules for preserving health and for promoting personal comfort, if not new, are none the less important to every one:

The object of brushing the teeth is to remove the destructive particles of food which, by their decomposition, generate decay. To neutralize the acid, resulting from the chemical change which such particles as are not removed undergo, is the object of dentifrices. A moderately stiff brush should be used after every meal, and a thread of silk floss or India rubber passed through between the teeth to remove particles of food. Rinsing the mouth in lime water neutralizes the acid.

Living and sleeping in a room in which the sun never enters is a slow form of suicide. A sun bath is the most refreshing and life-giving bath that can possibly be taken.

Always keep the feet warm, and thus avoid cold. To this end, never sit in damp shoes or wear foot coverings fitting and pressing closely.

The best time to eat fruit is half an hour before breakfast.

A full bath should not be taken less than three honrs after a meal. Never drink cold water before bathing. Do not take n cold bath when tired.

Keep a box of powdered starch on the washstand; and after washing, rub a pinch over the hands. It will prevent chapping.

If feeling cold before going to hed, exercise; do not roast over a fire.

Starvation in the Nursery.—In an article headed "Starvation in the Nursery," the London *Lancet* calls attention to what it says is a fact established by daily experience—that large numbers of persons occupying decent positions in society systematically starve their children, in respect of that article of food which is the most essential to their nutrition. Even to very young and fast-growing children they give cocoa with water, and not always a suspicion of milk; corn-flour with water just clouded with milk; tea, oatmeal, baked flour, all sorts of materials, indeed, as vehicles of milk, hut so very lightly laden with it that the term is a sham. The consequence of this misplaced economy is, that there are thousands of households in which the children are pale, slight, unwholesome-looking, and, as their parents say in something like a tone of remonstrance, "always delicate." Ignorance, no doubt, is often the cause. The parents do not know that, supposing there were no other reason, their wisest economy is to let their growing young ones have their unstinted fill of milk, even though the dairyman's bill should come to nearly as much as the wine merchant's in the course of the week. But in many, the medical paper is of opinion, the stint is a simple meanness, a pitiful economy in respect of that which, it is supposed, will not be open to the criticism of observant friends.

Nuts.—Are nuts wholesome? Nuts are very rich food, containing much oil, in such a state that it is not easily acted on by the gastric juice unless minutely divided before heing passed to the stomach. Thoroughly chewed, however, they are wholesome for persons with good stomachs. Children may eat nuts freely to advantage, but care should be taken to choose fresh ones. Stale, old, overdried nuts are very indigestible and injurious.

Keep Active.—Never sit down and brood over trouble of any kind. If you are vexed with yourself or the world, this is no way to obtain satisfaction. Find yourself employment that will keep your mind active, and, depend upon it, this will force out unwelcome thoughts,

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Boswell's Combined Heater, Cooker, Baker, Clothes and Fruit Drier. Coin Silver Tableware Given Away, Eagle Gold and Silver Plating Co., Cincinnati, Ohio.

The Week.

Resumption of specie payments is now guarded by law. No great and exciting catastrophe occurred on the day fixed for resumption. Some people seemed to think there would be a grand movement of some kind—of what kind it is hard to imagine. Sherman was to be in New York to see resumption commenced, rumored those visionaries. But here we are on a foundation of golden honesty, and people do not realize that anything startling has occurred. Nor will they until a year or so brings unknown prosperity, and the students of economy begin to point back to January 1st, 1879, as the beginning of the "golden era." Among the events of the week is another, which reflects more credit upon the popularizing, anti-speculator policy of Sherman. Gold is to be purchased at Helena, Montana, directly from the miners and others who have it to sell, in exchange for greenbacks at par. The Department is buying gold on similar terms at Charlotte, N. C., at Boise City, and Denver. The startling claims on the Bodie mining property will be referred to in another column. As far as present developments go, the whole affair shows a rather astonishing carelessness and neglect on the part of men who have been thought capable of taking care of themselves.

THE recent discoveries of rich silver mines near Tucson is creating excitement among our miners.

THE Reno *Journal* reports encouraging news from the Mansanola mines.

Arizona.

The event which promises most for the New Year is the opening of Arizona by the Southern Pacific railroad. The whole commercial world will be enlivened by it; the mining industry in all its branches will be enlarged and strengthened; new problems will be brought more forcibly than ever before our people—problems to test the ability of our engineers, both those who bear the transit and leveling rod, and those who map out our courses in legislative halls.

"Over-production" is the cry among our manufacturers to-day. The spectacle of England, shutting down her factories and turning thousands of employees out into the cold of an unusually severe winter, is fraught with inevitable lessons. And we all know that we do not have to go across the Atlantic to be reminded that markets are stagnant. In the heat of competition, and the clatter of new labor-saving machines, men have made more than they can sell. And now every eye is straining to discover some outlet, be it ever so small, through which to crowd the stock from bending shelves and overfull warehouses.

And not a few faces are turned towards Arizona. Now Arizona is not a gigantic glutton, to swallow the surplus of the world. She is not yet developed sufficiently to send in lengthy orders to the merchants and manufacturers of her sister States and Territories. And were she so, her spirit is too plucky to admit of long dependence upon others. But these are facts: Arizona has vast territory unsettled, and great resources undeveloped. She has, moreover, an energetic population within her borders, who realize the richness of her possessions, and have a press through which they are not slow in publishing them abroad. Add to this a railroad, pushing up one of her richest valleys, and symptoms of new wagon roads from the principal towns to join with it. Then we have all the requisites for a considerable demand upon outside markets, for at least a space of several years. Arizona will soon stand alone. The few Mormon shuttles on the Colorado Chiquito will in short time grow into a woolen mill. Then no longer need the sheepraiser pay freights out on his wool, and freights in again on his shirts and stockings. Already the home product of flour is sufficient to have established a reputation among the camps. It will not be a great while before the furnaces in the mountains will be made of Arizona brick; and who shall say that the mill-machinery shall not be forged with Arizona coal, if not made of iron mined within the Territory. But for the present, Arizona must draw largely from California, and through California from the East. San Francisco foundries must do most of her iron work; California mills must grind her flour; and houses in our cities must import most of her manufactured goods of all classes. This is how Arizona, with a railroad, will make herself felt in the commercial world.

That the opening up of Arizona will enlarge and strengthen the mining industry, need not be enlarged upon. Arizona is thought of in the outside world as pre-eminently a mining country. The fame of her mines has gone forth until it is almost forgotten that she has verdant valleys for agriculture and hillsides to support a large grazing industry. It is not necessary at this late hour to detail the silver and gold regions, the mines of copper, lead, iron, cinnabar, and coal. What the people want to know now, is whether there will be food for the miners, and any reasonable supply of the comforts of life. The Arizona press will do more good by attending now to these matters than by dwelling on the mineral resources, which are already widely known and undoubted. Assure the miner that he will not starve, and he will try his luck despite stories of desert and of hostile Indians. This assurance comes when Arizona is vitally connected with great centers of supply. Exploration of little-known districts may be now looked for. New discoveries will be reported every day, as they have been lately almost every week. And upon the track of discovery, capital may now follow with more confidence than ever before, bringing all the good things of capital, roads and smelting works and mills.

The growth of Arizona will bring up many important problems before the United States. Immense engineering feats will be dwelt upon in council if not carried out. The irrigation of the "deserts" is a question that is nearer the people to-day than ever before. But there is another question of more vital and general importance; it concerns our relations with Mexico. Mexico is attracting no little attention to-day. The excursion of Eastern traders shows both the fact and its significance. Mexico has resources, if they are almost entirely latent, and held back by revolutionary laws and all their attendant evils. It will profit us to have closer relations with her. That is what the New Orleans excursion means. It is now settled that our trade with Mexico cannot grow without an international railroad. Is this railroad to go down through Texas, New Mexico or Arizona? We think the question is almost answered in the progress of the Southern Pacific. Our coast is more nearly related to Mexico than any other part of the country. Every effort should be made to turn the prospective trade into our channels. So Arizona shall prove not only a desirable end in herself, but a means to an end as well.

The Metallurgy of Mercury in California.

We acknowledge the receipt from the author, M. Georges Rolland, Ingenieur an Corps des Mines, of an interesting monograph with the above title, reprinted from the publications of the *Societe d'encouragement pour l'industrie nationale*. The article is the result of a tour through the quicksilver mines of California during the year 1876. The author promises that he will shortly treat of the "Deposits of Mercury in California," in an article to appear in *Annales des Mines*. He promises at the same time to publish the statistics which he gathered in his trip, as to the phases of production in California, the consumption of it on the Pacific coast, its exportation to China, to Mexico, etc., and finally the fluctuations of the price of the article in San Francisco.

The author gives to the Americans the credit of having invented a great number of new arrangements, some of them very ingenious. The reason of this is, of course, as the author claims, partly due to the great cost of manual labor, and also to the recent fall in price of the article itself, which requires the strictest economy in its production. He, however, very justly criticises the neglect of the custom of carefully taking samples and making assays of all the ores treated. New Almaden, as far as we know, is the only mine at which this was ever attempted in anything like a systematic manner, and here we regret to say, it was not continued. Although the careful taking of samples, and the making of assays of an ore costs considerable care and money, without adding to its richness, still the exact knowledge of condition of the whole metallurgical operation which is thus obtained, the control it gives in case of otherwise undiscoverable losses from accident or theft, etc., is certainly worth more than 10 times its cost. This is more particularly so in the case of a valuable metal like quicksilver. It is to be hoped that our quicksilver metallurgists will no longer thus work in the dark. There are many interesting and technically valuable questions that can be settled in no other way.

In the article of which we speak the works of only the three principal mines, are treated at any length: those of New Almaden, Redington and Sulphur Bank. As we have neither time nor room for the whole article, we can only speak of some of the principal points.

Retort furnaces, in which cinnabar is heated with lime, are generally abandoned in California, and are only used in the treatment of mercurial soots. The intermittent furnaces hitherto in use in California are generally replaced by continuous furnaces with improved systems of condensation. Continuous and automatic furnaces have been invented for fine ore, thus enabling the expeditious treatment of fine ore, without manufacturing it into bricks.

For the treatment of coarse ore, the author speaks in the following terms of the improved iron-clad Idria shaft furnace in use at New Almaden:

"The movement of the ore and the gases in the furnace in opposite directions, is a rational idea. The gases and vapors escape at the top at a low temperature. The roasting and the distillation of mercury take place at the lower part. The furnace, as its name indicates, is surrounded by a metallic casing." * * * *

"It may be affirmed that the loss in the treatment of ores in this furnace, at New Almaden, is less than that of any other establishment in California."

The furnace of Livermore, at the Redington mine, and that of Hutner and Scott at the New Almaden, are described in full. We would give the relative costs of treatment in the various styles of furnaces as furnished in the articles, except that such could not be made the basis of any comparison without a knowledge of the richness of the ores (treated), and the exact loss during the operation.

The arrangements for condensation, particularly those of New Almaden and Knox and Osborne, are described in full. The arrangements at New Almaden show the greatest amount of care and forethought in their construction. There are first large brick chambers to take the hot gases and vapors, and to allow their expansion and cooling. They then pass into the iron condensers of Fiedler, cooled by water upon the top, and by hollow partitions containing the same material. Thus cooled, the vapors pass into the condensers of wood and glass, invented by Fiedler & Randol, and thence by an extensive system of flues and chimneys, to the top of the neighboring hills.

In 1876 the author states that the furnaces of the Sulphur Banks produced a greater quantity of mercurial soot than any other establishment in California. This amount was greater than 1.5% of the ore treated. The cause was the imperfect drying of the ore before roasting, and the partial roasting. The soot contained not less than 40% of mercury on the average; contained much sulphur, partly fine, partly in the state of sulphide of mercury. The ore at the Sulphur Bank, very much broken, very wet, very bituminous, and above all supersaturated with sulphur, offers, it is true, special difficulties to the operations of drying and roasting, and its low contents hardly justify the expense of a preparation which would be very great.

THE Aqua Fria smelter has just turned out from Silver Belt ore seven tons of base bullion, worth perhaps $5,600.

Automatic Rotary Gas Mixer.

The electric light has so many chances of success, that attention is being called to all plans that may aid the gas companies in making use of their product for heating and cooking purposes. In 1875 an automatic rotary carbureter was patented by T. A. Stombs, through the MINING AND SCIENTIFIC PRESS Patent Agency, which in this connection demands special notice now.

The machine consists of a cylinder divided into two apartments by a diaphragm parallel to the base. In each apartment is a fan wheel, which turns upon a shaft passing through the axis of the cylinder. The fans of the wheels are covered with blanket or other suitable material, when the machine is to be used as a carbureter. The blanket is arranged on a frame, so as to pass from the circumference to the center, on one fan, and back to the circumference and over the next fan, and so on. When making heating gas, no blankets are necessary, the bare fans being sufficient. Water, or, if the machine is to be used as a carbureter, gasoline or some other suitable material, is put into the larger apartment of the cylinder, which rests horizontally, and rises to a certain hight, regulated by an automatic valve.

The air is admitted near the shaft, but is conducted by a pipe up to a point above the surface of the liquid, where it is discharged into the cylinder. The wheel revolving, the fans catch the air, and tend to force it beneath the surface of the liquid. However, the fans are slightly inclined on the shaft, so that as each fan comes around the edge nearest the inlet strikes the liquid first, and continuing to pass downward, pinches the air, and finally forces it out towards the diaphragm, near which is an outlet.

The smaller apartment of the cylinder, on the other side of the diaphragm, contains the driving wheel. This is a fan wheel arranged so that air or gas under pressure will revolve it, the gas being finally forced out through a pipe near the diaphragm, and parallel to that through which the air escapes from the other apartment.

Now it is suggested that this apparatus be used for mixing air with gas that is to be employed for heating or cooking. The machine may be connected with the gas pipes between the meter and the point of consumption, no changes being necessary in the present system of delivery. The amount of air necessary for a given amount of gas can be regulated by governing the relative sizes of the two apartments in the cylinder. It is claimed that gas taken into the driving apartment at two inches water pressure, will run the machine. As the gas revolves the driver, the fan-wheel in the other apartment will suck in air and deliver it through the pipe parallel to the gas pipe. The air and gas in correct proportions will thus proceed in separate pipes to the point of consumption, where at the proper time they will mix. The machine, it is said, may be built to supply any number of burners, from one to 1,000, and at all times producing a mixture containing the desired proportions of gas and air.

And now as to the economy of using heating gas as a fuel, in the parlor grate or in the kitchen stove. Suppose the mixture is to contain four parts of air to one part of coal gas. The cost of 1,000 cubic feet of the mixture would be as follows:

1,000 feet coal gas at works.....	$2.25
4,000 feet air at machine.....	—
5,000 feet heating gas.....	2.25
1,000 " " "	45

The heating gas could, then, be delivered to the consumer at 45 cents per 1,000 feet. We will compare this now with the cost of coal as a fuel.

To keep a fire in a grate for 6 hours in 24 would require 10 lbs of coal. Say that the coal used costs $9.00 per ton, or 45 cents per 100 lbs, 10 lbs would cost 4½ cents. The fire would cost per month $1.35.

In using gas suppose three 2-foot burners were employed, consuming together 6 feet per hour, 36 feet per 6 hours, or 1,080 feet per month. This, at 45 cents per 1,000 feet, would cost 48½ cents per month. This shows a saving in favor of gas of 86½ cents per month per grate, or 64%.

The inventor says, that the gas can be used to the full capacity of all the burners, or, of only part of them. The consumption can be controlled just as it is in the use of ordinary gas. There is no soot, ashes, dirt. The combustion is perfect, so no flues are necessary, and in the place of them in a grate, may be set a bright metal reflector, to send the heat out into the room. In the ordinary grate 50% of the heat goes up the chimney with the smoke.

With this machine, heating gas can be made from gasoline, or even from heavy unrefined coal oil at a still less cost. For instance, one ton of coal worth $10 per ton will produce 10,000 feet of gas. The same amount of gas may be produced by 50 gallons of coal oil, which, at 16 cents per gallon, would cost $8. One thousand feet of this gas would cost then 80 cents. One thousand feet of heating gas made from it, by mixing four parts of air with one of gas, would cost 16 cents; 10,000 feet would cost $1.60, which is a saving of $8.40 for every ton of coal used.

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SAN LORENZO, December 6th, 1877.
MESSRS. DEWEY & CO.—*Gentlemen:* I received the Letters Patent for my invention on the 5th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully, WM. DALE.

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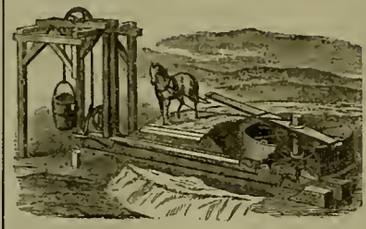

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The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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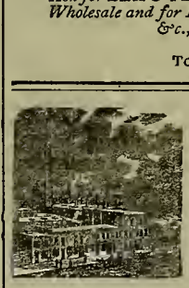

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DEFLECTORS,

Or Perkins vs. Hoskin.

W. H. PERKINS has for nearly two years been threatening orally and through the Press to prosecute all persons using my Patent Deflecting Nozzle, but for *good reasons*, has failed to come to time. I want miners to understand that Deflectors are still manufactured and sold, and that I will defend all suits and assume all responsibility. Mr. P. will confer a favor if he will carry out his threat, as it will afford me the opportunity I desire to again try the case, and he can rest assured that *professional dodges* will not again be allowed to *temporarily* thwart the ends of justice.

I feel confident that the Supreme Court of the United States will ultimately decide in my favor. The superiority of my invention is shown by the means which Mr. P has resorted to in trying to stop my sales. Mr. P. has so degraded himself as to circulate statements which he knows to be *false and malicious.* Notwithstanding the great number of my Deflectors in use, I have heard of but one accident, and this was caused by the breaking of the iron lever from a defect in the material and great carelessness in use. This circumstance Mr. P. has magnified into several deaths and numerous accidents. I refer to the following owners and Managers for testimonials as to safety and efficiency. Some of them have used and discarded Mr. Perkins' device in favor of my much superior one. Messrs. Gould, Gold Run, using 4; Spaulding, Dutch Flat, on different mines, 12; Stone, Gold Run, 2; Morgan, Little York, 6. Bisbee, Iowa Hill, 2; Briere & Wheeler, Bath, 2; Mr. Gillvary, Forest Hill, 4; Atkins, Weaverville, 2. I could mention scores of others, but these are sufficient.

Mr. Perkins' device is an infringement on a patent owned by Mr. Craig, who is about to institute legal proceedings to protect his rights. Miners are advised to stand from under. A word to the wise is sufficient. R. HOSKIN,

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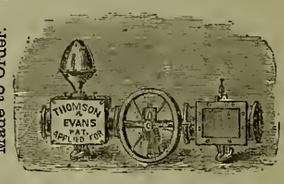

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The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

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News in Brief.

TARTAR agitation in Russia.

TROUBLES with students in Russia.

THE Oldham cotton operatives' strike is over.

VIRGINIA CITY shows further signs of settling.

A QUESTION is heing raised on the land titles of Bodie.

SENATOR SARGENT'S health is rapidly improving.

THERE are 6,000 unemployed persons in Geneva.

THE recent fatal epidemic has disappeared from Geneva.

Two flonring mills destroyed hy fire at Black Rock, near Buffalo, N. Y.

THE final appeal of the Spanish would-he regicide is reported rejected.

GREECE is pleased with the actiou of ths Porte in appointing a frontier Commission.

SEVERAL arrests have heeu made of the Breathitt county, Ky., desperadoes.

A WELL-KNOWN resident of Washington, died from the effects of the hite of a man.

E. L. PIERCE, of Boston, has heen appointed Assistant Treasurer of the United States.

A HOTEL keeper has been arrested at Copenhagen for threatening to shoot the King.

THE Captain and officers of the steamship *Pomerania* have heen acquitted of blame.

A GERMAN paper suggests that 15,000,000 marks rcvenue might be raised on petroleum.

THE Blaine Committee of Investigation has adjourned until the reassemhling of Congress.

THE German Fishery Verein will hold an international exhihition at Berlin iu April, 1880.

GREAT preparations are making at the City of Mexico for the reception of the American excursionists.

A CHANGE of management is ahout to occur in the hranch of the Bank of British Columhia at San Francisco.

THE people of Ceara, Brazil, are dying at the rats of 600 daily of small-pox, and the distress is appalling.

IT is stated that 40% of the Bosnians who have returned home will perish hefore spring unless the weather moderates.

MONCASI, who attsmpted to kill King Alfonso, has heen finally coudemned to death hy the Supreme Court of Justice of Spain.

SEVEN immense electric lanterns have heen ordered at Paterson, N. J., by the Russian government, for use on men-of-war.

FLOOD, of the honanza firm, sent Christmas checks for $1,000 each to the San Francisco orphan asylums, and of $500 each to the henevolent societies.

A TRAIN was attacked hy robhers between the City of Mexico and Vera Cruz, who killed the baggage-master, wounded the conductor and escaped with $27,000 in silver.

The Pig Iron Market.

William Jeffray, metal and coal hroker, 204 California street, seuds us his review of the year 1878, from which we extract the following: In Jauuary, Scotch, soft, was quoted at $30 to $31, the highest duriug the year. The lowest quotations were in Octoher, viz: $25 to $26.50. Decemher quotations were, $26 to $27. English and American, white, show a constaut falling off, from $28 in January, to $25.50 in October, November and December. American, soft, was $28 to $29, in January; in Novemher, it was $22 to $26; Decemher, $24 to $26.

I find the stock of pig iron on hand January 1st, 1879, in all, 14,370 tons, as per statement given helow, heing 2,995 tons less than the stock on hand January 1st, 1878.

Stock of pig iron on hand January 1st, 1878, 17,365 tons. Importatious of 1878—Scotch, soft, 2,107 tons; importations of 1878—American, eoft, 7,235 tons; importations of 1878—American, white, ——; importatious of 1878—English, white, 1,705 tons; total importatious of 1878, 11,047 tons. Grand total, 28,412 tons.

The ahove figuree show a decreased cousumption this year as compared with last of 1,521 tons, viz: 3,312 tons of soft Scotch, and increase of 430 tons of white, and 1,355 tons of American soft.

The importations of 1878 show a decrease of 6,425 tons as against the importations of 1877.

TRANSMISSION OF HEAT BY STEEL AND IRON PLATES.—In a letter addressed hy Mr. John Collins to *Engineering*, that gentleman gives the following data derived from experiments made to ascertain the relative heat conductivity of iron and steel plates. The apparatus consisted of exactly similar plates of steel or iron 11⅝ square, .23 in. thick, supported on glass legs, heated hy a Bnnsen hurner consuming equal quantities of gas, maintained at 2 iu. pressure coustantly, aud a hasis 3 in. in diameter placed iu the center of the plate, containing mercury iu which a delicate thermometer was immorsed. The temperatare of the mercury was theu raised from 20° C. to a 160° C., and relativo times uoted. The average gain in time of steel over iron plates of equal thickuess is 13%. When the relative thickuess of tho plates as used in hoiler huilding is taken, this gives au average gaiu of ahont 20%. Iu steam hoiler trials, where hoilers are similar in all respects, say thickuess and material, the actual gain iu working 20 days of 12 hours each shows actual evaporative power of 20% in favor of steel. In another series of a similar nature hy Stuckentholtz, the results gave 19.6% and 20.8% in favor of steel.

Improvement in Iron Smelting.

The Horicon Iron Co., of Tioonderoga, N. Y. according to the *Polytechnic Review*, Nov., 1878, is sngaged in manufacturing, hy a modification of the Catalan force process, hlooms which are said to prove equal in uniform excellence to the Swedish and Norway irons. The peculiarities of the process are chiefly the two following: The ors, instead of heing thrown cold upon the forge-fire, descends through a retort or chamher in the rear, into which it has heen charged, mixed with charcoal braize. By the time it has reached the bottom of this chamher, and is raked forward into the fire, it is not only thoroughly heated, hut is also reduced to metallic sponge. The chamber is heated hy the flame-products of the forge-fire, and also by the combustion of carhonic-oxide, generated from the forge and hraize, and escaping through the ports in the wall, to hurn in the surroundiug flue. This arrangement is the first peculiarity of the process. The second is the charging of the very fine ore-dust into another chamher where it is pre-heated, and then taken by a screw-conveyor and carried through a hollow journal and a small gas-pipe into the tuyere, which conveys it into the forge-fire and deposits it upon the surface of the loup. In this way a great loss of fine ore is avoided, and a saving of fuel is effected. There is still another peculiarity in these works, affecting the suhsequent manipulation of the blooms. The loup is introduced into a Sweet's furnace, and thoroughly heated hefore shingling. In this way, it is claimed, a more complete removal of cinder, etc., is secured. Certainly the hlooms and billets which we saw treated exhihited great solidity and uniformity under the hammer. The capacity of the four fires now in operation is abont four tons daily—eight loups heing taken out of each during the twenty-four hours. The works have heen hut a few days in operation on this plan, but the experiment promises to he successful, and, if commercial results warrant, the capacity will he at least douhled. The ore now used is the Bessemer magnetite of the Crown Point Iron Co.; hut the Horicou Co. possesses extensive deposits of its own, upon which it cau fall hack if necessary.

Bullion Shipments.

Since onr last issue, we have noticed the following shipments of hullion:

Arizona.—Mineral Park Mill, Mohavs couuty, $4,400. Tiptop, $23,000.

California.—Bodie, Dec. 23d, $12,300. Extra, Dec. 22d, $1,400; Dec. 25th, $1,660. Standard, Dec. 25th, $17,750.40.

Colorado.—The Black Hawk *Post* says: The hullion shipment from Gilpin county hy the Union Pacific express company, for the month of November, is as follows: From Hill's smeltiug works, gold, $90,000; from the mills, gold, $105,700, aud silver, $103,800.

Idaho.—Silver City, Dec. 15th, $9,830.27.

Nevada.—Alcxander, Dec. 24th, $9,556.02; California, Dec. 28th, $121,335.49; total to date, $638,806.72. Eureka—*Sentinel*, of Dec. 25th, reports a shipment of $1,311.98. Hillside, Dec. 31st, $5,219.00. Jefferson, Dec. 23d, $2,169.87. Leopard, Dec. 29th, $8,300. Manhattan, Dec. 23d, $11,000. Navajo, Dec. 25th, $5,267.78. Northern Belle, Dec. 25th, $2,802.58. Trojan, Dec. 27th, $10,043.04; total this month, $18.221.24. Tybo Con., Dec. 25th, $3,947.31.

Utah.—Christy Con., Dec. 27th, $6,093; Ely Mill, Dec. 21st, $900; Dec. 24th, $1,100; Ontario, Dec. 20th, $2,568.57; Dec. 21st, $2,732.25; Dec. 23d, $5,112.07; Dec. 24th, $2,348.83; Silver Reef, Dec. 20th, $5,526.31; Dec. 24th, $11,515.59; Dec. 26th, $4,399.92. The *Miner* gives the total shipments hy Wells, Fargo & Co., for the week ending Dec. 21st, at $22,073.80.

TEMPERING NICKEL.—Nickel, like iron, ie magnetic, sufficiently ductile to he forged and drawn into slender wire. Its point of fusion is very high, and if melted in a *brasque* crucible it yields a homogeneous regulus of a silvery whiteness, containiug carhon. M. Boseingault has examined whether nickel, like iron, when carhureted, is capahle of being tempered and acquire elasticity, and whether it rendere steel less susceptihle of oxidation. The result was decidedly negative except that alloys of iron and steel, with large proportions of nickel, 30% and upward, resist the oxidizing action of air aud water.

THE Highhridge mill works up the ore to a trifle over 95% aud the yield per tou exceeds expectatious.

DURING this year 313 mining claims have heen recorded in the Recorder's office of Bodie district.

H. J. T. SCHEEL has taken out of his little gold vein in Gold Canyon, Lyon county, Nev., 23 tons which has yielded $18,000.

THE strike in tho Last Chance mine is one of the richest ever made iu Silver Reef district.

THE Crosscut, in Humhug district, is developing one of the largest aud richest mines in Yavapai county.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING DECEMBER 17TH, 1878.

CLIPS FOR ROPE TRAMWAYS.—Andrew S. Hallidie, S. F.
BREECH-LOADING FIRE-ARMS.—Julius Bluemel, S. F.
ORE STAMPS.—Stephen Kendall, Jackson, Cal.
WAGON JACKS.—Harris H. Margeson, East Oakland, Cal.
WINDMILLS.—Thomas E. Martin, San Joss, Cal.
BITTERS.—Trademark—Charles R. Burrags, S. F.
CHOCOLATE, BROMA AND COCOA.—Tradsmark—Domingo Ghirardelli, S. F.

Notices of Recent Patents.

Among the patents recoutly obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Ageney, the following are worthy of special mention:

DREDGING AND DITCHING MACHINE.—Daniel Bridges, Yoncolla, Douglas county, Oregon.—Dated Dec. 3d, 1878. The invention is an improved drcdging and ditching machine, and the improvements consist in a novel combinatiou of mechanism hy which the inventor is enahlcd to cut out and lift the earth by the vertical action of the dredging bucket; and in certain details of construction, the machine can he made on a small scale to he worked by hand for ditching purposes or may he made large to he worked hy steam power for reclamation purposes. It will operate in any earth stiff enough to hold together without falling between the forks of the grapple. For softer matsrial a plato of metal is used instead of forks. Ths device is intended more particularly to construct ditches or dikes on marsh swamps, tule or tide lands where there is little or no fall to the grouud, and where the marshy character of the soil is such as to preclude the use of horse power. The devics is used to hest advantago on a scow, being operated by hand or steam power. It has heen practically and successfully tested in Oregon hy the inventor.

SPARK ARRESTER.—J. H. Bartlett, Woodland, Yolo county.—Dated Dec. 10th, 1878. This invention relates to a novel apparatus to he applied to the smoke stacks of hoilers and engines, whereby the inventor is enahled to arrest the sparks which would ordinarily he thrown out hy the force of the exhaust steam or draft, aud which are dangerous when used in the harvesting field or among stuhhle, or in any place where there are combustihles which are liahle to hecoms ignited. It consists in the employment of spiral or screw-shaped directing wings having their axis placed eentrally in the stack, and these wings are bent over at the top, so as to form a sort of cup, into which the sparks, following the incline of ths screw, will strike and he conveyed hy pipes hack into the smoke hox.

PULVERIZING BARREL.—John C. Senderling, San Francisco.—Dated Dec. 3d, 1878. This invention relates to certain improvements in crushing and pulverizing barrels or that class of apparatus in which halls, rollere, ehoes, hammers, etc., are employed to crush and pulverize rock within a rotating cylinder or harrel. It consists in the employment of a iron rotating, etationary or adjustahle shaft, passing through hollow trunnions of the harrel, and having arme attached for the purpose of holding rollere or shoes in position. The said rollers or shoes may thus he held at a certain point, and as the ore is fed into the harrel it passes between the rollers or shoes and the inner periphery of the cylinder or harrel. The pulverized ore will escape through perforations or slots in the dies and from thence through the enclosing screens, while any particles not crushed sufficiently free will he returned to the cylinder.

LIGHT WEIGHT HORSE FORK.—Byron Jackson, Woodland, Yolo Co., Cal.—Dated, Dec. 3d, 1878. This inventiou relates to certain improvements in devices, known as horse forks, such as are employed to handle headed grain, and hay or straw. It eonsists in a novel eonstruction of the head in two pieces, and a light frame work having as many hars as there are tines on the fork, the two outeide hars heing united at one end, and diverging from each other at the opposite eud, to secure the outside tines. The other hars of the frame receive the inner tines at one end, and are united at the other end to the outside bars. One end of each of the hars of this frame is locked hetween the two head pieces, hy the tines passing through them. The tines heing shouldered ou a light frame brace on one side, aud a nut screwed down on the other. The braces are cast rolled to a bar of the frame, thus hringing the strain of each tine lengthways with each har of the frame. There is then no twisting etrain on any portion of the frame or head, as ie the case in the old methods of using a single head piece and clamping the lifting arms to it hy means of east or wronght iron hands. By this construction the weight is reduced nsarly one-half, while the same strength is retained.

AIR VALVE ATTACHMENT FOR SEWER TRAPS.—P. F. Morey, S. F.—Dated November 19th, 1878.—This valve is intsnded as a stop to prevent the return through the connecting pips of sswers of noxious vapors. We illustrated and described it in detail in the MINING AND SCIENTIFIC PRESS of March 9th last. It has heen extsnsively introduced here hy the manufacturer, David Bush, 27 New Montgomery street.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are mors popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Lifs Insurance Co., of Newark, Nsw Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Cobls, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

ARTESIAN WELLS WANTED.—Parties who ars prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of ths Reading Ranch, Anderson, Shasta County, Cal.

MODEL MAKER AND MACHINIST.—I. A. Heald, No. 51½ Commercial St., San Francisco, (fourth floor.)

A FLOURING MILL is wanted at Reading, ths head of railroad transportation in Shasta County.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., January 2, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, tou	26 50 @— —
Refined Bar	2¾@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

TUESDAY M., December 31, 1878

CARGO PRICES OF REDWOOD.		PUGET SOUND PINE RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Laths	3 50
Surfaced	20 00	Furring, lineal ft	½
Refuse	14 00	REDWOOD. RETAIL PRICE.	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, January 2, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., par. SILVER, 2@2½. GOLD in New York, par.

GOLD BARS, 890@910. SILVER BARS, 8@22 ℘ cent. discount.

EXCHANGE on New York, 35, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 88@90.

LONDON Consols, 94 7-16; Bonds, 108½.

QUICKSILVER in S. F., by the flask ℘ lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending December 31, 1878.

Dec 25	Dec 20	Dec 27	Dec 28	Dec 20	Dec 30	Dec 31
HIGHEST AND LOWEST BAROMETER.						
30.12	30.24	30.13	29.91	29.95	29.79	20.80
30.00	30.15	29.93	29.85	29.84	29.72	20.72
MAXIMUM AND MINIMUM THERMOMETER.						
52	51	51	51	50	54	53
41	41.3	40	44.5	40.5	44	46
MEAN DAILY HUMIDITY.						
63.3	47	01	40.7	53.3	64	75.3
PREVAILING WIND.						
E	NE	NW	NE	NE	E	NE
WIND—MILES TRAVELED.						
131	128	98	159	129	172	279
STATE OF WEATHER.						
Clear.	Clear.	Clear.	Fair.	Clear.	Cloudy	Rainy
RAINFALL IN TWENTY-FOUR HOURS.						
					.04	.31

Total rain during the season, from July 1, 1878, 2.98 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of December, A. D., 1878, an assessment (No. 40) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of January, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 18th day of February, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco California.

Land Purchaser's Association. — Office,

No. 318 Montgomery Street, San Francisco, California.

NOTICE -There are delinquent upon the following described stock, on account of assessment (installment No. 43) levied on the 5th day of November, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Mrs Matilda Stohr.....	38	1	$4 00
James L Beyea.....	43	1	4 00
V Chevallier.....	64	1	4 00
Geo S Dickey.....	98	1	4 00
W G Koch.....	178	1	4 00
Asa Fisk.....	220	1	4 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of November, 1878, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Secretary, No. 318 Montgomery street, San Francisco, California, on Saturday, the fourth (4th) day of January, 1879, at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

C. S. WRIGHT, Secretary.

Mineral Fork Mining and Smelting Com-

pany.—Location of principal place of business, San Francisco, California. Location of works, Big Cottonwood District, Salt Lake County, Utah Territory.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 31st day of October, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
G Areskog.....	156	50	$ 1 00
G Areskog.....	157	50	1 00
W H Atwood.....	185	100	2 00
W H Atwood.....	186	100	2 00
W H Atwood.....	187	100	2 00
W H Atwood.....	188	100	2 00
W H Atwood.....	189	100	2 00
Wm Atwood.....	100	100	2 00
Wm Atwood.....	191	100	2 00
Wm Atwood.....	102	100	2 00
Wm Atwood.....	193	100	2 00
Wm Atwood.....	194	100	2 00
C Bearson.....	105	100	2 00
O Bearson.....	115	100	2 00
G Bearson.....	110	100	2 00
G Bearson.....	117	100	2 00
O Bearson.....	118	100	2 00
G Bearson.....	119	100	2 00
G Bearson.....	130	66	1 32
H L A Culmer.....	295	50	1 00
H L A Culmer.....	296	50	1 00
H L A Culmer.....	297	100	2 00
H L A Culmer.....	298	100	2 00
H L A Culmer.....	299	100	2 00
Wm H Culmer.....	378	10	20
Wm H Culmer.....	379	50	1 00
Wm H Culmer.....	380	50	1 00
Chs G Denicke.....	434	50	1 00
Chs G Denicke.....	435	50	1 00
Chs G Denicke.....	436	50	1 00
Chs O Denicke.....	437	50	1 00
A S Easton.....	4	75	1 50
A S Easton.....	365	350	7 00
E E Elliott.....	195	100	2 00
E E Elliott.....	196	100	2 00
E E Elliott.....	197	100	2 00
E E Elliott.....	198	100	2 00
E E Elliott.....	201	17	34
E E Elliott.....	271	25	50
E E Elliott.....	272	25	50
E E Elliott.....	274	10	20
E E Elliott.....	275	10	20
E E Elliott.....	217	50	1 00
E E Elliott.....	218	50	1 00
E E Elliott.....	220	50	1 00
E E Elliott.....	222	200	4 00
E E Elliott.....	224	200	4 00
E E Elliott.....	225	200	4 00
E E Elliott.....	226	200	4 00
E E Elliott.....	228	200	4 00
E E Elliott.....	229	200	4 00
E E Elliott.....	230	200	4 00
E E Elliott.....	231	200	4 00
E E Elliott.....	233	100	2 00
E E Elliott.....	234	100	2 00
E E Elliott.....	371	50	1 00
E E Elliott.....	372	50	1 00
E E Elliott.....	373	50	1 00
E E Elliott.....	374	50	1 00
E E Elliott.....	375	100	2 00
E E Elliott.....	376	100	2 00
E E Elliott.....	377	100	2 00
E E Elliott, Trustee	503	10	20
E E Elliott, Trustee	504	10	20
E E Elliott, Trustee.....	505	10	20
E E Elliott, Trustee.....	506	10	20
E E Elliott, Trustee.....	507	10	20
E E Elliott, Trustee.....	508	10	20
E E Elliott, Trustee.....	509	10	20
E E Elliott, Trustee.....	510	10	20
E E Elliott, Trustee.....	511	10	20
E E Elliott, Trustee.....	513	10	20
E E Elliott, Trustee.....	514	10	20
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E E Elliott, Trustee.....	525	10	20
E E Elliott, Trustee.....	526	10	20
E E Elliott, Trustee.....	527	10	20
E E Elliott, Trustee.....	528	25	50
E E Elliott, Trustee.....	529	25	50
E E Elliott, Trustee.....	530	25	50
E E Elliott, Trustee.....	531	25	50
E E Elliott, Trustee.....	532	25	50
E E Elliott, Trustee.....	533	25	50
E E Elliott, Trustee.....	534	25	50
E E Elliott, Trustee.....	535	25	50
E E Elliott, Trustee.....	536	25	50
E E Elliott, Trustee.....	537	25	50
E E Elliott, Trustee.....	538	50	1 00
E E Elliott, Trustee.....	539	50	1 00
E E Elliott, Trustee.....	540	50	1 00
E E Elliott, Trustee.....	541	50	1 00
E E Elliott, Trustee.....	542	50	1 00
E E Elliott, Trustee.....	543	50	1 00
E E Elliott, Trustee.....	544	50	1 00
E E Elliott, Trustee.....	545	50	1 00
E E Elliott, Trustee.....	546	50	1 00
E E Elliott, Trustee.....	547	50	1 00
E E Elliott, Trustee.....	512	10	20
W W Elliott.....	208	100	2 00
W W Elliott.....	209	100	2 00
W W Elliott.....	210	100	2 00
Frank Foote.....	381	250	5 00
B A M Troisith.....	568	20	40
B A M Troisith.....	569	20	40
Edwin Gardner.....	202	100	2 00
Edwin Gardner.....	203	100	2 00
Edwin Gardner	204	100	2 00
Edwin Gardner	205	100	2 00
Edwin Gardner	206	100	2 00
S J Jonasson.....	181	25	50
S J Jonasson	182	25	50
S J Jonasson.....	184	67	1 34
Peter Jhonson.....	333	100	2 00
Peter Jhonson.....	334	100	2 00
Peter Jhonson.....	336	100	2 00
Peter Jhonson.....	338	100	2 00
Peter Jhonson.....	340	100	2 00
Peter Jhonson.....	342	100	2 00
Peter Jhonson.....	346	50	1 00
Peter Jhonson	348	50	1 00
Peter Jhonson.....	349	50	1 00
Peter Jhonson.....	350	50	1 00
Peter Jhonson.....	351	50	1 00
Peter Jhonson.....	353	50	1 00
Peter Jhonson.....	354	50	1 00
Peter Jhonson.....	355	50	1 00
Peter Jhonson.....	357	50	1 00
Peter Jhonson.....	358	50	1 00
Peter Jhonson.....	359	50	1 00
T F Nystrom.....	247	100	2 00
T F Nystrom.....	248	100	2 00
T F Nystrom.....	249	50	1 00
T F Nystrom.....	250	50	1 00
T F Nystrom.....	251	33	66
R B Noyes	270	300	6 00
Samuel Purdy.....	259	100	2 00
W C Pease, Trustee.....	607	18	36
W C Pease, Trustee.....	608	18	36
C Peterson.....	75	100	2 00
G Peterson.....	85	100	2 00
C Peterson.....	87	100	2 00
C Peterson.....	88	100	2 00
G Peterson.....	89	100	2 00
G Peterson.....	96	50	1 00
G Peterson.....	100	50	1 00
C Peterson.....	102	50	1 00
William Russell.....	276	10	20
William Russell.....	277	5	10
William Russell.....	278	5	10
P H Sumner	19	5	10
P H Sumner	20	70	1 40
P H Sumner	180	66	1 32
Edgar Sheldon	291	250	5 00
Edgar Sheldon	292	250	5 00
Edgar Sheldon	293	250	5 00
Edgar Sheldon	294	250	5 00
F C Thompson	243	50	1 00
F C Thompson	244	50	1 00
F C Thompson	245	33	66
Theodore Tangwell.....	328	50	1 00
C F Winslow, Trustee	555	500	10 00
C F Winslow, Trustee.....	556	277	5 54
C F Winslow, Trustee	561	50	1 00
C F Winslow, Trustee	562	100	2 00
C F Winslow, Trustee	563	100	2 00
C F Winslow, Trustee.....	564	100	2 00
C F Winslow, Trustee.....	565	100	2 00
C F Winslow, Trustee.....	566	100	2 00
C F Winslow, Trustee	567	50	1 00
C F Winslow, Trustee	570	250	5 00
C F Winslow, Trustee	571	250	5 00
C F Winslow.....	237	5150	103 00
C F Winslow.....	301	1000	20 00
C F Winslow.....	308	1700	34 00
C F Winslow.....	309	1000	20 00
C F Winslow.....	310	1000	20 00
C F Winslow.....	311	1000	20 00
C F Winslow.....	312	1000	20 00
C F Winslow.....	314	250	5 00
C F Winslow.....	318	100	2 00
C F Winslow.....	324	100	2 00
Ronde N Walter.....	246	84	1 68
A Winguist	56	100	2 00
A Winguist	62	100	2 00
A Winguist	66	50	1 00
A Winguist	67	50	1 00
A Winguist	68	50	1 00
A Winguist	60	50	1 00
A Winguist	70	50	1 00
William Schade	24	50	1 00
William Schade	25	50	1 00
William Schade	53	100	2 00
William Schade	54	100	2 00
William Schade	55	100	2 00
Otto Metchke, Trustee....	609	14	28

And in accordance with law, and an order of the Board of Directors, made on the 31st day of October, 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, Room 20, Safe Deposit Building, No. 328 Montgomery Street, San Francisco, California, on Monday, the thirtieth (30th) day of December, 1878, at the hour of 12 o'clock M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale. OTTO METCHKE, Secretary.

Office, Room 20, Safe Deposit Building, No. 328 Montgomery St., San Francisco, California.

POSTPONEMENT.—The above sale has been postponed until Thursday, the 30th day of January, 1879, at the same hour and place. By order of the Board of Directors.

OTTO METCHKE, Secretary.

Orion Mining Company. — Location of

principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of December, 1878, an assessment (No. 4) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 13th day of January, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 28th day of January, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

Summit Mining Company.—Location of

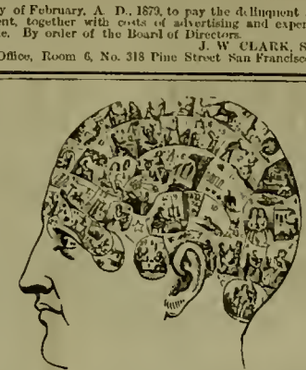
principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the nineteenth day of November, A. D., 1878, an assessment, (No. 6,) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of said Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the sixth (6th) day of January, A. D., 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the fourth day of February, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

J. W CLARK, Sec'y.

Office, Room 6, No. 318 Pine Street San Francisco, Cal.



Barlow J. Smith, M. D.

Consulting Physician,

Professor of Phrenology and Mental Hygiene.

Proprietor of the Smithsonian Medical and Phrenological Institute, 635 California Street, above Kearny.

This Institute, by combining medical hygiene with the various Water Cure treatments and the most powerful Electrized Horseshoe Magnet in the world, claims to cure speedily and permanently all forms of acute or chronic nervo-vital derangements, Brain, Spinal and Heart diseases, St. Vitus Dance, Palsy, Epilepsy and all Rheumatic, Liver and Kidney troubles. The institution has for the past 20 years made a specialty of treating all forms of weaknesses and diseases peculiar to males and females. By the use of hygienic remedies and electro-metropathy the worst forms of impotency and seminal weakness in males and sterility in females are speedily and permanently overcome. Hygienic board, with or without rooms. Terms moderate. Electro-thermal, Russo-Turkish and Medicated Baths given daily.

Mrs. Dr. Smith as Matron has charge of the female bathing department.

DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHEAL or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

Ladies or gentlemen, desirous of obtaining a thorough and correct Phrenological examinations with Fowler and Wells' charts, will meet with a respectful reception at his consulting rooms. Parties can depend upon a reliable delineation of the character of their intimate male or female friends, by presenting a clearly defined photograph.

Phrenological or Physiognomical examinations without charts, $1.50; with charts, from $2 to $3.

INVITATION TO INVALIDS

And all persons who are in any way out of health, who desire to know the nature and causes of their disease, may avail themselves of an examination through phrenology in regard to health free of charge, between the hours of 9 A. M. and 8 P. M. Sundays from 9 A. M. to 12 M.

Mill and Mining Machinery OF ALL KINDS For Sale by BERRY & PLACE

At the Old Stand, Market, head of Front Street, S. F.

Amusements.

BALDWIN'S THEATER.

THOMAS MACUIRE.....Manager.
F. LYSTER.....Acting Manager.
G. R. CHIPMAN.....Treasurer.

Open Every Evening with the Regular Company.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

CALLENDER'S GEORGIA MINSTRELS.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

MIGHTY DOLLAR.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

STANDARD THEATER.

M. A. KENNEDY.....Sole Lessee and Manager.

RICE'S SURPRISE PARTY.

Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.

ANNUAL MEETING.

The annual meeting of the stockholders of the Peacock Mountain Silver Mining Company will be held at the office of the Company, No. 306 Clay Street, San Francisco, at one o'clock P. M. on Thursday, the 9th day of January, 1879, for the election of a Board of Directors for the ensuing year, and the transaction of such other business as may properly come before the meeting.

ED. B. PARTRIDGE, Secretary.

Office, No. 306 Clay Street, San Francisco, Cal.

ANNUAL MEETING.

The annual meeting of the stockholders of the California and Oregon Land Company, will be held on Tuesday, January 14th, 1879, at 2 o'clock P. M., at the office of the Company, Room 6, No. 318 Pine street, San Francisco, for the election of a Board of Trustees, and the transaction of such other business as may properly come before the meeting. R. N. VAN BRUNT, Acting Sec'y.

Much Obliged, Etc.

PORTLAND, OREGON, June 26th, 1877.

DEWEY & Co., Patent Solicitors, S. F.—*Gents:* I am much obliged to you for courtesy shown me, and am much pleased with the manner in which you have done my business, and assure you, will cheerfully recommend you to my acquaintance needing such services. Hope to have a case again before long, of my own. I have been an inventor all my life, but let others reap the benefit, or had work stolen from me. Please have the extra copies of my patent, etc., mailed to me direct, and oblige

Yours truly, J. H. WOODRUM.

Prompt Attention to Business.

AURORA, NEV., Dec. 7th, 1878.

MESSRS. DEWEY & Co., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

OUR $6.00 NEW-YEAR'S GIFT

A $6.00 NEW-YEAR'S GIFT OF COIN SILVER TABLEWARE GIVEN

AWAY!

Consisting of an Elegant Extra **Coin Silver** Plated Set of **Teaspoons** that retails at **$1.50** per set, and an Elegant Extra **Coin Silver** Plated **Butter-Knife** that retails at **$1.50.** Thus making both the Set of **Teaspoons** and **Butter-Knife** a valuable and useful **New-Year's Gift** that all should secure at once.

The old established and reliable **Eagle Gold and Silver Plating Co.**, Cincinnati, O., will supply this valuable Silver Tableware as a New-Year's Gift. This **elegant Set of**

SILVER TEASPOONS AND BUTTER-KNIFE

are of the latest style pattern, and **each article is to be engraved with your name or initial**, if desired, *free*, thus making the most useful and beautiful Gift ever presented. Don't neglect to send your initial or name with orders to be engraved.

Cut out the following premium order and send it to the EAGLE GOLD AND SILVER PLATING CO., at Cincinnati, for redemption, together with sufficient to pay boxing, packing, postage, or express charges. **This Silverware is to cost you nothing** except the packing, postage, or express charges (one dollar), which you are required to send, and the Silverware is then

DELIVERED TO YOU FREE.

Please cut out the following New-Year's Gift Premium Silverwares order and send same to EAGLE GOLD AND SILVER PLATING CO., 180 Elm Street, Cincinnati, O.

☞ **CUT OUT THIS ORDER, AS IT IS WORTH $6.00.** ☜

New-Year's Gift Silverware Premium Order.

On receipt of this Order and **$1.00,** to pay postage, packing or express charges, we will mail you FREE one Set of Extra Coin Silver Plated Teaspoons worth $4.50, also one Elegant Butter-Knife worth $1.50, with your monogram initial engraved upon same in good style—thus making the Elegant Set of $6.00

TEASPOONS AND BUTTER-KNIFE

a free New-Year's Gift to you. Send for Silverware at once, together with $1.00, stating name in full, with post-office, county, and State. Address all orders to

Eagle Gold & Silver Plating Co., 180 Elm St., Cincinnati, O.

Cut out the above order and send for the Gift at once, together with **One Dollar** to pay postal and packing charges, so that the articles can be delivered to you **free of any expense.** Address **Eagle Gold & Silver Plating Co., 180 Elm St., Cincinnati, O.**

OUR $6.00 NEW-YEAR'S GIFT

Iron and Machine Works.

THOS. PENDEROAST. HENRY S. SMITH.

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MANUFACTURERS OF

IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Oasometers, Girders, Bridgee and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

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MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

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MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Golden State & Miners Iron Works,

Manufacture Iron Castinge and Machinery of all Kinds at Greatly Reduced Rates.

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Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Brodie's Patent Rock Crusbere and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Brees, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

GEOROE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

UNION IRON WORKS.

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Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO.

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MACHINE WORKS,

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IMPROVED PORTABLE

Hoisting Engines,

For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery.

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MANUFACTURERS OF

RAILROAD AND MERCHANT IRON,

ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

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Hinckley, Spiers & Hayes.

(ESTABLISHED IN 1855.)

Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

Mining Machinery.

Hoisting Engines and Works, Cagee, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnacee for Reducing Oree Water Jackets, Etc.

Sugar Machinery.

Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanke.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the eame, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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First and Fremont Streets, between Mission and Howard, San Francisco, Cal.,

RANKIN, BRAYTON & CO.,

Manufacturers of

ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Bailey Air Compressor, Howell's Improved White Furnaces, Walker's Compound Steam Pumps, Etc.

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Manufacturer of Wrought Iron Girders, Trusses, Prison Cells, Iron Roofs, Crest Railings, Finials, Fences, Weathervanes, Gratings, Iron Work for Models, Etc.

Nickel Plated Railings. Bank and Store Fittings. Estimates given and Iron Work furnished for Buildings

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Builders of Steam Machinery

IN ALL ITS BRANCHES,

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HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

ORDINARY ENGINES compounded when advisable.

STEAM LAUNCHES, Barges and Steam Tugs constructed with reference to the Trade in which they are to be employed. Speed, tonnage and draft of water guaranteed.

STEAM BOILERS. Particular attention given to the quality of the material and workmanship, and none but first-class work produced.

SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therewith.

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HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.

SHIP WORK. Ship and Steam Capetaine, Steam Winches, Air and Circulating Pumps, made after the most approved plans.

PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposee, built with the celebrated Davy Valve Motion, superior to any other Pump.

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Inventors and others can get First-Class Work at Moderate Prices.

After 10 years experience with inventione and other mechanical work, I am fully prepared to execute drawings, working-models and fine machinery of any description to entire satisfaction.

Brass Finishing, Pattern Making, Gear Cutting, Telegraphic and other Electrical Apparatus by competent workmen.

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Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

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Double C. Reversible. 6½x12, 6x12, 7x12, 8x12, 9x14, 10x14

ALL SIZES Hoisting Engines FOR SALE BY BERRY & PLACE

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Market, head of Front Street, San Francisco.

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From ¼ to 10,000 lbs. weight, true to pattern, sound an eolid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Send for circular and price list to

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.

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San Francisco Cordage Company.

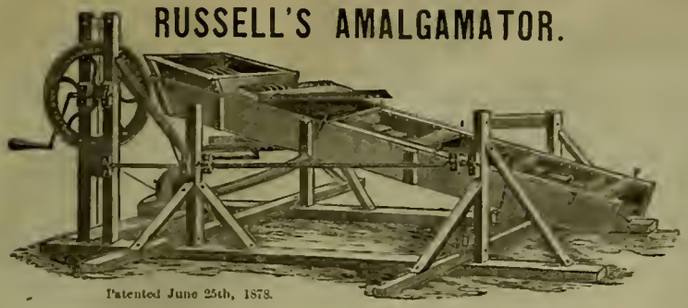
Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

611 and 613 Front Street, San Francisco

RUSSELL'S AMALGAMATOR.



Patented June 25th, 1878.

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And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

IS GUARANTEED TO SAVE THE FINEST OR FLOAT GOLD.

Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

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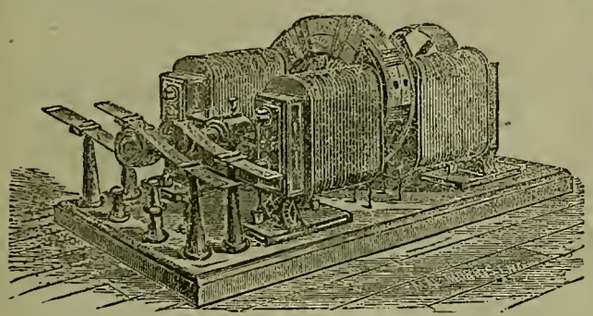
ELECTRIC LIGHT.

BRUSH PATENT.

The Best, Cheapest, Cleanest, and Most Powerful Light in the World.

In daily use at the Palace Hotel and the Union Iron Works, S. F.



For Lighting Mines, Factories, Mills, Streets, Theaters, Public Halls, Etc., It has no Equal, either for Brilliancy or Cheapness.

For further particulars, Catalogues, Prices, Etc., apply to

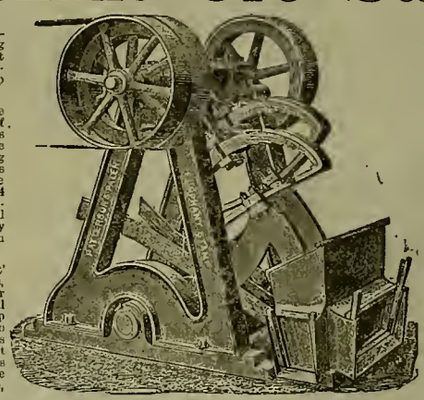
WILLIAM KERR,
President S. F. Telegraph Supply Co.,
903 Battery St., San Francisco.

Elephant Ore Stamp.

We beg to call your attention to this engraving representing the Elephant Ore Stamp. The advantages claimed for this Stamp are as follows:

Capabilities.—The "Elephant" is capable of crushing as much stuff as a 12-Stamp Battery of the present system, having crushed as high as 1½ tons of tough copper ore in one hour, through a No. 4 punched screen. The undersigned, however, will guarantee 20 tons per day of ordinary quartz through the same size screen.

Wear.—The 'Elephant' having only two pairs, Shoe and Dies, the wear in this instance is equal to one-sixth of a 12-Stamp Battery. There being no Cam Tappets, Cam Shafts or Guides, the consequent wear on these parts is done away with; the leather thoroughbrace, uniting the lever with the spring, would only require replacing at most, once a year.



Power.—The "Elephant" only requires a seven horse-power engine to drive it, where a 12-Stamp Battery would require from 18 to 20 horse-power.

Portability.—The entire Battery, including Mortar, will weigh about six tons, thereby causing an immense saving in the way of freight to such places as Arizona, Mexico, Carihoo and Bodie. As no part of the Machine weighs more than 1,800 pounds, the handling of the Machine is comparatively easy, and in places where it would be necessary to pack the Machine on mules, it could be easily made in pieces not to weigh over three hundred pounds.

The above engraving shows the Machine in exactly the position it would be placed in a mine; the reader will therefore see that all wood work is done away with, and that once the Machine is on the ground it will take but a few days to set it up and have it in full working order. The "Elephant" can be seen working every day from 2 to 4 P. M. at No. 342 Main street, near Harrison, San Francisco. For particulars apply to

EDMUND WHITE, Care of A. B. Grogan, 705 Sansome Street, San Francisco.

SANDERSON BROS. & CO.'S

Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

A full and complete stock of this reliable and well-known brand of Steel, for mining and other uses, now in stock and for sale

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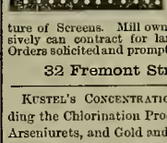

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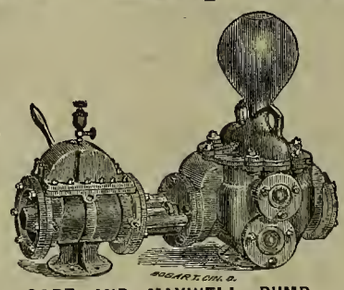

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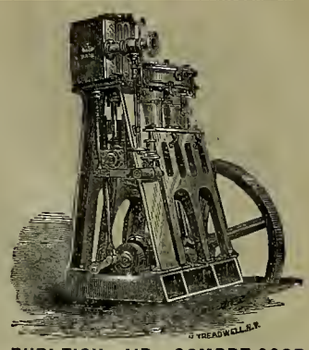

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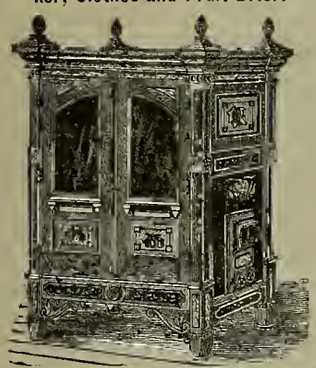

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Pocket Map of California and Nevada.

Compiled from the latest authentic sources, by Chas. Drayton Gibbs, C. E. This map comprises information obtained from the U. S. Coast and Land, Whitney's State Geological, and Railroad Surveys; and from the results of explorations made by R. S. Williamson, U. S. A., Henry Degroot, C. D. Gibbs and others. The scale is 18 miles to 1 inch. It gives the Judicial and U. S. Land Districts. It distinguishes the Townships and their subdivisions; the County Seats; The Military Posts; the Railroads built and proposed, and the limits of some of them; the occurrence of gold, silver, copper, quicksilver, tin, coal and oil. It has a section showing the heights of the principal mountains. The boundaries are clear and unmistakable, and the print good. 1878. Sold by DEWEY & CO. Price, postpaid, $2; to subscribers of this journal, until further notice, $1.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 11, 1879.

VOLUME XXXVIII Number 2.

Walled Lakes.

During the explorations this season of Prof. Hayden's parties in the Yellowstone National park, many mountain lakes were found to exist, besids Yellowstone lake, the largest and best known among them all. They are beautiful sheets of water, and surrounded as they are by the quiet grandeur of the mountain scenery, their loveliness is very impressive. When one has gratified himself with admiration of their picturesque beauty, and comes to give them more detailed examination, he discovers among their interesting features—the existence upon their shores of those peculiar embankments which have been called "walls." These are especially observable upon the shores of Heart lake, one of the tributaries of Snake river, and in one of Mr. Jackson's fine photographic views of that lake the wall is clearly shown.

The position of these embankments is upon the gently sloping shores, and at or near the high water level, which at the time of low water is often some rods from the margin. Similar embankments exist upon the shores of the numerous small lakes of northern Iowa and southern Minnesota, and in other northern States, and their origin was the subject of much vague speculation, until a few years ago, when it was clearly explained by Dr. C. A. White, in his report on the geology of Iowa, as follows:

"The water is usually lowest in late autumn, and when winter comes it is frozen to the bottom over a wide margin from the shore. The ice, of course, freezes fast to everything upon the bottom, whether boulders, sand, gravel or mud, and the expansive power of the water in the act of freezing is exerted upon them, acting from the center of the lake in all directions towards its circumference. Those who are familiar with the expansive power of ice in the act of forming, will readily see that under such circumstances it would be more than sufficient to move the largest boulder up the gentle slope of the bed of the lake. It is true that the motion resulting from one winter's freezing would be hardly perceptible, but the act repeated from year to year, and from century to century, would ultimately move everything upon the bottom beyond the reach of the ice. The tracks of boulders thus moved have been observed, being as unmistakable in their character as those which the river mussel leaves behind it in the sand.

"Thus it will be seen that whatever was originally upon the bottom of the lake, within the reach of the ice, whether boulders, sand, gravel or mud, has been constantly carried towards the shore, where we find them collected in perfectly natural disorder, and forming a ridge just where the expansive power of the ice ceased. Below the line of freezing, the same kind of material would of course remain unmoved upon the bottom, because there is nothing to disturb it.

"The embankments vary in hight from 2 to 10 feet, and from 5 to 20 or 30 feet across the top, their size and outline varying according to the materials which compose them. If boulders were numerous upon the bottom, the adjacent embankment is largely composed of them; if sand prevailed, a broad, gently rounded embankment resulted, just such as might be expected from that material; and if mud, filled with the fibrous roots of water plants and sedges were brought out by ice, a steep, narrow embankment was formed, because such material will stand more erect in a ridge or embankment than sand or boulders will.

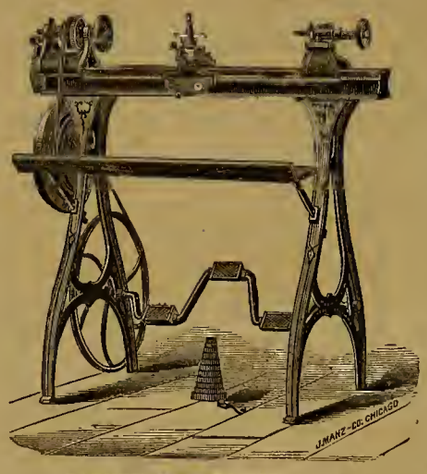
"This description was applied especially to the so-called walled lakes of northern Iowa and southern Minnesota, the embankments of which were formally believed by many to have been of artificial origin, but it applies equally well to the mountain lakes of the Yellowstone National park."

THE third-class ore from the White & Shiloh Con., Battle Mountain, Nevada, produces crude bullion that goes from $11,000 to $12,000 per ton. The first and second class ores are shipped.

Barnes' Foot-Power Lathe.

Messrs. Osborn & Alexander, of 628 Market street, in this city, dealers in hardware, lathes, scroll saws, etc., are also agents for Barnes' improved lathe, which is illustrated on this page. This No. 5 lathe is a strong and powerful engine lathe, having all the necessary appliances for rapid and accurate execution of heavy or light work. The size will best accomodate the requirements of those wishing a lathe for general work within the range of foot work, for manufacturing or repairing purposes. It is substantially built of iron, steel and brass, each used where they will best serve. Every part is in true proportion and all arranged for convenience, strength and durability.

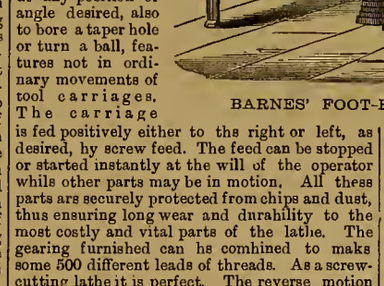
The tail stock can be instantly set at any desired point, or taken altogether from the lathe bed and without wrench or removing bolts. It can also be set over for turning tapers. The spindles of both head and tail stock are of cast steel with positively true taper holes for the reception of the centers. The center of the tail stock is self-discharging.



BARNES' FOOT-POWER LATHE.

The tool carriage is a model of convenience and accuracy. The tool can be set to the work at any position or angle desired, also to bore a taper hole or turn a ball, features not in ordinary movements of tool carriages. The carriage is fed positively either to the right or left, as desired, by screw feed. The feed can be stopped or started instantly at the will of the operator while other parts may be in motion. All these parts are securely protected from chips and dust, thus ensuring long wear and durability to the most costly and vital parts of the lathe. The gearing furnished can be combined to make some 500 different leads of threads. As a screw-cutting lathe it is perfect. The reverse motion used renders it practically impossible for the tool to change its cut when being returned.

The are *no cast gears* used in the gearing of this lathe. All the gear wheels are cut in the best machinery known for gear cutting, from solid metal and are positively true and as noiseless as it is possible for metal gear. This lathe weighs 225 lbs., and except the balance wheel of 30 lbs. the weight is all in its working parts, which is a great consideration when compared with the lathes arranged with the old faulty foot-power motions, the balance wheels of which often weigh 200 lbs., or more than all the balance of the lathe. This great weight is entirely useless except to overcome faults in a defective foot motion.



ELTERICH'S SCREW CUTTING TOOLS.

Angular belting is used on this as well as on other lathes, from the fact that it will drive stronger and never casts from the cones. This lathe with its back gearing and differential pulleys has a greator range of speeds than has ever been before offered in a foot-power lathe for the price. The seat hinges at one end, allowing the operator to pass between it and lathe to be seated. The price of the lathe is $115, a lower figure than for other lathes, and all necessary wrenches and belting with face plate and centers are furnished.

Machine-Shop Rambles.

Edwards' Western Iron Works.

We have lately visited the works of Perry Edwards, 316 and 318 Mission street, and learned much there that is of general interest. At these works a specialty is made of what may be termed the fine art of iron work. All have noticed and admired the artistic iron fencing that surrounds many of our most attractive residences. The crestings upon the roofs of our houses are none the less attractive, and display in many cases great ingenuity and taste in plan and execution.

There is another style of work which, if, not artistic, makes upon the mind a stronger impression than does that which is truly beautiful: we speak of the iron work about prisons; the ominous gratings, the heavy bolts and bars and doors. It is work of this class that is done at the Western Iron Works. Mr. Edwards has just finished an order for 250 feet of

Iron Fencing

For parties in Napa. Most of his work in this line is for orders out of the city. He has on hand now a job of 400 feet of fencing and cresting. He furnished the new Hall of Records with iron doors and shutters, and has lately finished a large iron

Hot-Air Drier

For the Magdalen Asylum. This drier is 16 feet long, 12 feet wide and 3 feet high. A fire is built under it. The air circulates through the drier, becoming heated and passing off up the chimney. The clothes are hung above the drier after washing.

Perhaps the most interesting department of his work is

Model-making.

In this line the most notable job that he has lately done is the making of the iron work for Russell's amalgamator. This machine has acquired some little notoriety as being the pattern used at the ocean placers, which a few months ago attracted so much attention.

In addition to the classes of work we have mentioned, Mr. Edwards advertises to do all kinds of house iron-work, including the manufacture of wrought-iron girders, trusses, nickle-plated railings, and bank and store fittings.

PACIFIC COAST POSTAL CHANGES.—The following are the changes for the week ending Jan. 4th: Offices Established—Little Stony, Colusa county, California; James R. Davis, Postmaster. Home, Baker county, Oregon; Wm. S. Glenn, Postmaster. Greaterville, Pima county, Arizona; Thos. Steele, Postmaster. Grouse Creek, Box Elder county, Utah; Mrs. S. H. Kimball, Postmistress. Postmasters Appointed—Hiram Lush, Jacob City, Tooele county, Utah; R. O. Shirley, Logan, Cache county, Utah.

THE Ruby Hill (Nevada) *Mining Report* urges the erection, by some well-disposed capitalist, of a $5,000 sampling works for the accommodation of that district.

Three More Railroads.

The signs of the times have shifted. Let us see what we see:

In Arizona it is evident that they are building the Southern Pacific railroad from the West End. It is well known also that both the Denver & Rio Grande and the Atchison, Topeka & Pacific Railroad Companies, which have been building energetically southwestward, have, both of them, vitality enough to reach the western boundary of New Mexico in due time. The connecting route is the present freight route from the East to Tucson. It will continue to be such only a very short time, for San Francisco will tap the Tucson trade and will have all of it, until the Eastern people reach out for it, just as we are doing, with an iron road.

The Northern Pacific people have let contracts for building a section that will bring them up speedily to the Rocky mountains from the east end. The great wheat plains of eastern Washington, which shipped the past year more than their million bushels of wheat, are well known to be rapidly extending their plowed acreage, but the country has no railroad. The Northern Pacific survey runs through those wheat fields for several hundred miles. Does anyone imagine that the Northern Pacific Railroad Company is so dead, at the present time, as not to be able to build that part of their road under such conditions? If so, he will probably live to learn that a portion of the grain crop for the present year, and all of it for the next in the upper Columbia country, will be moved by the Northern Pacific railroad. The route surveyed last season, between the Upper Columbia and the Wilkeson branch to the Mt. Rainier coal region, was found satisfactory; and that connection will be made as the next step, taking the statement of Superintendent Black as our evidence of the intentions of the company.

It is not generally known nor understood that the Canadian Pacific railway is in progress of construction at Winnipeg, and that the Canadian ministry have procured a large loan in England, the object of which is understood to be the building of the railway. Every foot of the line has been located by location survey on a most advantageous route, after surveying some 30,000 more miles on other lines, for making comparisons of routes and getting the best. The Canadian Premier, Sir John McDonald, represents the city of Victoria, and the policy of beginning construction immediately at the western end and carrying it on simultaneously with construction at the eastern end.

Screw Cutting Tools in Sets.

At Dunham & Carrigan's hardware store, in this city, they have a variety of improved screw cutting tools in sets, all packed in neat boxes ready for use. A representation of a set of Elterich's tools is shown on this page, showing a No. 3 set, in walnut box. No. 1 contains one die-holder, one tap wrench, and one tap and die each. Nos. 4, 6, 8, 10, 16 and 14, price in walnut case, $7. No. 3 (shown in the cut), contains a die-holder, tap wrench, and one tap and die each of Nos, 2, 3, 4, 5, 6, 8, 12 and 14, and two each of No. 10 taps and dies. Price in walnut case, $10.

These are furnished with standard machine-screw threads and plug taps. The dies cut rapidly, and furnish a perfect thread at one cut. They are made exact to size, but can be adjusted for wear. The taps are hand-made, ground out and relieved, so that they can be hacked out from the work without breaking. Every tap and die is warranted. The sets are put up in neat boxes, and are all good serviceable tools, well made and neat in appearance.

SPECIAL CORRESPONDENT, Capt. Wm. H. Seamans, of Oakland, left for Prescott, Arizona, on Tuesday of this week. He will visit some of the northern and other mining districts of the Territory on private business, and has promised to take notes and send some letters to the PRESS from such places as are not visited by our general agent and correspondent.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Search for Refractory Ores.

Editors Press:—Let us understand each other. What do we mean by "refractory ores?" I am aware that, by miners, the term is applied, as regards gold, to all such as cannot he satisfactorily treated by simple amalgamation in batteries and on plates; as regards silver, to such as cannot he worked raw in iron pans. Those ores which are made profitable by these simple means are denominated "free milling," even though, as at Virginia, there may be a considerable loss of precious metal. Among metallurgists, however, I opine that refractory ores are those which present considerable difficulty in their treatment hy any generally known process, for of secret processes no account can he taken. Refractory ores which defy the metallurgist then, are those which, though containing enough metal to pay the cost of the intelligent application of known methods of extraction, cannot be worked satisfactorily because of the failure of such methods to extract the metal.

A metallurgical success necessarily involves the element of profit; for metallurgy is a science applied to the wants of life, and an operation which is conducted at a loss, however satisfactory in a purely scientific point of view, cannot be called a metallurgical success in any practical sense.

On the other hand, however, the mere fact that a profit is made does not of itself justify the claim of a metallurgical success; for this, to my thinking, requires that the given ore shall he worked as closely as is possible by known means, consistently with the greatsst profit, which again does not always mean the largest immediate return; for since mines are not inexhaustible, practically, economy of ore is to be considered. Thus I have never been able to consider the work done on the Comstock as a metallurgical success, because I have had reason to think that hetter work might bave heen done, with greater profit to owners; and so with the gold quartz milling, though often profitable, it cannot be called metallurgically successful if 30% of the gold is lost as some say; unless, indeed, the resources of science are inadequate to the saving of a higher percentage, with equal or greater profit. I know of a large copper mine which is said to yield a profit, though only about half the copper is extracted. This is not a metallurgical success, because, by the use of a better process, almost all the copper can he got, with increased profit.

Poor ores which do not contain sufficient metal to pay the cost of manipulation, under the couditions of locality, etc., are not necessarily refractory.

To sum up, refractory ores are those which are difficult to work; and refractory ores which defy the metallurgist, are those which cannot be worked. Poor ores, whether refractory or not, must await the increase of facilities, and improvement of machines and processes.

Ores which can he worked by the O'Harra furnace are not refractory, for that furnace is nothing more nor less than a reverheratory furnace, with automatic stirring apparatus, and any ore which can be worked in it cau he worked in tbe old reverberatory; the difference is in the cost, so that the ore, previous to the introduction of the O'Harra furnace, was in the category of *poor ores*, from which that furnace has redeemed it.

With the Willard furnaco the case is somewhat different. It involves priuciples whicb, though not new, have not, I think, heretofore been so well applied. It presents two advantages: firstly, avoidance of dusting; secondly, a low temperature. Perhaps, I may add, a better olimination of arsenic and antimony, etc. Its performance will be watched with interest.

I have heard a great deal about the Meadow Lake ore, aud intend to inform myself further about it. In the meantime I will observe that there are two classes of men who are very liable to fail in treating ores. Ono is the theoretical, laboratory man, who knows nothing of practical work or husiness, and is led away hy scientific zeal. He may make a chemical success, but is apt to fail in the pecuniary point. The other is the self-styled, self-sufficient "practical man," who, having picked up, without having comprehended, the routine of operations in one place, finds himself, under new conditions, utterly helpless; unable to succeed in any sense and equally unable to give an intelligent reason for failure.

If the owners of ores which are thought to be refractory will come forward with a few facts, some among us may be enabled to assist them with mutual bensfit. In order to elicit this information I will take the liberty of asking these gentlemen a few questions:

1. What aro the valuable contents of your ore, kind aud quantity per ton?
2. What is the price of fuel, labor, lumber and freight from point of supply; or where ie the miue?
3. What methods bave been tried, and with what results?
4. What is the matter with your ore? Why is it refractory? What makes it so?

With the answers to these questions hefore us we can think intelligently about it, and if light appears to some one of us, a sample of the ore can he sent for and experimented on.

I will conclude with a proposition upon which I have heretofore enlarged in your columns. Any chemical operation which succeeds on a small scale, will gives the same result on a large scale, if all neccssary conditions are maiutained. It is only hy a rigid regard of this rule that metallurgical experiments on a small scale can he relied on. Any ore which can hs worked with profit on a small scale can he worked with more profit on a large scale, if the supply of material to work on, and to work with, is adequate. C. H. Aaron.

Defects in the Mining Laws.

Editors Press:—Having noticed an extract from your paper, pnhlished in the *Miner* here, I am induced to say something further. The article had relation to the U. S. mining laws of 1866 and 1872. I think we feel the injustice here, probahly more than any other State does, of these acts. They doubtless were framed by men who knew nothing ahout a mine, or what the miner needed to protect him from fraud and robbery. Your remarks are true, here, "that the miner himself enacted local laws which were far hetter suited to his requirements than any law yet passed by Congress or Legislature." The trouhle is we send politicians to represent us who know nothing of, and care less for, the interest of the miner.

This State perhaps is peculiarly situated, differing from any other mining State in its formation. Our veins or lodes (which we call lodes), will average probably one for every acre of surface in a mining camp, say 10 miles square. Of course niue-tenths of these are nothing hut feeders and spurs from the main vein. Hence, in nine cases out of 10, locations and discoveries are made on these spurs, and the main fissure vein is liable to be left undiscovered, as generally in this country the main vein is deeply huried in the drift or slide.

These locations (utterly worthless except as occupying the ground to prevent the prospector from coming anywhere in the neighborhood), he holds ou speculation to sell. It is for the public interest that the fullest latitude should be given to the prospector, for to him alone is the public indebted. There is one instance in this county where flow of the richest quartz, worth from $1,000 up to $10,000 per ton is found, but the lode has not yet heen found, and probahly will not for years to come, as all the ground is taken up by these worthless discoveries, which in many cases are held by patents. The prospector is warned off and is considered a trespasser; hence he seeks other fields for exploration.

Another objectionable feature we find in the law here. For instance, A makes a prior location of 1,500 feet in length by 150 feet in width, (as our local law is here). B makes a subsequent location and crosses A's claim at a point so as to take in A's discovery or location. B makes application for his patent for 1,500 feet long and 150 feet wide, and, hy the terms of the law, A must lose not only the strip across him 150 feet wide which B is claiming, but his whole claim 1,500 feet long, unless he adverses B at the land office, and show the facts in the case. What harm has A done that he must pay from $200 to $500 to prosecute this adverse suit?

I could continue to cite many more objections to this law of 1872. It is very true, I think as you intimate, that the men who made this law knew nothing of what they were legislating about. The member from Mississippi I guess was about right. We eend men from these mining States, not for what they kuow of our interests, but for the amouut of money they can command to purchase votee at the election, no other qualification is requisite.

This State's richness in mines is but beginning to be known, we have had to learn everything hy practical experience. If Congress can let us alone Colorado will soon prove to the world that she stands second to none of her mining sisters. Yours respectfully, S.

Georgetown, Colorado, Dec. 22d.

Cost of Artesian Wells.

Editors Press:—I see in a late number of the Press an article giving the cost of artesian wells. It seems too higb. The regular price in this county is as follows: Boring first 100 feet, $50; each additional 50 feet, 50 cents per foot more. Pipe, No. 14 sheet iron, joiuts two feet long and lapping half way, 85 cents each; No. 16 iron, 70 ceuts each; diametor, seven inches. A larger diameter would cost more, but not a great deal. The strata commonly met with are: Quicksand, blue clay, black clay, cement, gravel, boulders, etc., alternating; no hedrock.

The farmer or person on whose land the well is bored, boarde the hands that bore the well, and generally moves the tools from the last well to his place. Wells in this county are of all depths, from 70 feet to 400 feet, and flow from oue inch to seven inches over the top of the pipe, and sometimes more. Well Borer.

Westminster, Los Angeles Co., Dec. 24th.

Refractory Ores.

Editors Press:—I see pnblished in your columns an inquiry from C. H. A., asking where to find refractory ores. I have several lodes containing gold, silver and copper—no lead. The assays run from $10 to $600 in gold, from $14 to $400 in silver, aud from 10% to 60% in copper. The mines are situated at Caribon, Oneida county, Idaho, not far from Soda Springs. The hest route is by way of Corinne, Utah. If anyone who wishes to inspect the mines will come ahout the first of May, I will accompany him to ths mines. I have men at work there all winter. None of the mines are well developed. The most fully developed so far is the Oneida. They are down 80 feet on this mine. The assay is $720 to the ton, all gold. As yet no capital has taken hold.

There are good placer mines in the vicinity, about 15 miles from Snake river. The miners are all doing well. The formation is granite and porphyry. The gold is fine flour. The dirt seems to pay very evenly from top to hottom. There is plenty of wood and water.

Anyone can see samples of the different ores by calling on me at Corinne, Utah. The distance from this place to the mines is ahout 140 miles. Part of the way may he traveled hy rail. It is possible to go from here by teams in five days. Hiram House.

Corinne, Utah, Dec. 24th.

[Mr. Honse does not say whether the ore can be worked or not. It would he well for him to eend us some account of any attempts that have been made at working the ores; also more complete analyses of the same.—Editors Press.]

Snake River Again.

"Forty-niner," writing again to the Salt Lako *Tribune*, joins issue with "Snake Bite" on the gold-washing question.

I say again, place tbe boxes coutaining the plates, as flat as you can, and have the sand wash off, aud not clay the plates. I take issue directly with the Biter'e idea that the "finer the gold the steeper the plates should be set." It will not staud the test of practice or experience, and I have had over 20 years of both, in saving gold, from the old arastras up to the latest styles of batteries, plates and pans.

The slower the gold can be made to pass over the plates, the more will adhere to them. A single trial of five minutes in front of hatteries mining rich rock, will convince anyone of this, holding a plate at different degrees of pitch so that the pnlp passee over it.

If they are too steep, or too mucb water, when a swift current passes over them, much of the gold goes also. This is too well known to need argument with those who are posted. I now quote the crooked one: "1st. It is not neccssary in the new machine to fork out the coarse rock, as he states; it would cost too much." I did not state anything of the kind. I said it must he doue. If this labor can be avoided by placing perforated iron plates over the amalgamated platcs, and have everything carried over but fine sand and gold, I have no objection, only that it will he more expensive in the outfit, and some saud and gold will pass with the coarse material.

I now add to the directions given hefore: If there is tough clay or other material holding and mixed with the gold, which requires a good head of water and swift motion, spread the last sluice out like a pan or table, and divide the current of water with cleats and stops, so that the water and sand spread out evenly and wash slowly over the plates.

I will say for the process stated of amalgamating the plates that it has given good results for 25 or 30 years on the coast. I have used platee so amalgamated until they were worn out and replaced by new ones, the old ones being sold for $1 per pound, and melted for the gold they contained. On plates inside of the batteries, the amalgam will sometimes get very thick and hard, and adhere so firmly that it has to be chipped off with a chisel, and on the same plate perhaps (where violent splashing occurred) there would he spots where the amalgam was washed off through to the copper. But outside of the batteries where the plates can be seen, and a little quicksilver applied when such spots appear, no difficulty will occur in keeping them amalgamated.

As before stated, on the bowl of quicksilver used for this purpose, keep a solution of cyanide of potash. Some millmen assert that the weak eolution of acid is no henefit, others as stoutly insist that it is. I always found the quicksilver more effective in the pans when it was used. Try both and use your own judgment. This is anyhody's process, and has stood the test of long years of practice with practical amalgamators.

Our Solar System.—Exclusive of comets, there are now 224 members of our solar system known. There are now 190 asteroids known, unless others have been discovered since October 1st. In 1875 there were 17 discovered, the greatest number in one year. Prof. C. H. F. Peters, of the Litchfield observatory, Hamilton college, has discovered the greatest number, 31. Prof. Watson followe him in the list, having discovered 23.

Why the Sierra Nevada is Larger than the Coast Range.

A Legend of the Yokuts.

Stepheu Powers, in his "Indian Tribes of California," relates occasional legends of the strange peoples he visited. Many of these traditions are in themselves silly, child's fables, hut viewed from the standpoint of ethnology they possess peculiar interest. The tribe of tho Yokuts lived, or rather their remnants still live, ahout the northern half of Tulare lake, reaching as far north as the hend to the eastward of the San Joaquin, and extsnding to the east and west as far as the Sierras and the Coast Range respectively. The following legend belongs to this tribe. Powers entitled it the

Origin of the Mountains.

Once there was a time when there was nothing in the world hut water. About the place where Tulare lake is now there was a pole standing far up out of the water, and on this pole perched a hawk and a crow. First one of them would sit on the pole awhile, then the other would knock him off and sit on it himself. Thus they sat on top of the pole above the waters for many ages. At length they wearied of the lonesomeness and they created the birds which prey on fish, such as the kingfisher, eagle, pelican, and others. Among them was a very small duck, which dived down to the hottom of the water, picked its heak full of mud, came up, died, and lay floating on tho water. The hawk and the crow then fell to work and gathered from the duck's beak the earth which it had brought up, and commenced making the mountaius. They commenced at the place now known as Ta-hi-cha-pa pass, and the hawk made the east range, while the crow mado the west one. Little hy little, as they dropped iu the earth, these great mountains grew athwart the face of the waters, pushing north. It was a work of mauy years, hut finally they met together at Mount Shasta, and their lahors were ended. But, behold, when they compared their mountains, it was found that the crow'e was a great deal the larger. Then the hawk said to the crow: "How did this happen, you rascal? I warrant you have been etealing some of the earth from my hill, and that is why your mountains are the higgest." It was a fact, and the crow laughed in his claws. Then the hawk went and got some Indian tobacco and chewed it, and it made him exceedingly wise. So he took hold of the mountains and turned them round in a circle, putting his range in place of the crow's; and that is why the Sierra Nevada is larger than the Coast Range.

This legend is of value, says Powers, as showing the aboriginal notions of geography. In explaining the story, the Indiau drew in the sand a long ellipse, representing quite accurately, the shape of the two ranges; and he had never traveled away from King's river,

Further, it may he added, this legend and all of similar origin, are of valuo in correcting the ideas of "city folks" with regard to the California Indians. Those who have seen only the "Digger" in his debauched indolence, as he hange about some etage station, have no right to form an opinion, based upon tbeir own experience, of those unfortunate people. They do not deserve the approhrium attached to the term "Digger." They are interesting tribes, that have a history. They are falling hefore the advance of a people far better than themselves; hut not so much better, that the uncivilized cannot point to the civilized as the hasteners of the Indian's destruction. "We shall all die soon," wails the Yokuts Indian in his dance for the dead. "We were a great people once. We are weak and little now. Be sorrowful in your hearts. O, let sorrow melt your hearts. Let your tears flow fast. We are all one people. We are all friends. All our hearts are one heart."

Buying Gold at Boise.

Gold bullion is now purchased at the United States Assay office at Boise, Idaho, and paid for at its coining value in U. S legal tender notes at par, subject to the following deductions:

1. One-tenth of one per cent. for melting and assaying, with a minimum charge of ten cents for auy deposit of less value than $100.
2. When the character of the hullion is such as to require toughening, a charge for that operation will be made of from one half to two ccnts per ounce gross, according to the condition of the deposit, and on any such deposit of less weight than five onnces the charge will be imposed as if the weight was five ounces.
3. A deduction will he made from each purchass at the rate of $10 per $1,000, to pay for the cost of expressage to the mint at San Francisco.
4. When the bullion contains silver to the amount of 50 cents over and above the expense of parting it from the gold, a charge of eight cents per ounce gross will he deducted, and the balance of the silver paid for at the rate of 97 cents per standard ounce (900 fine), but if after deducting the partiug charge, less than 50 cents remain, no allowauce will he made for it to the depositor. When partable bullion coutains over 100 hase metal, an additional parting chargo of one cent per ounce gross will be imposed.

MECHANICAL PROGRESS.

Dry Graphite for Steam Cylinders.

Mr. W. J. Williams, a prominent engineer of Philadelphia, has called attention to the successful use of dry pulverized graphite for lubricating steam-cylinders. He applies 137 grains twice a day, introducing it into the cylinder through the usual form of tallow-cup. Six months of continuous use, in a horizontal engine, working to its full capacity, proves this lubricant superior in every way to oils or tallow, both of which he had used for years. No oil whatever is introduced with the graphite. Besides satisfying all the lubricating needs of the cylinder, the joints, where gum is used, last longer and show less of leakage.

After a run of four months, Mr. W. says: "I took off the cylinder-head of my engine to examine the interior. I found the piston perfectly clean, with no appearance of wear or abrasion, on account of plumbago being used as the lubricator. I feel very positive that if I had been using animal or vegetable oils, the parts would be in a much worse condition today. The cylinder has been scored for several years. It is in no better or worse condition now than it was before I quit using oils (about 14 months.) The working part of the cylinder is everywhere covered with a coat of plumbago, readily soiling the fingers.

"I touched the cylinder in the same place three times, cleaning the fingers previous to each touch, but they were soiled each time.

"The conclusion I have come to about the choking up of passages is, that plumbago alone will not do it; but wherever there is friction of one or more moving parts, some of it will adhere to them.

"I have never heard a noise in the cylinder since I have been using plumbago, except when the steam is entirely shut off at the stop-valve for the purpose of stopping the engine; and then it would be heard during one or two strokes of the piston before the engine would stop, and this not oftener than usually occurs when using any kind of lubricator.

"I increase the quantity of plumbago sometimes to 180 grains twice a day; 134 is the minimum and usual quantity."

Locomotives Without Fire.

Machines on the above-named principle are now at work on the tramway from Rueil to Marly, near Paris, and with satisfactory results. The system in use is one introduced by M. Francy, an engineer, and is based on the fact that water boils at a lower temperature proportionately to the reduction of the atmospheric pressure. It is well known that water requires a temperature of 212° Fahr. to boil at the sea level; but at a higher altitude, or where the atmospheric pressure is reduced artificially, as in a partial vacuum, it boils and produces steam at a much lower temperature.

Acting upon this principle, M. Francy takes a reservoir of thin steel, we cannot call it a boiler, for it has neither fireplace nor fire, and introduces water at a temperature of 200° Fahr., and then covers up hermetically. The steam it gives off at once fills the superincumbent space, and produces a pressure of 15 atmospheres. As soon as any of the vapor is turned on for moving the machine the pressure is reduced, and the water then begins to boil, producing a fresh supply of steam. Of course that process is but of limited extent, as, at the commencement, the liquid only contained a certain amount of heat, which is gradually diminished as the reproduction of steam takes place at lower temperature by the exhaustion of the superincumbent pressure. So far a machine of this description would be obviously totally inadequate to any prolonged journey. But for short transits it has been found extremely serviceable. As the amount of pressure required to work the engine is only five atmospheres, a series of valves are so arranged as to prevent a greater amount of force issuing from the reservoir than is necessary, and thus retaining as far as possible the heat originally contained in the water. The driving part of the machinery is nearly identical with that of ordinary locomotives, with a few modifications, with the purpose of guarding against the useless waste of the heat originally introduced into the reservoir.—*Galignani's Messenger.*

A MAGIC CAR.—Mr. Blackburn, of 14 Victoria Road, Kensington, has invented a remarkable vehicle, which requires no horse to draw it. The body is in the form of a dog-cart, and the arrangement of wheels like a tricycle. The motive power, concealed in the body of the vehicle, is obtained by the combustion of benzoline, a small jet of which is admitted into a burner about the size of an ordinary chimney-pot hat. The steam passes into the cylinders of a small torpedo engine, which rotates a horizontal shaft. There is no steam given off, for it is recondensed and passes back into the tubular boiler. The weight of the steam power is about 180 lbs. On lighting the benzoline the steam requires no attention from the driver during a ride of many hours. The driver, by applying his foot to a pedal, can regulate the speed and power of draft. It travels at the rate of about eight miles an hour, and is easily directed in its course.

The Age of Steel.

By the various cheapening processes which have of late years been introduced into the manufacture of steel, that article is fast supplanting the use of iron in the various industries, and notably so for railroad purposes. Bessemer steel rails are now produced nearly as cheap as iron. It now appears to be only a matter of time, and short at that, when Bessemer and Seimens-Martin steel will be so cheap that they will take the place of wrought-iron for almost every purpose. The latest new proposed use of steel is for tin plate makers, who, it is said, are about to abandon iron for that purpose.

The Bessemer steel trade, which had its origin in England rather more than 20 years ago, still continues to be followed more largely in that country than any other. Of about 2,000,0000 tons of Bessemer steel now annually produced throughout the world, England furnishes 750,000 tons; the United States, 525,000 tons; France, 261,874 tons; and Germany, 242,-251 tons. No industry in modern times has sprung up so suddenly into importance, nor has any other caused greater changes in the way of setting aside an old and introducing a new order. To this industry in supplanting the use of iron is due the fact that thousands of furnaces have been closed up and tens of thousands of workingmen either thrown idle or transferred to other occupations. The age of iron has become the age of steel. A new departure, long threatened and greatly feared, has been actually accomplished.

Composition of Bronze for Machinery.

Much industry and research has of late been bestowed in determining what mixture of bronzes is best suited for the various portions of machinery, and to meet the requirements of each special case and purpose. We give the following as the composition of alloys approved of and used by prominent French mechanics:

	Copper.	Tin.	Zinc.
FRENCH MARINE.			
Tough bronze for rods, valves, cocks, etc.	88	12	2
Very tough bronze for eccentric straps, etc.	90	10	2
Bronze for plummer blocks	86	14	2
Hard bronze	84	16	2
Very hard bronze for shcave brass cocks	82	18	2
Bell bronze	78	22	0
Anti-friction bronze (with eight parts antimony)	4	96	0
FRENCH RAILROADS.			
Car pillows	82	18	2
Locomotive and tender oil boxes	84	16	2
" slide valves	82	18	2
Cocks	88	12	2

The bronze composed of 86 copper, 14 tin and 2 zinc is least porous, and therefore is most suitable when pressure is to be resisted.

THE IRON AND STEEL PRODUCT OF THE WORLD.—A French statistician has furnished an estimate of the world's iron product, which shows that in 1876 the whole amount footed up at 15,785,730 tons of 2,000 pounds. The coal mined is about 20 times the weight of pig iron produced. The ratio of production in the leading iron-producing countries is nearly as follows: Great Britain, 46½; United States, 17; Germany, 5½; France, 10 1-5; Belgium, 3 2-5; Russia, 3; Austro-Hungary, 2 4-5; Sweden, 2½. The iron product of the United States for 1876 was 2,690,556 tons, or about 125 pounds for every inhabitant. The estimate gives the total product of all countries of Bessemer steel for 1876 at 2,323,436 tons, of which one-fourth was made in the United States, a little over one-third in Great Britain, not quite one-fifth in Germany, and one-tenth in France. The total steel made in 1876 would lay 22,116 miles of railway track, allowing 20 pounds to the foot of rail. The present rate of production would put steel rails upon all the railways in the world in less than 10 years.

PRESERVATION OF TIMBER FOR MINING AND RAILROAD PURPOSES.—It is remarkable that so little has been done in this country with the view of preserving timber, particularly for use in mines and for railroad purposes. The matter is certainly one of great importance, and has an important bearing upon the expenditure of enormous sums of money every year, both in railroad construction and repairing and in mines. A very elaborate series of experiments upon the effect of various preservatives has recently been made in France, the result of which we hope soon to give. These experiments have been made with particular reference to preserving timber to resist the heat and dampness of deep mines.

A NEW composition of iron and steel is described in the *Revue Industrielle*. A cast-iron mold is divided into two sections by means of a transverse plate of thin sheet iron. The two metals are then poured into the respective compartments. The sheet-iron partition prevents the mixture of the metals and facilitates the welding by itself being brought into a state of fusion. It is said that the product is well adapted for safes, and that it resists drills.

WEAVING slag wool is spoken of by an English paper as a thing accomplished in that country by Messrs. Jones, Dale & Co. Strips and sheets are made of it which, it is claimed, do very well for wrapping steam pipes.

EIGHTY-TWO hundred feet of track were laid on the Southern Pacific railroad in Arizona, January 3d.

SCIENTIFIC PROGRESS.

The Alleged Dissociation of the Elements.

We made some reference, in our issue of December 28th, to the reported discovery by Prof. Lockyer that at least some of the bodies known as elements are in reality compound bodies. The announcement was made by the Professor in the following words: "Reasoning from analogies furnished by the behaviors of known compounds, I have discovered, that, independently of calcium, many other bodies, hitherto considered elements, are also compound bodies."

In alluding to this alleged discovery, a London paper, *Iron*, evidently well informed in regard to the character of Mr. Lockyer's investigations, and the general subject matter, says that it is perfectly easy to form a plausible *spectroscopic theory* to the effect that complex spectra are really built up of simpler spectra, and that *therefore* the elements giving complex spectra are probably built up of the elements giving the simpler ones. Moreover, the atomic weights can be so treated as to corroborate this view. Considerations of this kind might easily give rise to the idea of the dissociation of the elements; of the transmutation of one into another, especially within certain groups of related elements. Such, for instance, as calcium, strontium and barium; lithium, sodium and potassium; sulphur, selenium and tellurium, etc. So much interest has been manifested in regard to Prof. Lockyer's announcement, that we have ventured to devote a large space in this department to a brief review of past speculations in this direction by scientists of acknowledged eminence.

It is well known that Faraday, nearly 30 years ago, intimated the probability of such a discovery—even without the hints in that direction lately given out by the spectroscope, an instrument which that noted chemist never lived to see. Possibly that scientist is thought by many to have adopted the theory far more fully than he really did; but fortunately we have quite a full record of what his speculations and investigations in this direction really were, in the *Chemical Record* of July 12th, 1851, in an interesting paper read before the meeting of the British Association of that year by Mr. Dumas. That gentleman was introduced and endorsed by Prof. Faraday, who, in his introduction, in alluding to the reported discovery of a new metal, remarked that he was almost sorry to welcome any more new metals, as his *hopes* were in the direction of proving that bodies called simple were really compound. The remarks which were to follow, by M. Dumas, the Professor said, were on certain curious relations between volume and simple weight, which rendered it probable that certain bodies, called atomic, were really compounds.

M. Dumas commenced by remarking upon the difference in solubility in water of lime, baryta and magnesia. Each was sparingly soluble, but magnesia the least so; while in the form of sulphates, magnesia was the most soluble. Why this difference? The same facts were true in regard to the two chlorides of mercury.

Again, chemical agency is the result of force, which force was at once indicated and measured by combining or atomic numbers; which were in inverse ratio to their power of chemical agency. Thus the atomic or combining numbers of chlorine, bromine and iodine, were respectively 35, 80, 125. Of this triad, chlorine would displace bromine; bromine would displace iodine. The three bodies, too, displayed other symmetrical gradations. Thus chlorine was most volatile, and iodine least; bromine being intermediate; and, as a consequence of the last deduction, chlorine was least dense, iodine most, and bromine intermediate.

Thus we have a triad or series of three bodies, displaying under three several aspects a symmetrical gradation. As chemistry becomes better developed it subjects itself to the scrutiny of mathematical investigation. Can mathematical investigation be applied to the triad of chlorine, bromine and iodine? And, when applied, does it give a result accordant with incipient speculation? The atomic numbers of chlorine, bromine and iodine, evidently supply us with the fairest data on which to exercise our calculations. Now, if there be any truth in these speculations, the atomic or combining numbers of the three bodies in the triad being taken, half the sum of the extremes should be equal to the mean; or half of 35, the atomic number for chlorine, plus half of 125, the atomic number for iodine should equal 80, the atomic number for bromine. And this indeed is the result, as will be evident on reference to the following simple arithmetical sum:

Atomic weight of chlorine	35
Atomic weight of iodine	125
Sum	160

Half of 160=80, the atomic weight of bromine.

"Thus it follows," to use the beautiful expression of M. Dumas, "if we could by any means cause the union of half an atom of chlorine with half an atom of iodine, we might hope to get, to form, to create an atom of bromine!"

Leaving the triad of chlorine, bromine and iodine, M. Dumas next took up a second triad, of sulphur, seleuium and tellurium; bodies which all chemists know to be isomeric—or capable of replacing each other in compounds, and to be endowed with properties mutually analagous. Of the three, sulphur is the most volatile, selenium next, tellurium least of all. As to their decomposing power, sulphur replaces selenium; selenium, tellurium; in short, the remarks already applied to the triad of chlorine, bromine and iodine will apply here.

Do the generalizations of M. Dumas apply? We will see.

The atomic or combining weight of sulphur is 16; of tellurium, 64; the half of the sum of these extremes is the number, 40—and this is the exact atomic weight of the middle term of the triad—the atomic weight of selenium!

Take, again, the triad calcium, strontium and barium. Without stopping to indicate the various analogies of these bodies, it will suffice to point out their general chemical similarity. In this scale of analogous qualities, calcium and barium are the extremes, strontium is the mean. The atomic weights of the three are as follows: Calcium, 20; strontium, 44; barium, 68.

It will be evident at a glance that there is here also a harmony between the chemical qualities and mathematical expouent of their combining proportion as before; for 68 plus 20 divided by 2 is equal to 44, the atomic number of strontium. Thus, to again use the expression of M. Dumas, if by any means we could effect the union of half an atom of barium with half an atom of calcium, we should have as a resultant one atom of strontium!

Let us take another triad: Lithium, 7; Sodium, 23; Potassium, 39. The similarities between the properties of these bodies is too evident to be pointed out; of the three, lithium is the least individualized alkaline metal; potassium the most individualized; sodium, as all know, stands intermediately between the three; and here again, as the most casual examination will demonstrate, the same purity of chemical and mathematical symmetry holds good.

Now, so extraordinary a symmetry of chemical qualities with mathematical exponents can scarcely be assumed to be a matter of chance; still less can it be said that the atomic figures on which these deductions are based have been strained to suit the opinions of M. Dumas.

M. Dumas followed his line of investigation from inorganic triads into those of organic radicals, as follows:

Hitherto we have been confined to inorganic triads. We will now look further still into the recesses of chemical philosophy. It will be familiar to most of our readers that many chemists have regarded certain bodies of compound nature as analogous in many properties to the metals. Of this kind are the three organic radicals: $C_2 H_3 O$; $C_4 H_5 O$; $C_6 H_7 O$; which may be regarded as three several oxides of an isomeric triad, bearing analogy to those already adverted to in the inorganic world. Now, the slightest examination here will prove again that the law hitherto applied holds good in this case. Omitting the oxygen in the three preceding substances, half the sum of the extremes will be equal to the mean.

From the above M. Dumas suggests as a general law: "When three bodies having qualities precisely similar, though not identical, are arranged in succession of their chemical powers, there will be also a successive arrangement of mathematical powers, indicated by the respective atomic numbers of the substances, and amenable to every mathematical law."

In regard to these illustrations and facts, Mr. Dumas further remarked: "That this symmetry of chemical with mathematical function points to the possibility of transmutation is unquestionable—yet not transmutation in the sense of the old alchemical philosophy. Chemists see no manifestations of a tendency of being able to convert lead into silver, or silver into gold. These metals are not chemically conformable. One cannot take place of another by substitution. They do not form an isomeric group. The probability is that our first successful transmutation as regards the metals will effect the change of physical state merely, without touching chemical composition; thus already we have carbon, which, as the diamond and as charcoal, manifests two widely different states. Sulphur also assumes two forms, as also does phosphorus. Then, why not a metal?" This sort of effect Mr. Dumas suggests will be among our first triumphs in the way of dissociation or transmutation.

We may here remark that in a lecture delivered soon after before the Royal Institution, Prof. Faraday, after similarly describing these curious arithmetical relationship, said: "We seem here to have the dawning of a new light, indicative of the mutual convertability of *certain groups* of elements, although under conditions which as yet are hidden from our scrutiny."

DISCOVERY OF A NEW MINERAL.—In examining a specimen of ore from the Silver Islet mine, on the north shore of Lake Superior, recently, Prof. Henry Wurtz discovered that it was a mineral unknown to the scientific world. He analyzed it and found it contained large proportions of silver and arsenic mixed with iron, zinc, cobalt and sulphur. He exhibited specimens of the new mineral, at a recent meeting of the New York Academy of Sciences, and gave to it the name of *Huntilite*, in honor of Dr. T. Sterry Hunt, of Montreal.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 19.		Week Ending Dec. 26.		Week Ending Jan. 2.		Week Ending Jan. 9.	
Alpha	9½	8¾	13¼	9¾	11	10¼	11¾	10⅛
Alta	6	5½	5⅝	5¼	5½	5	5⅝	5
Andes	60c	50c	50c	40c	50c	....	65c	50c
Alps	20c	....	....	....	....	....	....	....
Argenta	3	2⅞	3½	2.70	2.90	2.60	2.65	2.60
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	50c	40c	....	....	....	....	....	....
Baltimore Con	1½	....	....	....	....	....	1.40	1¼
Belcher	4.10	3.60	3.90	3½	3.80	3½	4.30	3.80
Belmont	45c	30c	30c	10c	60c	10c	60c	....
Best & Belcher	18¾	17	18	17½	18¾	17	18¾	17⅝
Bullion	5	4½	5½	4½	5⅝	4.65	7	5⅝
Bechtel	80c	50c	70c	50c	70c	50c	60c	50c
Belle Isle	30c	20c	20c	....	20c	15c	70c	....
Bodie	13½	9	12	7¾	8	7¼	9	7¾
Benton	4.10	3	3.60	3	3½	2¼	3½	3
Bulwer	16	15½	16	14	15	14½	15	10
Boyle	....	....	....	....	....	....	....	....
Black Hawk	50c	....	40c	....	....	....	30c	10c
Belvidere	75c	30c	50c	30c	75c	50c	60c	....
Booker	80c	50c	50c	30c	60c	50c	50c	45c
Caledonia	2.80	2	2½	2.30	2.55	2¼	2.95	2.40
California	10½	9¼	10	9½	10½	9⅝	11½	10⅝
Challenge	1.65	1.40	1.85	1½	1.70	1.60	2	1½
Chollar-Potosi	39½	33	39½	38	47½	38½	46	41½
Comanche	....	....	....	....	....	....	....	....
Confidence	9	7¾	9½	8¾	9¼	9	10⅜	9
Con Imperial	70c	65c	95c	70c	80c	70c	85c	75c
Con Virginia	8	4	8⅛	7⅜	8⅜	7¾	9⅞	8½
Crown Point	4.40	3¼	3.80	3.60	3.65	3.45	3.90	3.60
Con Washoe	3½	2.10	....	....	....	....	3.10	2.10
Champion	25c	15c	15c	10c	40c	30c	....	....
Concordia	50c	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	15c	15c	....	10c	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	30c	25c	25c	....	30c	....	25c	....
Eureka Con	36	34	33½	32	32	31	32½	31
Exchequer	3.90	3½	4.40	3.60	4.40	4	5½	4¼
Endowment	20c	10c	40c	10c	35c	30c	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	8⅝	7¼	9½	7¾	8⅜	7⅜	7½	5⅝
Gila	....	....	....	....	....	....	25c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	6	....	6	5½	5¾	....	5⅞	....
Goodshaw	50c	40c	40c	30c	40c	30c	40c	30c
Gould & Curry	8⅝	6⅞	9¼	8½	9⅜	8⅝	11⅜	9¼
Hale & Norcross	11¼	9⅝	11¾	10	12⅜	10⅝	14⅞	12¼
Hillside	2.60	2¼	2¼	2	2¼	2	2.10	2
Highbridge	2.30	2⅛	2.35	2¼	2.40	2¼	2.45	2⅛
Homestake	....	....	....	....	....	....	....	....
Hussey	30c	....	35c	30c	35c	....	30c	15c
Independence	1.45	1.30	1.30	1¼	1¼	1.20	1.10	1.05
Julia	3.80	2.90	3	2.90	5⅜	2¾	4.15	3½
Justice	4½	3.90	4	3½	3¾	3½	4¼	3.90
Jackson	9½	7	9½	8½	7¼	7	9	7¾
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4¼	3¾	4¼	3.70	3.90	3.70	4.85	3.95
Kossuth	20c	15c	20c	15c	20c	15c	50c	20c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.95	1.05	1.05	75c	90c	50c	75c	50c
Lady Wash	1.10	90c	1	90c	80c	70c	1¼	65c
Leopard	1¼	1	1	....	1	....	50c	....
Leviathan	40c	30c	40c	30c	50c	35c	65c	50c
Leeds	1.20	1	1½	1.15	1½	1¼	1	....
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	50c	....	50c	....	....	....
Modoc	....	....	....	....	60c	....	60c	50c
Manhattan	4½	4	4.15	4	4¼	4	4½	4
Martin White	4½	3	6	4½	5	....	4½	4
McClinton	60c	50c	50c	40c	40c	....	40c	25c
Meadow Valley	35c	30c	....	....	20c	....	20c	....
Mexican	29½	27	31½	27¼	31	28	33	30½
Mides	....	....	....	....	....	....	....	....
Morning Star	2½	....	....	....	2½	....	....	....
North Con Virginia	7½	4	5¾	4	5½	4½	6⅞	5½
New York	70c	60c	85c	60c	65c	55c	90c	75c
Northern Belle	10	9½	10	9¾	10	9¾	9¾	8½
New Coso	30c	25c	25c	20c	....	....	....	....
Navajo	50c	45c	50c	40c	45c	40c	45c	35c
Occidental	1	....	....	....	....	....	....	....
Ophir	42	36½	38¾	37	36	33¾	35¾	33
Oriental	30c	15c	75c	60c	65c	....	1¼	80c
Overman	10½	9	10½	9¾	9¾	9½	10	9⅜
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	30c	40c	30c	30c	25c	40c	25c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	10½	8	9¾	6½	8⅜	7½	6½	5
Richer	30c	25c	75c	60c	50c	40c	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	10	9	9⅞	6¾	10½	9⅜	13⅜	10⅞
Seg Belcher	20	....	20	18	18	17	20	....
Sierra Nevada	51½	46	48	44½	43½	37½	43	41
Silver Hill	1½	1⅜	1.65	1¼	1¾	1.30	2¼	1.40
Silver King	....	....	....	....	10	....	....	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	65c	50c	40c	25c	25c	20c	30c	20c
Summit	1¼	1.05	1.15	1	1.30	60c	1½	1¼
Scorpion	1¼	90c	1.15	1	1	50c	....	....
Solid Silver	50c	....	50c	....	50c	....	50c	....
South Bodie	45c	40c	....	....	....	....	25c	....
South Standard	30c	25c	30c	25c	25c	....	....	....
Star	50c	....	50c	25c	50c	....	50c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	2	1¾	1½	....	....	....
Tioga Con	1.60	1¼	1¼	1	1¼	1	1.20	1
Tiptop	1½	1¼	1½	1.35	1.40	1¼	1.30	1¼
Trojan	30c	25c	30c	25c	30c	25c	60c	30c
Union Con	61	54½	59¾	55½	58	52	58½	56
Utah	15	12¾	13½	12½	11¾	10⅞	13¾	11¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	75c	55c	60c	50c	1¼	50c	75c	70c
Wells-Fargo	25c	20c	20c	10c	20c	15c	20c	15c
Woodville	25c	20c	25c	....	25c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16	13½	15	14	14⅝	13¼	16½	13⅝

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 3.

50 Alta....5@5¼
150 Andes....60@55c
55 Alpha....10⅜@10⅝
10 Best & Belcher....17¼
1320 Bullion....6@5⅝
160 Belcher....3.60
1230 Benton....3@2.85
600 Baltimore Con....1¼
885 Con Virginia....8½@8¾
900 California....10⅝@11
85 Chollar....42@41½
475 Crown Point...3.65@3.60
310 Con Imperial....75c
510 Caledonia....2.40@2.45
45 Confidence....9
10 Challenge....1½
260 Exchequer....4½@4.30
740 Gould & Curry....9½@9¾
330 Hale & Nor....12¼@12½
575 Justice....3.90@4
2435 Julia....4.15@4
40 Kentuck....4.85
600 Kossuth....25c
100 Lady Wash....65c
375 Lady Bryan....60@65c
260 Leviathan....50c
170 Mexican....32¾@33
70 North Con Vir....5⅝
145 N Bonanza....55@65c
1620 New York....65@75c
25 Overman....9½@9¼
265 Ophir....35@35¼
265 Phil Sheridan....25@30c
165 Sierra Nevada....42½@43
275 Savage....11@10¾
705 Silver Hill....2@2¼
75 Solid Silver....50c
650 Trojan....30@35c
285 Union Con....58@58¼
75 Utah....11½
200 Wells-Fargo....20c
950 Ward....75@70c
200 Yellow Jacket....14

AFTERNOON SESSION.

340 Argenta....2.70@2⅝
50 Albion....2
250 Bechtel....60c
215 Bodie....7¾@8
45 Belmont....60c
670 Bulwer....14
360 Booker....50c
90 Black Hawk....30c
80 C Pacific....1½
100 Caledonia (B H)....1
100 Day....25c
35 Eureka Con....32
900 Endowment....30@35c
500 Goodshaw....40c
640 Grand Prize....7¼@7⅜
715 Hussey....30c
200 Hillside....2.10
600 Highbridge....2¼@2.20
500 Independence....1.10
210 Jackson....8@7¾
10 Leopard....60c
95 Manhattan....4¼@4.35
100 McClinton....25c
230 Mono....2.90@2.80
880 Martin White....4½
50 Meadow Valley....20c
100 Navajo....45c
20 Northern Belle....9⅞
310 Paradise....1.90@2
350 Real Del Monte....2
520 Raymond & Ely....8@7⅝
515 Summit....1½@1.45
50 Star....50c
200 Tiptop....1.30@1¼
20 Tioga Con....1.20

Saturday A. M., Jan. 4.

130 Alpha....10¾@10½
260 Alta....5½@5⅝
90 Andes....60c
50 Albion....1½
600 Argenta....2.65@2.60
550 Best & Belcher..18¼@18½
1315 Bullion....6⅞@6¼
400 Belcher....3.85@3.80
15 Bodie....8⅞@8¼
900 Baltimore Con...1.40@1¼
125 Benton....3@3.10
165 Bulwer....14¼@15
150 Black Hawk....10c
1299 Con Virginia....9¼@9
665 California....11⅛@11½
105 Confidence....9
80 Chollar....45@44½
235 Crown Point...3.60@3.55
800 Con Imperial....75@80c
330 Challenge....1.65@1.70
1085 Caledonia....2¼@2.40
50 Con Pacific....1½
100 Dudley....1
260 Exchequer....4.30@4.40
20 Eureka Con....32¼
670 Gould & Curry....10@10¼
1025 Grand Prize....7⅛@7¼
235 Gila....20c
80 Golden Terra....5⅝
610 H & Norcross....13¼@13⅝
40 Hussey....30c
1140 Highbridge....2¼@2.35
110 Hillside....2
80 Independence....1.10
690 Justice....4¼@4.20
1380 Julia....4@4.05
125 Jackson....8½@9
5 Kentuck....3.95
500 Kossuth....50c
390 L Bryan....55@50c
900 Leviathan....55@50c
100 Lady Wash....80c
120 Leopard....50c
300 Mexican....32¼@32
220 M White....4@4¼
160 Mono....2.80@2.90
250 Modoc....56@60c
100 McClinton....25c
1030 New York....75@85c
80 N Con Vir....5⅜@5¼
420 N Bonanza....50@55c
50 Northern Belle....9⅝
80 Ophir....35⅝
305 Overman....9⅝
2200 Oriental....80c@1
110 Phil Sheridan....30@40c
1075 Savage....12@12⅜
50 Succor....20c
160 Sierra Nevada....42@41½
1490 Silver Hill....1.80@1.40
50 Solid Silver....50c
150 St Louis....50c
200 Star....50c
635 Summit....1½
100 S Bodie....25c
125 Tioga Con....1.10
1400 Trojan....40@35c
150 Union Con....57@57¼
90 Utah....11¼
675 Ward....75@70c
800 Wells-Fargo....15@20c
745 Yellow Jacket...14¼@13⅞

Monday A. M., Jan. 6.

435 Alta....5½
50 Andes....65c
470 Alpha....10⅞@11
310 Best & Belcher...18¼@18½
1200 Baltimore Con....1.40
1140 Belcher....4¼@4¼
2260 Bullion....7@6¾
870 Benton....3@3.05
630 California....11¼
1350 Con Virginia....9½@9⅝
1570 Crown Point....3⅞@3.90
170 Con Imperial....80@75c
1800 Con Washoe....3.10
275 Chollar....46@44
215 Challenge....1.65@1.70
120 Caledonia....2.80@2.90
300 Dardanelles....1.15
1600 Exchequer....5@4.80
775 Gould & Curry...10½@10⅝
735 Hale & Nor....14¼@14¾
295 Justice....4¼
170 Julia....4½@4.05
150 Kossuth....20c
50 Kentuck....3.90
400 Lady Bryan....55c
1500 Leviathan....55@60c
135 Lady Wash....90c
345 Mexican....31½@32
165 North Con Vir....5¾@5½
765 N Bonanza....90c@1
250 New York....80c
100 Occidental....1
115 Ophir....35¼@34¾
460 Overman....9⅞@9⅝
100 Phil Sheridan....40c
60 Solid Silver....50c
115 Savage....13¾@13¼
125 Sierra Nevada....41¾@41½
905 Silver Hill....1.85@1.90
1330 Trojan....55@50c
160 Utah....11½
210 Union Con....57¼
450 Wells Fargo....20@15c
145 Ward....75c
35 Yellow Jacket....14½

AFTERNOON SESSION.

100 Aurora T....40c
205 Argenta....2.45@2¼
1050 Bodie....8½@9
15 Bulwer....15
200 Bechtel....60c
200 Belle Isle....20c
300 Black Hawk....20@15c
50 Booker....50c
200 Caledonia (B H)....1
75 C Pacific....1.70
250 Dudley....90c
750 DeFrees....10c
100 Eureka Con....32@32½
620 Endowment....35@30c
490 Grand Prize....6⅞
250 Gila....25c
860 Goodshaw....30@40c
1000 Highbridge....2.45@2¼
50 Hussey....25c
405 Independence....1.05
50 Leeds....1
170 Leopard....50c
20 Manhattan....4
380 Mono....3
30 Modoc....50c
570 McClinton....25@30c
20 Martin White....4.10
300 Northern Belle....9½
350 Navajo....40@45c
800 Oriental....1¼
600 Paradise....2
450 Raymond & Ely....6@5
10 Silver King....8
60 S Xavier....1
810 Summit....1½@1.40
810 Star....50c
350 Tuscarora....10c
125 Tioga Con....1

Tuesday A. M., Jan. 7.

110 Alpha....11¾
215 Alta....5¼@5½
50 Andes....50c
500 Baltimore Con....1¼
295 Best & Belcher...18¾@18¼
850 Belcher....4.20@4.30
2490 Bullion....7@6⅞
370 Benton....3.20@3
845 California....11¼@11½
300 Caledonia....2.95@2.90
1025 Con Virginia....9½@9⅜
610 Con Imperial....80@85c
170 Chollar....45@45¼
710 Crown Point....3.90@3¾
200 Confidence....9
70 Challenge....1.70
1605 Exchequer....4⅞@4.65
460 Flowery....50c
905 Gould & Curry....10@10¼
970 H & Norcross....14@13⅝
145 Justice....4.15
610 Julia....3.95
200 Kentuck....3.90
475 Lady Bryan....55@65c
150 Lady Wash....80c
2105 Mexican....31@30½
660 New York....80@90c
2330 N Bonanza....1@1¼
155 N Con Virginia....5⅝
360 Ophir....33@33¼
410 Overman....10@9⅝
225 Occidental....75@65c
50 Phil Sheridan....35c
145 Sierra Nevada....41
900 Savage....13½@13¼
270 Silver Hill....1⅞@1.80
200 Succor....20@25c
3320 Trojan....60@50c
55 Utah....11½@11¼
165 Union Con....56
200 Wells-Fargo....15c
1745 Ward....75c
570 Yellow Jacket...14¾@14⅞

AFTERNOON SESSION.

1000 Argenta....2.40
125 Albion....50c@1
390 Bodie....6¾@8½
30 Bechtel....50c
1100 Belle Isle....20c
165 Black Hawk....20c
240 Belvidere....60c
370 Booker....50@45c
90 C Pacific....1⅝
20 Dudley....90c
365 Eureka Con....32½@32¼
150 Gila....20c
1010 Grand Prize....5⅝@5⅞
600 Goodshaw....35c
230 Hussey....25c
75 Hamburg....1½
800 Highbridge....2¼@2.30
550 Hillside....2@2.10
575 Independence..1.05@1.10
340 Jackson....9@8½
25 Leopard....50c
600 Leeds....1
435 Mono....3@2.90
170 Manhattan....4@4½
250 McClinton....30@40c
50 M White....4.05
40 Northern Belle....9¼
980 Navajo....45@35c
1170 Oriental....1¼@1.15
150 Paradise....2@2.05
370 Raymond & Ely....5¾@5½
500 S Standard....25c
695 Summit....1¼@1.40
300 Tiptop....1¼
170 Tioga Con....1.10

Wed'sday A. M., Jan. 8.

15 Alpha....11½
510 Alta....5¼@5
50 Andes....50c
675 B & B....16½@16¾
1490 Bullion....6⅞@6½
535 Belcher....4@3.90
790 Benton....3¼@3½
500 Baltimore Con...1.40@1½
10 Chollar....44
210 Con Virginia....8⅝@8½
315 California....11@10⅞
435 Crown Point...3.70@3.60
590 Caledonia....2¾@2.80
820 Con Imperial....80@75c
150 Con Washoe....2.10
20 Confidence....9
150 Challenge....1.70@1.60
1220 Exchequer....4½@4.60
200 Flowery....50c
300 Gould & Curry....9⅝
155 Hale & Nor....13@13⅜
175 Justice....4.05@4
1725 Julia....3.40@3¼
5 Kentuck....4
100 Kossuth....20c
100 K Star....2⅜
360 Lady Bryan....70@65c
55 Lady Wash....1
1450 Leviathan....60@65c
475 Mexican....31@30⅞
2370 N Bonanza....1½@1⅜
250 New York....75c
210 North Con Vir....6¾@6
425 Overman....9⅞@9½
115 Ophir....33⅞
150 Occidental....65c
360 Phil Sheridan....40c
200 Succor....25c
50 Solid Silver....50c
170 St Louis....40@50c
200 Sutro....20c
215 Savage....12⅞
675 S Nevada....42½@43½
400 Silver Hill....1½@1.60
2200 Trojan....50@45c
490 Utah....11¼
285 Union....56½@56¾
700 Wells-Fargo....15@20c
360 Ward....70c
290 Yellow Jacket....14⅞@15

AFTERNOON SESSION.

900 Argenta....2.20@2¼
325 Albion....1
760 Bodie....8⅝@8½
380 Bechtel....60@55c
250 Black Hawk....20c
100 C Pacific....1.80
50 Dudley....65c
25 Eureka Con....32@31
600 Endowment....30c
100 Golden Terra....5⅞
635 Grand Prize....5⅝
300 Goodshaw....35c
50 Gila....15c
150 Hussey....15c
150 Hillside....2.10
450 Highbridge....2¼@2.20
100 Jackson....8½@8
300 Leeds....1
250 Martin White....4
120 Modoc....50c
30 Manhattan....4½
250 McClinton....40c
320 Northern Belle....9@8½
400 Navajo....40c
640 Oriental....95c@1.05
100 Paradise....2.10
350 Raymond & Ely...6½@6⅝
300 Summit....1½
440 Star....50c
500 Tuscarora....5c
70 Tioga Con....1.20@1.15
250 University....1

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Jan. 2.

110 Alpha....10½
605 Alta....5@5½
90 Best & Belcher....18
390 Belcher....3¾@3.80
2145 Bullion....4.80@5
295 Benton....2.90@3
1790 California....10⅝@10½
1185 Con Virginia....7¾@8¼
360 Crown Point...3.60@3.65
80 Chollar....44@45
75 Con Imperial....80c
310 Confidence....9
40 Caledonia....2.40
100 Challenge....1.65
300 Dardanelles....1.10
225 Exchequer....4.20
95 Gould & Curry....9@9½
155 Hale & Nor....11½
585 Justice....3.65
2110 Julia....4.70@4.90
20 Lady Wash....70c
100 Lady Bryan....70c
1075 Leviathan....45@50c
100 Morning Star....2½
355 Mexican....30½@31
400 New York....60c
850 N Bonanza....30@50c
100 North Con Vir....6½
190 Ophir....35@35¼
130 Overman....9½
1200 Phil Sheridan....25c
305 Sierra Nevada....41@42
415 Savage....9¾@10
200 Succor....20c
5 Seg Belcher....17
500 Senator....15c
1580 Silver Hill....1½@1¾
350 Scorpion....50c
140 Solid Silver....50c
200 Trojan....30c
350 Union Con....57½@58
60 Utah....11
1335 Ward....95c@1
260 Wells-Fargo....35c
30 Yellow Jacket....13¾

AFTERNOON SESSION.

1229 Argenta....2.65@2.70
1230 Bulwer....14
310 Bodie....7¾@7⅞
850 Bechtel....60c
100 Belmont....60c
200 Booker....50c
100 Belvidere....50c
25 C Pacific....1½
100 Day....25c
160 Dudley....1
350 DeFrees....15c
365 Eureka Con....32
660 Goodshaw....35@40c
630 Grand Prize....8¼@7⅞
5 Golden Terra....6
100 Hussey....25c
250 Highbridge....2½
175 Independence..1.10@1.15
150 Jackson....18
210 Leopard....60c
500 Leeds....1¼
900 Mono....2⅞
200 Manhattan....4¼
45 M White....4½
100 Modoc....55c
235 Northern Belle....9⅞@9¾
230 Oriental....65@75c
600 Paradise....2
100 South Standard....20c
400 Summit....1½@1.35
100 Sitting Bull....50c
100 Star....50c
250 Tioga Con....1.10@1.20

Thursday A. M., Jan. 9.

405 Alta....5½@5⅝
220 Alpha....12@11⅞
985 Best & Belcher..20¼@21½
1535 Bullion....7¼@7⅞
350 Belcher....4.10@4.15
400 Benton....3¾@3.90
1275 Caledonia....2¾@2.60
860 Con Imperial....85@80c
285 California....10¾@10⅝
835 Challenge....1.90@2
1285 Con Virginia....8½@8⅝
160 Confidence....9¾@10⅜
90 Chollar....45
240 Crown Point...3.80@3.90
300 Dardenelles....1.15
1105 Exchequer....5@5½
400 Flowery....50@40c
1225 Gould & Curry....11@11⅜
485 Hale & Nor....14¼
245 Justice....4.15@4¼
1595 Julia....3½@3.70
275 Kentuck....4
516 Lady Wash....1.20@1¼
320 L Bryan....75@70c
650 Leviathan....60@65c
85 Mexican....30½@30¾
150 Mides....50c
100 Morning Star....3
100 New York....70c
230 N Con Virginia....6@6¼
815 N Bonanza....1½@1.45
165 Ophir....34@33¾
100 Overman....9⅝
100 Occidental....70c
260 Sierra Nevada....43
325 Savage....13½@13¾
10 Seg Belcher....20
1330 Silver Hill....2@1.55
100 Succor....30c
680 Solid Silver....50c
1020 Trojan....50c
65 Utah....13¾@13⅝
360 Wells-Fargo....20@15c
750 Ward....75@80c
300 Yellow Jacket....16@16½

AFTERNOON SESSION.

2475 Argenta....1.30@1.60
300 Belmont....55c
125 Belvidere....50c
100 Belle Isle....15c
340 Bodie....8⅝
50 Black Hawk....25c
20 Booker....40c
10 Bulwer....14½
100 Bechtel....65c
170 C Pacific....1¾@1.80
200 Dudley....75c
640 Eureka Con....31½
485 Grand Prize....5½@5⅝
350 Goodshaw....35@30c
600 Highbridge....1¾@2
50 Hillside....2.10
510 Independence....1.05
90 Jackson....8
325 Modoc....50c
430 Martin White....3.90@4
80 Mono....2½
25 McClinton....40c
225 Northern Belle....8@8½
50 Navajo....45c
300 Oriental....75c
600 Paradise....2.20
10 Raymond & Ely....6⅞
300 Summit....1.60
300 Star....50c
225 Tioga....1¼
500 Tuscarora....5c
300 University....1

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journal

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	13	1 00	Dec 10	Jan 13	Jan 31	W H Watson	302 Montgomery st
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belmont M Co	Nevada	19	50	Nov 27	Jan 3	Jan 27	J W Pew	310 Pine st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Benton Con M Co	Nevada	1	50	Dec 11	Jan 15	Feb 3	W H Watson	302 Montgomery st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Bullion M Co	Nevada	8	1 00	Dec 3	Jan 7	Jan 29	Joseph Gruss	418 California st
Caledonia S M Co	Nevada	25	50	Nov 15	Dec 20	Jan 10	R Wegener	414 California st
Champion M Co	California	1	25	Nov 22	Dec 27	Jan 16	Jno Crockett	203 Bush st
Crown Point G & S M Co	Nevada	36	1 00	Dec 12	Jan 16	Feb 6	James Newlands	203 Bush st
Endowment M Co	Nevada	2	25	Nov 21	Dec 30	Jan 21	R H Brown	327 Pine st
Equitable T & M Co	Utah	19	05	Nov 7	Jan 2	Jan 21	S Healy	45 Merchant's Ex
Gould & Curry S M Co	Nevada	34	1 50	Nov 18	Dec 23	Jan 14	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	60	50	Dec 10	Jan 15	Feb 7	J F Lightner	58 Nevada Block
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Modock Con M Co	California	7	50	Nov 14	Dec 23	Jan 13	J W Pew	310 Pine st
Mono M Co	Bodie	2	60	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
North Bonanza M Co	Nevada	1	50	Dec 6	Jan 10	Jan 28	W W Stetson	309 Montgomery st
North Con Virginia M Co	Nevada	14	1 00	Nov 21	Dec 27	Jan 17	G C Pratt	309 Montgomery st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Feb 3	Mar 3	J L Fields	240 Montgomery st
Savage M Co	Nevada	36	1 00	Dec 4	Jan 7	Jan 27	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	G R Spinney	310 Pine st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 21	Feb 13	W H Lent	327 Pine st
Tuscarora M & M Co	Nevada	2	05	Nov 13	Dec 19	Jan 13	M E Sperling	309 California st
Vermont Con M Co	Nevada	2	15	Dec 7	Jan 9	Jan 29	E F Stone	306 Pine st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Arizona S M Co	Nevada	4	1 00	Dec 9	Jan 13	Feb 3	W Willis	309 Montgomery st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Jan 28	B S Kellogg	306 Pine st
Buckeye G & S M Co	Nevada	19	50	Nov 25	Dec 27	Jan 16	C A Sankey	331 Montgomery st
Catawha M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Challenge Con M Co	Nevada	1	20	Nov 22	Dec 23	Jan 14	W E Dean	203 Bush st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Colorado River C & G M Co	Arizona	3	50	Nov 29	Jan 2	Jan 18	H A Whiting	211 Sansome st
Eagle S M & M Co	Nevada	11	10	Nov 30	Jan 7	Jan 28	R H Brown	327 Pine st
Father DeSmet Con G M Co	Dakota	2	1 00	Nov 13	Dec 18	Jan 15	T Widmann	404 Montgomery st
Hazard Gravel M Co	California	2	06	Dec 9	Jan 8	Jan 24	J T McGeoghehan	318 Pine st
Lodi M Co	Nevada	1	25	Nov 20	Jan 7	Jan 27	O J Humphrey	328 Montgomery st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	318 Pine st
Magalia G M Co	California	1	10	Nov 22	Dec 27	Jan 16	T A White	113 Leidesdorff st
Mayflower M Co	California	2	15	Dec 7	Jan 4	Feb 4	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	24 Safe Deposit Build
Mineral Fork M & S Co	Utah	1	02	Oct 31	Dec 7	Jan 30	Otto Metchko	328 Montgomery st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 5	J Pentecost	511 California st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
Oriental Con G & S M Co	California	1	50	Nov 19	Dec 23	Jan 13	F C Mosebach	327 Pine st
Orion M Co	California	4	25	Dec 12	Jan 13	Jan 28	P Conklin	28 Sansome st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
Queen Bee M Co	California	1	25	Dec 2	Jan 6	Jan 27	T A White	113 Leidesdorff st
Summit M Co	California	6	05	Nov 19	Jan 6	Feb 4	J W Clark	318 Pine st
Summit G M Co	California	1	50	Nov 27	Jan 6	Jan 28	W H Lent	327 Pine st
Tiger M Co	Arizona	2	1 00	Oct 21	Dec 10	Jan 20	W H Lent	327 Pine st
Wall Street Q M Co	California	4	10	Nov 23	Dec 28	Jan 15	D K Tripp	401 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Argenta M Co	Nevada	R H Brown	327 Pine st	Annual	Jan 13
Aurora Tunnel M Co	Nevada	C V Hubbard	Cosmopolitan Hotel	Annual	Jan 20
California M Co	Nevada	C P Gordon	309 Montgomery st	Annual	Jan 15
Gila S M Co	Nevada	W W Parrish	328 Montgomery st	Annual	Jan 13
Iowa M Co		J H Leonard	607 Kearny st	Annual	Jan 14
Jefferson M Co	Nevada	C A Sankey	331 Montgomery st	Annual	Jan 23
Kossuth M Co	Nevada	E F Stone	306 Pine st	Annual	Jan 20
Manhattan Coal M Co		Henry Jung	306 Market st	Annual	Jan 14
Natoma W & M Co		H P Livermore	531 Market st	Annual	Jan 21
Nevada Gravel M Co	California	J Pentecost	511 California st	Annual	Jan 14
Oriental Con M Co	California	H C Hinman	327 Pine st	Annual	Jan 21
Raymond & Ely M Co	Nevada	J W Pew	310 Pine st	Special	Jan 28
Raymond & Ely S M Co	Nevada	J W Pew	310 Pine st	Annual	Jan 28
Sierra Nevada S M Co	Nevada	W W Stetson	309 Montgomery st	Annual	Jan 15

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Dec 14
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Jan 13

California Board—Latest Sales.

Wed'sday A. M., Jan. 8.

30 Alta....5½
130 Andes....50c
400 Atlantic....60@81½c
11000 Atlas....12½c
100 Almaden Q....30c
60 Best & Belcher..18⅝@18½
45 Belcher....4.10
90 Bullion....6⅞@6.60
60 California....11@11⅛
20 Chollar....43
30 Con Virginia....9⅞
200 Cosmopolitan....20c
200 Con Imperial....75c
55 Crown Point....3.65@3⅝
15 Caledonia....2⅝
190 Exchequer....4.30@4.40
20 Grand Prize....5¼
50 Gould & Curry....9⅞@9⅝
55 Hale & Norcross.13¼@13⅝
70 Justice....4.15@4
30 Julia....3½@3.40
150 Kossuth....20c
200 Leviathan....65c
400 Mint....19@20c
50 Mexican....31½@31
200 Mt Hood....12½@15c
130 New York....80c
300 N Sierra Nevada....5c
200 North Carson....21c
30 Ophir....33½
20 Overman....9¾
30 Savage....12⅞
400 S Europa....90c@1
400 Santiago....1@1½
1200 Trojan....40@46c
1200 U Flag....2c
150 Ward....70c
100 Wash Bon....20c
30 Yellow Jacket....14⅞

AFTERNOON SESSION.

105 Alexander....11@11¼
1800 Atlanta....14c
1075 Atlas....12½c
30 Alpha....11½
225 Almaden Q....20@15c
50 Alta....5
50 Bullion....7@7½
90 Best & Belcher...18⅝@18⅞
70 Belcher....4@4.10
110 Benton....3⅞
60 Con Virginia....8⅝@8¾
50 Crown Point...3.85@3.80
200 Con Imperial....80c
50 California....11@11⅛
130 Challenge....1½
40 Chollar....44
140 Caledonia....2¾
60 Exchequer....4⅝@4.60
80 Gould & Curry...10⅞@10¼
285 Hale & Nor....13½@13⅝
30 Julia....3½@3.40
95 Justice....3½
150 Kossuth....19c
50 Mexican....32
200 Mono....2½
275 Mint....19c
100 North Carson....24c
400 N Scorpion....25@15c
45 Ophir....34¼
100 Savage....13⅜
45 Sierra Nevada....44
370 Silver Hill....1.55@1⅝
560 Trojan....40@50c
55 Union Con....57@57¼
40 Yellow Jacket....14⅝

Pacific Board—Latest Sales.

Wed'sday A. M., Jan. 8.

120 Alpha....11½
100 Alta....5¼
255 Belcher....3.95
425 Best & Belcher...18⅝@18⅞
540 Bullion....6⅞@6½
220 Con Virginia....8⅞@8⅝
550 Caledonia....2¾@2.80
1320 Con Imperial....81@79c
130 Crown Point....3.70
215 California....11@10⅞
330 Exchequer....4.55@4½
20 Grand Prize....5
250 Gould & Curry....10@10⅛
370 Hale & Nor....12⅞@13⅛
610 Julia....3.30@3⅜
40 Justice....4
310 Mexican....30⅞@31¼
20 New York....75c
25 N Bonanza....1½
460 Ophir....34@34½
90 Overman....10@9⅞
150 Savage....12⅝@13
25 Seg Belcher....20
140 Sierra Nevada....43@43¼
15 Silver Hill....1.55
800 Trojan....45c
120 Utah....11⅜@11¼
20 Union Con....57
75 Yellow Jacket...14⅞@15½

AFTERNOON SESSION.

70 Alta....5¾@5½
20 Andes....55c
15 Belcher....4½@4.10
10 Best & Belcher....19¼
200 Benton....3½@3⅝
30 California....11
5 Con Virginia....9
75 Con Imperial....79@80c
65 Caledonia....2.80@2.85
55 Exchequer....4¾@4.85
30 Eureka Con....32½
50 Flowery....50c
60 Gould & Curry....10⅜
10 Hale & Nor....14
20 Justice....4.05
230 Julia....3½@3.45
100 Lady Wash....1.10
50 Mackey....1⅝
55 N Bonanza....1.45
55 North Con Vir....6
10 Ophir....31¼
60 Overman....10½@10
100 Phil Sheridan....50c
50 Savage....13½
20 Sierra Nevada....44@43¾
150 Silver Hill....1.65@1.70
270 Trojan....47@48c
120 Ward....74@75c
55 Yellow Jacket....15¼

THE *Times-Review* describes the late exceedingly rich strike in the 500 level of the Grand Prize.

The Bodie Mine Owners Probably Safe.

Geo. A. Nourso writes to the *Bulletin* on the subject of the Bodie land titles. It has been, he says, many years a question in the land offices and courts whether the United States act granting the 16th and 36th section of each township to the State for school purposes, would hold good when those sections included mineral lands. In Higgins vs. Houghton the Supreme Court of California during the April term of 1864 held emphatically that the 16th and 36th sections went to the State under any circumstances, whatever their character. The case of Sherman vs. Burch has been cited as affirming this decision. That is a mistake, for in this case the land in dispute was agricultural, *not mineral*. Our Legislature has claimed, in accordance with the Higgins and Houghton decision, in the "act regulating the sale of mineral lands belonging to the State," approved March 28th, 1874.

The case most in point is thus stated by Mr. Nourso.

This question came up in the United States Land Office, in the matter of the application of the "Keystone" and other mining corporations for patents from the United States for their mines and mining claims. These were in Amador county, on a section 36.

One Henry Casey had applied to purchase from the State the half of the section 36, which embraced these mines, and the State of California, through him and his counsel, opposed the issue of patents to the mining companies on the ground that the title of the whole section had already vested in the State of California by the school land grant of all sections 16 and 36. No means were left unemployed to impress this view upon the United States land officers.

As attorney for the mining companies, I claimed, among other points, that mineral lands in sections 16 and 36, do not pass by virtue of that grant, but remain the property of the United States. After a contest of great bitterness the decisions of the Land Department of the United States, sustained this view.

The United States Register and Receiver at Sacramento, the Commissioner of the General Land Office of the United States, and finally, the Secretary of the Interior, sustained the claims of the mining corporations, after full and elaborate argument at each stage of the proceedings, adopting this view of the operation of the school land grants.

After the mining companies had obtained their United States patents, the grantee of Cary D. W. Gillett, armed with a State patent for the half section, brought suit against the "Keystone Con. M. Co.," in the Twelfth District Court, for the possession of their mine, which had been in possession of themselves and their grantees for over 20 years.

The action was transferred to the United States Circuit Court (the plaintiff being a citizen of New York), and was tried during the past year before the Hon. Lorenzo Sawyer, Judge of that court, without a jury. It was elaborately argued in printed briefs, and considered by Judge Sawyer with even more than his usual thoroughness—the amount of stake being very large. He rendered an oral opinion thoroughly discussing the matter, and, as one of the grounds of his decision in favor of the Keystone Co., he held that the school land grant of March 3d, 1853, was not intended to embrace, and does not embrace any sections 16 or 36 which are mineral lands.

As yet there has been no writ of error sued out in this case. If it shall go to the Supreme Court of the United States, we shall probably have a final decision of this mineral land question. I cannot doubt for a moment that Judge Sawyer's decision will be sustained.

Mining Share Market.

The stock market continues dull and heavy, not the slighest animation being apparent. This state of affairs is in strange contrast with the excitement existing a few months ago, when everybody was going to make a fortune in shares. How the brokers make both ends meet, it is difficult to say, but it is not probable that we shall have any very sharp rises or falls for a while yet.

As far as the Comstock is concerned the work of development continues, more particularly in the direction of pumping, however, and draining mines, with no present startling results in the way of dividends. The flow of water is very strong in most of the principal mines. The lightning drift of the Hale & Norcross will connect with the Combination drift in a couple of days more. After that it will probably take some time to get everything in readiness, when it will take but a very short time to rid the flooded mines of water and give a chance to get at and develop the ore prospects known to exist on the lower levels of both the Savage and Hale & Norcross mines.

Spanish brigands have been troubling France.

Ex-Governor Bravo, Mexican revolutionary leader, has been killed.

It is semi-officially reported in Vienna that Russia has promised to evacuate Bulgaria and Roumelia the first of April.

The plague in Astrakhan has lately increased in virulence.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Plymouth.—The Jackson *Dispatch* of Jan. 4th reports that the Empire mine is still pauning out her regular returns of $20,000 to $30,000 each run.

Marble Quarry.—*Ledger:* The machinery has been thoroughly overhauled, new saws put in, T railroad iron laid for the cars to run on (which is a great improvement upon the old style of sheet-iron track), also new blocks and tackle rigged for the hoisting apparatus. On account of the lack of water, the saws are at present run by steam. The quarry, under the supervision of W. H. Coleman, is steadily improving, the marble being softer and whiter, according as the quarry is developed. There are now hundreds of tons of excellent marble in sight.

Coney Mine.—Jackson *Dispatch*, Jan. 4: This mine, which has been lying apparently dead for about nine years, we understand will certainly be started up in a very short time. It is said that excellent new machinery has already been engaged and will likely be here in a few days. A mill site has also been located just below the mine, where an excellent water power can be obtained from the Moore mine ditch. The working of this mine, which our people have so long expected and desired, will prove of much importance to Jackson, as it will doubtless give employment to quite a number of miners and workmen. The mine is principally owned by Dr. Zeile, of San Francisco, a man of immense wealth, and one of great mining experience. The mine, we believe, is hereafter to be known as the Zeile mine.

Other Mines.—The shaft of the Good Hope is to be enlarged and retimbered. The Moore mine ditch is now nearly ready for the laying of the pipe, most of which is now on the ground. It is reported that the Seaton mine, near Drytown, has been bonded for five years, by the English company that own the Original Amador. Parties have been negotiating for some time with a view to purchase the Crown Point and Bonanza mines, at Drytown. Good rock is being taken from the 1100 foot level of the Oneida. Sulphurets from this work are being hauled from this mine to Garland's works, at Sutter Creek.

CALAVERAS.

The Upper Country.—*Chronicle*, Jan. 4: Six tons and a half of ore from the Buffalo mine near West Point, owned by Reed & Robinson, crushed in Harris' mill at Sandy Gulch, yielded 35 ounces of gold. That is an average of about $100 per ton; 13 tons were taken out altogether and the rock divided between the two partners. We did not learn how much the other portion of the ore paid. Nine tons of rock from F. Costa's mine, located near the North Fork of the Mokelumne, near West Point, yielded 61 ounces—an average of about $121 per ton. Seven tons of ore taken from Bill Deryer's mine, in the same district, paid 42 ounces.

EL DORADO.

Kelsey.—Placerville *Democrat*, Jan. 4: An expert has lately examined the Gold Deposit mine. The tailings from the mill assayed $44 per ton, and the sulphurets "went way up," some samples reaching the enormous sum of $24,000 per ton. It has been decided by the company to let the mill stand inactive until the concentrating works are up, as it is evident that all the sulphurets are very rich, and so long as there is any loss of them there will be a corresponding loss of gold. In the meantime the sinking of the shaft will be prosecuted as fast as heretofore, so as to bring as large a body of ore in sight as possible. The Estrella mine will probably be placed on a working basis in a short time. From the well-known richness of this mine it is quite strange that it should have lain idle so long. The lode is one of the largest in this section. It has been prospected to a depth of 50 feet, with good prospects.

LOS ANGELES.

Gold in our Streets.—*Herald*, Jan. 4: Some excitement was created in Los Angeles New Year's day by the discovery, on Olvera street, near the Hotel di Roma, in the public roadway, of placer gold, of a very promising appearance, by Councilman John Shaffer. That gentleman's attention was attracted to some specks of free gold which was made apparent by the wash of the late rains. He procured a shovel and pan and went to work. From a single shovelful he washed out wire gold to the value of 25 cents. Later in the day other prospectors started in, and one amongst them washed out a nugget of virgin gold which weighed $1.25. Claims have been staked out in the neighborhood of the discovery, and our very streets are liable to be uprooted in the eager quest for gold. Mr. Pelanconi says that when he was making the excavation for his cellar, free gold was frequently seen by the workmen. In every case actual washing out resulted in a yield of from three to ten cents a pan. It is just possible that the rocker and pan of the old mining days may soon become a familiar spectacle in our streets. We shall await future developments with an absorbing but kindly curiosity.

MONTEREY.

Mount Carmel Coal.—Salinas Valley *Index:* The latest developments and a thorough examination and survey of all outcroppings show a most favorable result. There are three distinct veins—the east, center and west vein—averaging from four to nine feet in thickness. The quality of the coal is equal, if not superior, to any in the California market. It sells for $10 per ton in San Francisco, and the screenings bring $6, which is better than Australian coal. It burns with a strong, steady flame and is an excellent steam generator. At present the facilities for getting the coal to market are very primitive; but a railroad has been decided upon, which will better matters greatly.

MONO.

The Bodie *Chronicle* of Dec. 28th reports as follows on the mines:

Standard.—Latest official report is that the crosscut east from the main shaft is in 85 feet; progress for the week 22 feet. At a point 70 feet from shaft a ledge was cut which is three feet wide. The south drift from this crosscut has been advanced during the week 13 feet, total length, 63 feet; ledge four feet wide. The east crosscut being run on the 300 level south of incline is in 112 feet. Raise north of incline on same level is up 95 feet. The ledge is three feet wide and looks well. The stopes continue to look well, and yield the usual quantity of ors. Mill is running steadily.

Con. Pacific.—The south drift in No. 1 is in 30 feet and ore improving. Drifting for stations to take out ore. Commenced sinking this week in No. 2; down five feet. Main shaft down 159 feet; progress this week, 12 feet. Work progressing satisfactorily.

Mono.—Shaft down 370 feet; bottom shows seams of quartz and much clay, and works well. The crosscut is in 130 feet; the face shows some small streaks of low grade ore, lying very regular, and dipping to the east. Indications are favorable for nearing the vein. Everything is working in excellent order, and a six months' supply of timbers, lumber and fuel is on hand.

University.—Shaft down about 143 feet; drift in 145 feet. Good ledge which assays well, and the prospects are good. A whim will soon be erected. H. E. Ashley has been appointed Superintendent.

Booker.—Shaft down 335 feet; rock hard and little water.

Jupiter.—This mine is east of, and joining the Bodie. The shaft is down 136 feet, and is two compartment, 4x4½. At 126 feet a fine looking vein of three feet, with promising assays indicating a valuable mine, was struck.

Tioga.—Shaft down 360 feet in favorable formation; vein nice-looking, 13 inches wide in bottom, with fair prospects. West crosscut in 38 feet; cut a six-inch seam of quartz, low assay. East crosscut in 45 feet; also have a seam in this cut, with low assays. The hoisting works are in good condition, and everything goes well.

South Bodie.—Shaft, double, down 381 feet. At 351 feet past ledge; drifted 10 feet, then resumed sinking to crosscut at 500 feet. Progress this week 15 feet, the rock being hard.

California.—Sbaft down 140 feet; east drift in 36 feet; west, 24 feet.

Bulwer.—Ledge in south drift is two and a half feet wide and continues to look well. The Stonewall stopes also present their usual good appearance. Have shipped to date 405 tons of ore of good quality to the Bodie mill.

NEVADA.

Jacobs and Sargent.—Nevada *Transcript*, Jan. 3: The shaft of the Quaker hill claim is down 200 feet, and a drift has been run along the bedrock in a westerly direction for 250 feet. From the end of this an upraise is to reach the gravel. A few hundred feet from the present shaft, large quantities of gravel, paying as high as $5 per ton, have been taken out.

Plum Valley.—A tunnel has been run 100 feet; a shaft sunk 80 feet. The ledge in the tunnel is two feet wide; 100 tons of very good rock has already been taken out. All this has been done since June last.

Items.—The *Herald* says, that it is not unlikely that the whole property of the Empire M. Co. will go to the hammer on the 18th inst. The Nevada County Mining Association have leased the North Star mine, and will promptly resume work in spring. In 1871 this mine divided $76,500 among its shareholders. The Swiss American company will soon start up work again on the Victor, Massachusetts hill. The Pacific mine is being worked on tribute, the lessees paying 55% of the mill proceeds. There is no new development from the New York hill mine. The Rocky Bar is still taking out rich rock. The Scadden Flat M. Co. has completed the erection of its extensive machinery, and will push ahead vigorously. Mr. John Pattison has gone up near Omega to select a suitable place for starting a tunnel, on the ground of the Nevada B. G. Con. M. Co. The new mine on Little Deer creek, the Lincoln, has a ledge from 10 to 12 inches thick; and will in a short time have ample water power. Four pans from Shearer & Co.'s claim in the Round Mountain mining district, lately yielded $1.50. It is said that signs of richness and permanency in this district increase daily. The Yuba River M. Co. have run a tunnel 300 feet under the river, at Long's Bar, and struck gravel that pays $3 to the pan.

Mining Under Yuba River.—*Herald*, Jan. 4: The following claims are located along the river, the object of whose owners is to reach the beds of the present river channels: Yuba, Long Bar, West Point, Nichols' claim, Olmsted, North Star, Sand, Flat, Ohio and Tennessee. These companies are all corporations, and the larger part of the stock is held in Grass Valley. There are many places under the late river channels which have never been worked, the tailings from the larger mining operations above coming down and covering them up. Formerly miners tried working these places by wingdams and other contrivances to turn the water when it was low, but the debris has become so deep that it took nearly all summer to get down where the good pay was, and then the high water would come and wash away the dams and fill up the holes so that the same work would need to be repeated each summer, and the gravel has become so deep in the modern river beds that it made the season too short to enable advantageous work. Now a shaft is sunk on the bank and tunnels are run under the river bed, in search of pay gravel.

SAN LUIS OBISPO.

Placer Mines.—San Luis Obispe *Tribune:* In the eastern portion of township No. 30 south, range No. 16 east, Mount Diablo meridian, about five miles S. W. of the La Pansa ranch house, well up, and contiguous to the highest peaks of the Pansa mountains, on the headwaters of a creek emptying into the Estrella creek a couple of miles to the south of Pausa, the San Luis Obispo placers are located. They were discovered in last September by a man named Trujillo. As yet gold in paying quantities has been found only in Trujillo gulch and one tributary. From the forks of the creek where the discovery was made, gold has been found and claims staked off extending down the ravine a distance of three quarters of a mile, and up the north and south forks each, for perhaps half a mile near their sources where they debeuch from the main sierra. The character of the gold is what is generally termed coarse, ranging from a color up to chunks of $20 and $25. A nugget weighing $25, with some particles of quartz attached, and containing perhaps $20 of pure gold was found. There is, however, some mystery clinging to this nugget. The quartz ledges from which this placer gold has been washed have probably not yet been discovered, though some good looking rock has been located. On Dec. 16th a district was organized, to be known as the San Jose and La Pausa; headquarters at La Pansa. Messrs. Carroll, Garcia and Lopes were appointed to draft rules and regulations. Says the Salinas City *Index:* The San Jose valley above referred to is situated on the headwaters of the Salinas river, 20 miles in a southeasterly direction, from Santa Margarita, ensconced between the La Pansa mountains on the north and east, and the Santa Lucia or Coast Range on the south, with the main branch of the Salinas river running through the southerly and westerly portion. Surveyor E. K. Harris, of San Luis Obispo, says: "There are two routes leading to the new placers, either by the way of San Jose valley, where wagons will have to be abandoned, and horse or foot resorted to over the rough mountain trail already described; or the more roundabout way, by the Rocky canyon, Mitchell's and La Pansa. Those traveling in wagons I would advise to take the latter route, as a pretty fair wagon road leads to within one mile of the mines."

SHASTA.

Furnaceville.—Reading *Independent*, Jan. 2: Clark & Co. have commenced work on the "Homestake" claim. This claim was the first location made in this district, several years ago—then known as the "Silver Creek Ledge"—and, of course, as the district went down, the claim was abandoned. The mill or furnace then constructed (burned down in 1871 by mountain fires) was supplied with ore from this mine, the assays being favorable. The ore obtained is richly argentiferous galena; but the company used what they called a "water blast," and produced a heat so intense that the valuables escaped in the form of vapor.

NEVADA.

WASHOE DISTRICT.

Con. Virginia.—Gold Hill *News*, Jan. 8: The southwest drift at the 2150 station of the C. & C. shaft is now in 118 ft., and is advancing 4 ft. per day, the face still in blasting porphyry. On the 1900 level the station in the joint east crosscut on the Best & Belcher line is completed, and sinking the winze to connect with the level below has been commenced. This crosscut will now be continued to the eastward to better define the eastern limits of the ore vein in that direction.

Ophir.—Daily yield, 70 tons of ore. The ore stopes on both the 1900 and 2000 levels continue to show well and yield rich ore. The severe freezing weather still continues to interfere very materially with the operations of the Carson river mills.

California.—Daily yield, 340 tons of ore. This ore is being reduced at the California mill as fast as it is extracted, and gives good returns. The usual monthly dividend of $1 per share, aggregating $540,000, was declared yesterday. The ore stopes still continue to look well.

Julia Con.—But little progress has been made during the week in the main southwest drift on the 2000 level. The flow of water from the face is yet both strong and hot. The water as it flows from the drill holes shows a temperature of 75° to 80°. The last set of holes fired in the face of the drift threw out quartz showing fine veins of ore which give excellent assays in both gold and silver. The flow of water is so strong and hot that the pumps are kept busy to prevent flooding.

Sierra Nevada.—The stone foundations for the new air compressor are rapidly nearing com-

Continued on page 28.

Mines and Works of Almaden.—No. 17.

Translated for the PRESS from "ANNALES DES MINES."

The results obtained from the Idria furnace have been already given. We will only recall that the loss of mercury was definitely proved not to go beyond 5.59% of the mercury contained.

The Pellet furnace gave for 114 tons of ore, of a contents of 8.30%, containing 9,466.134 kilograms of mercury:

	Kilograms.
Mercury coming directly to the store house	7,660.55
80% of mercury from residues	470.714
Total	8,135.264

Loss, 1,330.872 kilograms, which is 1.16% of the ore, and 14.05% of the mercury contained.

The expense of treating 114 tons of ore were:

In the Idria furnace	371.80 frs.
In the Pellet furnace	1,518.00 "

The Pellet furnace was much inferior also to the Idria furnacs from the point of view of hygiene; 35 workmen fell ill, attacked by ulcerations of the throat, the first results of mercurial vapors during the running of the new furnace in May and June.

Condemned a first time, M. Pellet did not acknowledge himself beaten; in spite of the considerable expense of the first trial, in spite of the inutility of attempts to prevent a loss which did not exist, he obtained in 1872 a new seeries of comparative tests under the direction of MM. Luis de la Escosura, Inspector-General of Mines, and Federico de Botella, Engineer in Chief. The tests had two objects: First, to judge of the value of the Pellet system, which was once more, and this time irrevocably condemned, and then to study for themselves the methods of treatment with the Idria and Bustamente furnaces.

The details of these tests have not been communicated to me, they will make the object of an approaching publication of M. Luis de la Escosura: I know only that they have been made with a most minute attention, in order to determine with the utmost exactness the contents of the charges, their weight, the weight of the products of all kinds, that they have determined with precision the temperature of the gases and the rapidity of the current at different points of the entire apparatus; finally that the losses of treatment have been found as 5½% for the Idria furnace, and 4.95% for the Bustamente furnace.

This last figure does not, it is true, represent the exact loss in the current operations, it was obtained in the experiments under conditions therefore of particular exactness; but it indicates that which may be, that which should be demanded of the Bustamente furnace, without modifying either the treatment or the furnace.

Not being able to reason upon the figures of the tests of 1872, we return again to those obtained in 1869 by M. Monasterio. We can arrive with him at a deduction not only of the loss from the metallurgical treatments, as compared with assay values, but also by a sort of synthesis, the loss as compared with all the mercury really contained in the ore.

Let us see in what manner:

The ore is a quartzite more or less impregnated, or a schist more or less spotted with cinnabar. It contains carbonaceous matter (in the schist and in the black quartzite), a little iron pyrites, of native mercury, and of horn quicksilver. According to the manner in which these substances behave in the roasting, we may divide them into fixed and volatile substances, (mercury, sulphur, water, etc).

The residue of the roasting at the Idria furnace has given for 114.000 kilograms of ore, 102,336 kilograms of slag, or 89.768% of fixed matter and 10.232% of volatile matter.

Or, if in the assays of the laboratory, the determination of the richness in mercury is difficult to obtain with a very great precision, it is not so with regard to the fixed matters, and we can from this last weight deduce that of the volatile matter.

We will neglect in this calculation the possible presence of a small quantity of native mercury and of chloride of mercury; we admit that all the sulphur disengages itself in the state of sulphurous acid; we do not take account either of the sulphur of the iron pyrites, partially replaced by oxygen during the roasting, or the carbon of the ore; these two last simplifications will have for a single effect the augmentation to a small amount, the figure which calculation will give us for the mercury.

We suppose then, in short, an ore reduced to these essential elements:

Fixed matter, cinnabar, water. We can not take the water which is contained in the ore as it comes from the mine, and which exposure to the air in winter and in the times of rain can not but augment. The memoir of M. M. Bernaldez and Figueroa gives upon this subject the following figures:

	Contents in Water.
Metal and China of 1st class	0.08%
China of 2d class	0.08%
" " 3d "	0.15%
" " 4th "	0.20%
" " 5th "	0.25%
" " 6th "	0.50%
" " 7th " and solera	0.70%

The proportion of water is the greater, the smaller the amount of mercury there is present, because the poor ores are argillaceous, and therefore retain better the moisture than the rich and quartzose ore. Now the roasting of the ore in the muffle at a temperature gradually increasing, with a strong fire at the end of the operation, in such a manner as to expel all the volatile matter, has given for the different assays taken:

Classes.	Fixed Matters.	Volatile Matters.
Metal and China, 1st Class	70.00	29.10
China, 2nd Class	80.09	19.01
" 3d "	82.75	17.25
" 4th "	89.29	10.71
" 5th "	93.40	6.60
" 6th "	96.00	4.00
" 7th "	97.00	2.40

If now we subtract from the figures giving the total volatile matters the ones just given for the water, there remains for contents in sulphide of mercury:

	Sulphide of Mercury.
Metal and China, 1st Class	29.02
China, 2d Class	10.83
" 3d "	17.10
" 4th "	10.51
" 5th "	0.35
" 6th "	3.50
" 7th "	1.95
Solera	1.70

And as the sulphide of mercury contains 86.29% of mercury and 13.61% of sulphur, the different classes of ore contain:

Metal and China, 1st Class	25.04	While the assays at the laboratory have given:	25.00
China, 2d Class	17.11		17.06
" 3d "	14.75		14.66
" 4th "	9.07		8.88
" 5th "	5.48		4.99
" 6th "	3.02		2.46
" 7th "	1.68		1.03
Solera	1.40		0.80

We shall return to these last figures in an instant, in order to draw from them some consequences from this point of view with regard to the essaye of cinnabar in the laboratory.

Let us calculate now from the preceding figures the complete composition of the 114,000 kilograms employed in the experiments in question. We find then:

Quantities Treated.		Weight of Matters Contained			
		fixed mat'rs	Water.	Sulphur.	Mercury.
		Kilog.	Kilog.	Kilog.	Kilog.
1st Class	21,050	14,945.72	10.864	383.084	5,728.432
2nd "	9,840	7,830.856	7.872	207.643	1,083.624
3rd "	8,920	7,381.300	13.380	209.630	1,315.700
4th "	3,100	2,821.564	6.820	45.504	286.012
5th "	4,480	4,184.320	11.200	38.976	245.504
6th "	5,400	5,184.000	27.000	25.920	163.080
7th "	32,500	32,031.72	234.040	90.594	583.136
Solera	27,000	26,907.60	139.200	66.240	402.960
Total	114,000	101,967.08	510.476	1,583.398	9,939.048

The practical operation gave a residue of 102,336 kilograms of slag, 368.92 kilograms more, consequently than calculation would indicate.

Proportion of slag produced	89.768%
" calculated	80.444%

Admitting even the most exact weighing of the slag, we might explain this very small difference, by the small amount of mercury retained in the slag. We can then with fear of being deceived in the least, take the figure of 9,939.048 kilograms as representing the maximum of mercury, contained in the 114 tons of ore. The loss from the assays would then be at most, 0.41% of the ore, or 4.75% of the mercury contained. Finally, the loss of the metallurgical treatment would be 1,002.264 kilograms, out of the 9,939.048 contained, or 10.08%, at a maximum. There is besides the amount of the loss determined by the contents as given by the assays, here 5.59%, which is truly entitled to be taken into consideration in an industrial operation.

Let us return for a moment to the contents given by the assays, at the laboratory, in order to compare them with the results of the preceding calculation. The following table gives the absolute, *A* the relative loss from the assays; we should not forget also, that these figures are the maxima.

CONTENTS OF ORE IN 100 PARTS.				DIFFERENCE, Or Loss from Assay.		
	Calculated.	Assay A.	Assay B.	Value taken as most exact	Absolute.	Per Cent of Mercury Contained.
1st Class	25.04	25.00	24.95	25.00	0.04	0.160
2nd "	17.11	16.90	17.06	17.06	0.05	0.290
3rd "	14.75	14.60	14.66	14.66	0.09	0.610
4th "	9.07	8.84	8.88	8.88	0.19	2.050
5th "	5.48	5.39	4.99	4.99	0.49	8.941
6th "	3.02	2.39	2.46	2.46	0.56	18.543
7th "	1.68	1.04	1.05	1.05	0.63	37.500
Solera	1.46	0.51	0.80	0.80	0.66	45.205

The assay marked *A*, was made at the assay laboratory, of the school of mines, at Madrid; the method employed, was the distillation of ore mixed with iron filings. The assay marked *B*, was made at the laboratory, at Almaden, by mixing the ore with its volums of quicklime, and one-tenth of its volume of carbonate of soda. The figures of the fourth column, are the result of the two preceding ores. We have always taken the higher figure, as the one approaching more nearly to the truth. The fifth and the sixth columns, show the losses absolute, as well as relative, they increase as the richness of the ore assayed diminishes. This result is in accordance with that of the experiments of M. Glowaky, at Idria, cited by M. Huyot, in a memoire in the *Annales des Mines* in 1854, (Fifth serie, stome V.) and in general with the results of all assays, which give contents more and more inexact in the same ratio, as the ors becomes poorer.

The reasoning which leads to this conclusion is, it is true, not very convincing for the poorer ore, which may contain other volatile matters, as well as sulphur, mercury and water, in quantities hardly to be neglected in comparison with the small quantity of mercury which the ore contains.

Without then wishing to give to this discussion a weight which it in reality does not possess, we limit ourselves by repeating in resume:

1st. That the averags contents of the ore at Almaden does not go beyond 8% to 9%.

2nd. That the loss of mercury indicated by the assays does not go beyond 6% in the Idria furnace, and 5% in the Bustamente.

3d. That the loss of mercury contained, in calculating this from the most elevated figure, does not go beyond 10%; and in conclusion,

4th. That with regard to the apparatus in use at Almaden, while we cannot assuredly wish to call them less irrational, at the same time they do not present to such a high degree the defects with which they have been credited, or at least they have been much exaggerated, and that conducted with care, they give with a rich ore excellent results.

Is this saying, for that matter, that they should give up attempts at improvement, or that other works as those of Idria should obey a prejudice in abandoning them for a long time back? We do not think so. The difference in the nature of the ores treated at Idria or in California, can suffice to explain the difference of the results obtained and the abandonment of the apparatus of Almaden at Idria and elsewhere.

In the presence of the actual change of opinions of the Spanish engineers, upon the processes at Almaden, it is certain that a long time will pass before they dream of introducing any innovation of considerable importance; the great expense caused by the relative experiments of the Pellet system has put off for a long time all desire to make new trials. They do not give up, however, the idea of improvements which may be some time introduced into the treatment.

The following are some of the principles which M. Monasterio would have been in favor of applying when the opportunity offered to the solution of the problem:

1st. Continuous roasting. 2d. Absolute separation of the gases of the fire from those coming from the ore. 3d. Condensation with the aid of water in tubes of iron lined on the inside in such a manner as to protect them against the action of sulphuric acid, and bathed on the outside with water. 4th. Artificial draft. 5th. Separate treatment of the residues in retorts of iron or clay.

It is possible that some of the ideas of M. Monasterio may be applied when the results of the processes in use in America, on which they are actively engaged, are sufficiently known at Almaden.

But it is not my intention to extend myself at length upon the reforms which exist only as projects, and whose trial consequently will not be made for a long time.

[To be Continued.]

THE CLIFTON COPPER MINES.—On the eastern frontier of Arizona, at the town of Clifton, Yavapai county, near the New Mexican line, 500 miles east of Yuma, is one of the richest copper mines on this coast. So easily worked and so rich are the ores that it pays to transport them by team several hundred miles across New Mexico to Trinidad, Colorado, whence they are shipped by rail to Baltimore. The mine is in the hills some distance from the town, and the ore is carried in sacks on mule-back to the reduction works, some nine miles by the circuitous trail. The proprietors of the mine are about to build a railroad of 20-inch gauge for the purpose of saving this expense. The road will be five miles in length and will be the first narrow-gauge railroad in the Territory. Capt. N. S. Davis, a pioneer Californian and a well-known civil engineer, started shortly before the holidays to make the surveys and begin the construction of this road. He is under engagement for one year.

POSTMASTERS of the fourth class have been allowed commission on stamps sold. They will now be allowed commission on stamps cancelled on letters instead. It is believed that this change will increase the postal revenue about $900,000 per annum.

THE Mexican government has made arrangements for the payment of the third instalment of $300,000 indemnity to American citizens, due this month.

THE ENGINEER.

The Strength of Locomotive Boilers.

In view of the recent explosion of a locomotive boiler on the Central Pacific railroad, near the Summit, the following extract in regard to the sources of weakness in locomotive boilers, will be read with much interest by mechanics and engineers. The extracts are from a very suggestive article in the *Railroad Gazette* of Dec. 20th: Of late years, owing partly to the increase in the size of locomotive boilers, and partly to the numerous explosions that have occured, the thickness of boiler plates has been materially increased. Twenty-five years ago there were few, if any, used thicker than 5-16 in. Now, for the larger sizes of locomotives, plates are always ⅜ and in some cases 7-16 in. thick. Double-riveted seams were seldom found in the older boilers, whereas, now, it is the rule for horizontal seams, and in some cases for all others; and in the larger engines now in process of construction on the Louisville & Nashville railroad the former are treble-riveted. The object of this increase in the thickness of the material and in the method of fastening it together is to increase the strength of the structures; but a boiler is like a chain, the strength of which is only equal to that of the weakest link, and the misfortune has been that in attempting to increase in resisting capacity of boilers, some of the links have been very much neglected. A house painter who should fall from a scaffolding by the breaking of a rope would quite naturally get a stronger one if he survived the fall; but the strong rope would be of little service unless it were securely fastened. Without knowing any confirmatory facts it is safe to venture the opinion that many more accidents of persons falling from scaffolds are caused by insecure *fastenings* than by insufficient strength in the members of the structure. The unfortunate man who undertook to lower his wife from the window of an upper story of the Southern hotel at the time it was burned was not mistaken about the strength of the pieces of bedding which he tied together, but he had not the knowledge nor the skill to fasten them, and his knots slipped and his wife was killed.

The weakness of boilers arises generally not from insufficient material, and perhaps not as often from inferior quality, as it does from the weakness of the attachments of the various parts. Unless there is some reason for a contrary opinion, it may be assumed that riveted work will always be done badly. The chief defects of such work are out of sight, and to a great extent undiscoverable after it is finished. Mismatched and unfilled holes cannot be seen after the heads of the rivets are formed, and therefore such work is less subject to criticism and inspection, and consequently there is little rivalry or pride of excellence in doing it among mechanics. Without the very closest inspection it is always possible for a workman to hide his blunders and his carelessness. Then, too, there is no strong sense of the necessity of good work of this kind. There is generally a lack of what might be called mechanical moral sense in this respect, and an engineer who should insist upon having first-rate work would find it no easy task to have his orders executed.

In the construction and attachment of the braces, there is more carelessness and ignorance displayed than in any other part of boiler construction. These are seldom carefully designed, and are nearly always left to workmen to arrange. They are seldom deficient in the amount of material of which they are made, but very often in the methods of attachment to the shell of the boiler.

In the attachment of steam domes there is more disregard of the laws which govern the strength of locomotive boilers than anywhere else. In order to give access to the inside of the boiler a hole from 24 to 30 in. in diameter must be cut into the shell. To make up for this there is the flange which is formed on the base of the dome, and, in some cases, another flange which is turned up on the plate which forms the shell of the boiler. Both of these are cut away by the rivets so that their sectional area is diminished thereby. What is needed here, and what is used in Europe, is a heavy wrought-iron ring around the hole at the base of the dome. This can be riveted either to the boiler shell or to the dome, and in this way it will reinforce the strength of the boiler which has been diminished at this point.

Broken stay-bolts we have always with us. Our present knowledge of the subject has not been far supplied a remedy for the evil. All we can do is to supply such means as will enable us to discover the breakage as soon as it occurs. Hollow stay-bolts plugged on one side are the surest safeguard.

It is a little singular that more effort has not been made to overcome the effects of unequal expansion in locomotive boilers. If we reflect for a moment on what occurs when a fire is built in a locomotive boiler filled with cold water, it will be seen that there must be enormous strain exerted on it before the whole of it becomes heated. The first effect of the fire is to heat the fire-box plates and tubes. These must expand before the outside shell is even warmed. The expansion due to a rise of temperature from say 70° to 400° is about 0.002 of the length of the tube, which if 10 feet long would therefore be increased in length nearly a quarter of an inch. This pressure must be

exerted against the front and back tube-sheets and transferred to the shell of the boiler. The front tube-sheet cannot yield excepting to an almost inappreciable amount. The outside shell will be stretched and the tubes compressed somewhat under the strain, but after making allowance for these effects it will be seen that the greater part of the strain, due to the elongation of the tubes, must be exerted on the back tube-sheet, and this in turn is transmitted to the side-sheets and stay-bolt of the fire-box. It is no wonder they are broken.

It is remarkable that no one has devised any method of compensating or permitting this expansion of the tubes without subjecting the other parts of the boiler to excessive strains.

It seems as if there were some grave defects in the principles of constructing locomotive boilers. Whether they can be remedied it is too early to answer, but it is certain that much of the workmanship and the design of the details could be immensely improved without any increase of knowledge on the part of those who have charge of their construction, excepting that which every good mechanic should have, and which can be found in elementary books.

Boulder County Ore Product for 1878.

The *News and Courier* of December 27th, is authority for the following: On account of the many channels for the disposal of ore, especially the smaller lots of the higher grades—which in the aggregate amount to no mean sum—it is somewhat difficult to arrive at the ore product of a given section. Below, we give an approximation of the larger amounts which have been purchased, or treated within the county and handled as bullion, for the year just closing:

Bullion shipped by express up to the 20th inst.	$314,519.00
Same (estimated to end of year)	10,000.00
Purchased by Boston & Colorado Reduction Company's works at Black Hawk, for 10 months ending with October: Gold, $178,-000; silver, $73,000	250,000.00
Same, at Argo works for months of November and December (estimated)	50,000.00
Paid by Golden Smelting Company up to 23d inst., net	40,123.50
Add deductions for loss and treatment (estimated)	8,000 00
Small lots of rich ores shipped to Omaha and Newark, say	10,000.00
Ores shipped to other points, say	10,000.00
Bullion sent out of the county other than by express, say	20,000.00
Total	$713,642.50

This will probably be rather under than over the actual yield. The Trenton works at Golden are supposed to have purchased some ores in the early part of the season, and probably some of the Denver works bought small lots. The shipments to Omaha and Newark have fallen off largely of late years, but we are assured that they still receive occasional lots. Boyd's product all goes into the express company's shipments. But private individuals are often intrusted with small lots of bullion which are not thus accounted for. We are indebted to Prof. Gregory Board, of the Golden works, and to Mr. H. R. Wolcott, of the Black Hawk works, for some of the figures herein given.

SILVER CLIFF.—Carl Wulsten, in a letter to the Denver *Tribune*, dated, Rosita, Custer county, Dec. 8th, says: Silver Cliff to-day is as good a mining camp as Colorado can show, and its horn silver deposits will yield millions before they play out, if they ever will. I declare that they will turn into good silver bearing veins when properly developed. I have found horn silver with the same rock as at the Cliff eight miles from the Cliff and have traced the belt for 14 miles now. I have sauntered along the obsidian belt and made several valuable discoveries since I was last in the Cliff four weeks ago, and I am more than ever satisfied that the Silver Cliff mines will hold out, and that their belt extends southeast 14 miles. How does it happen that this same obsidian formation shows such regular extent and upon a straight southeast course? Is that evidence of a mere deposit or of a stratified volcanic dike in regular extension?

SINGULAR OCCURRENCE.—The fishing smacks along the coast of Florida, report a stream of fresh or poisonous water along the coast, that kills all the fish in its range. They report sailing for 200 miles through dead fish, covering the sea as far as the eye could reach with all the varieties. Immediately on the shore the water is salt and natural, while less than a mile off it appears of a red brick color.

PROFIT ON COINAGE.—After buying the silver for coinage, paying for the transportation, and allowing for wastage in the process of coinage, since the commencement of coinage of the standard dollar the Government has profited, between the legal tender value and the real value of bullion which it contains, to the amount of about $1,600,000.

COST OF THE ELECTRIC LIGHT.—The cost of the 16,000-candle power electric light at the Palace hotel, San Francisco, has been estimated as follows: Interest on the investment, wear and tear of the machinery, etc., is estimated at 1½ cents; cost of coal, 40 cents; carbon, 28 cents engineer, 10 cents; oil, etc., 3 cents; total, $1.25 an hour.

A NUMBER of horse cars were lately shipped to Calais, France, to be used in running from that place to the suburb of St. Pierre, over a road constructed with English capital. Orders are expected soon from other European cities.

Useful Information.

GLASS MILLSTONES.—The *Manufacturer and Builder* calls the attention of manufacturers who cast heavy pieces of glass, and also of millers, to a recent German discovery, that the finest flour is produced by those millstones which have the most glassy texture and composition, and the consequent discovery that pieces of glass combined in the same way as the French burr, and similarly grooved on their surfaces, will grind better than the burr millstones. The consequence of this discovery has been the invention of the glass millstones now made by Messrs. Thom, and used in Germany and Borkendorf with great satisfaction, as it is found that they grind more easily and do not heat the flour as much as is the case with the French burr stone. In grinding grist they run perfectly cold. In order to make such stones, blocks of glass of from six to twelve inches wide are cast in a shape similar to the French burrs, but more regular and uniform. They are connected with cement in the same way, and dressed and furrow cut with picks and pointed hammers; but it is believed that diamond-dressing machines might be profitably applied. It is said that these millstones, made of lumps of hard glass, do not wear away faster than the burr stones. Stones of four and a half feet in diameter, driven by six-horse power, ground 220 pounds of flour an hour, and did it remaining cold. The grist is drier, looser, and the hull more thoroughly separated from the kernel than is the case with other stones.

TO PREVENT RUST.—Prof. Olmstead, author of "Olmstead's Natural Philosophy," gives the following as a preventive of rust: For farm implements of all kinds, having metal surfaces exposed, for knives and forks, and other household apparatus, indeed for all metals likely to be injured by oxidation or "rusting:" Take any quantity of good lard, and to every half pound or so, add of common resin ("rosin") an amount about equal to the size of an egg or less—a little more or less is of no consequence. Melt them slowly together, stirring as they cool. Apply this with a cloth or otherwise, just enough to give a thin coating to the metal surface to be protected. It can be wiped off nearly clean from surfaces where it will be undesirable, as in the case of knives and forks, etc. The resin prevents rancidity, and the mixture precludes the ready access of air and moisture. A fresh application may be needed when the coating is washed off by friction of beating storms or otherwise.

DEPTH OF ROOTS.—Mr. Foote, in Massachusetts, has traced out the tap root of a common red clover plant downward to the perpendicular depth of nearly five feet. Hon. J. Stanton Gould followed out the roots of Indian corn to the depth of seven feet, and states that onions sometimes extend their roots downward to the depth of three feet; lucerne, 15 feet. Hon. George Geddes sent to the museum of the New York State Society a clover plant that had a root four feet two inches in length. Louis Walkoff traced the roots of a beet plant downward four feet where they entered a drainpipe. Prof. Schuhart found the roots of rye, beans and garden peas to extend about four feet downward; of winter wheat, seven feet in light subsoil, 47 days after planting. The roots of clover one year old were three and a half feet long; those of two year old plants four inches long.—*Factory and Farm.*

CEMENT FOR LEATHER.—Of many substances lately brought very conspicuously to notice for fastening pieces of leather together, and in mending harness, joining machinery belting, and making shoes, one of the best is made by mixing ten parts of sulphide of carbon with one of oil of turpentine, and then adding enough gutta-percha to make a tough, thickly flowing liquid. One essential prerequisite to a thorough union of the parts consists in freedom of the surfaces to be joined from grease. This may be accomplished by laying a cloth upon them and applying a hot iron for a time. The cement is then applied to both pieces, the surfaces brought in contact, and pressure applied until the joint is dry.

A LOCOMOTIVE IN A QUICKSAND.—A locomotive went through a bridge on the Kiowa creek, 42 miles east of Denver, Col., last spring, and instantly disappeared in the quicksand bed of the creek, baffling all attempts to recover it. For the past six months the search for the missing locomotive has been kept up, resulting in success a few days ago, when it was found buried 40 feet deep in the quicksand. The sand had been removed for a great number of yards around the scene of the disappearance of the engine, a hydraulic ram being used, the locomotive being found at last after a search of six months. The instance is one of the most remarkable on record.

ELECTRICAL TEST FOR OILS.—Prof. Palmieri, of Naples, has recently constructed an apparatus which allows the purity of oils to be judged of by the resistance that they offer to the passage of electricity. Olive oil—a poorer conductor than any other—is taken as the standard of comparison. The apparatus may also serve to reveal the presence of cotton in silk fabrics; for a very small proportion of cotton in silk tissues greatly increases the conductivity of the latter.

CELLULOID.—This substance, though prepared by Mr. Hyatt, an American, as long ago as 1869, has only lately been turned to much practical account. It is prepared by subjecting ordinary paper to the action of a mixture of nitric and sulphuric acids; washing this till all trace of acid disappears; drying the product, powdering the same, and mixing it with camphor; drying and repeatedly pressing this mixture, at last applying heat, when the celluloid appears in the form of transparent, elastic rods or slabs. As it is hard and not easily broken at ordinary temperatures, susceptible of high polish, and capable of being cut into extremely thin plates, yet elastic, and, at high temperatures, malleable, plastic and even fusible, it has become extensively used in the manufacture of the rims of eye-glasses, cheap ornaments, cigar cases, etc., and, when colored, as a means of imitating ebony, lapis lazuli and malachite. It has also been employed in making elastic belts, trusses, etc., and some of its applications in dentistry were patented as early as the year of its discovery.—*Moniteur des Produits Chim.*

RINSING WINE BOTTLES.—Bottles, after being some time in use, are apt to acquire a crust or coating very difficult to remove by ordinary rinsing. The *Bohmische Bierbrauer* gives the following methods for removing such impurities: 1st, soak them in permanganate of potash; 2d, rinse the bottles out with a solution of equal parts of muriatic acid and water; 3d, chloride of lime and water in the proportion of one ounce of the lime to two pints of water, and allow the bottles to lie in the solution for three or four days; 4th, strong sulphuric acid may be put into the bottles, which may then be corked and allowed to stand for a day or two. This should remove the strongest crust. Either of these four methods requires great care. The chemical should in all cases be carefully rinsed out with clean water, and it should be borne in mind that all acids are extremely injurious to clothes, etc.

CELLULOSE WASHERS.—For the purpose of packing joints which are to be hermetically sealed, as retort-connections, couplings, etc., where vulcanized rubber has usually been used, cellulose appears to be even a better material. It is very cheap, readily absorbs water at first, thereby becoming pliable, and adapts itself more accurately to the surfaces it is intended to make tight. If a joint is exposed to steam, and is to be frequently opened, the cellulose should be soaked in oil.

Good Health.

Milk in Medicine.

Milk and lime-water are now frequently prescribed by physicians in cases of dyspepsia and weakness of the stomach, and in some cases are said to prove beneficial. Many persons who think good bread and milk a great luxury frequently hesitate to eat it, for the reason that milk will not digest readily; sourness of the stomach will often follow. But experience proves that lime-water and milk are not only food and medicine at an early period of life, but also at a later, when, as in the case of infants, the functions of digestion and assimulation have been seriously impaired. A stomach taxed by gluttony, irritated by improper food, inflamed by alcohol, enfeebled by disease, or otherwise unfitted for its duties, will resume its work, and do it energetically, on an exclusive diet of bread and milk and lime-water. A goblet of cow's milk may have four tablespoonfuls of lime-water added to it with good effect. The way to make lime-water is simply to procure a few lumps of unslaked lime, put the lime in a stone jar, add water until the lime is slaked and of about the consistency of thin cream; the lime settles, leaving the pure and clear lime-water at the top. Great care should be taken not to get the lime-water too strong. Keep to the direction as to the consistency, and when the water rises pour it off without obtaining any of the lime.—*Herald of Health.*

ARTIFICIAL MILK.—The *American Journal of Pharmacy* says the best substitute for mother's milk, according to Martiny, is the yolk of a chicken egg, which weighs, on an average, 231 grains, and when diluted with two ounces of water of about 100° and 76 grains of milk sugar, has nearly the same composition as the milk in the first period of lactation. Subsequently, the fat and protein decrease, and to one yolk may be added four ounces of water, and 100 grains of milk sugar.

WEAK EYES.—Bathe in soft water that is sufficiently impregnated with spirits of camphor to be discernible to the smell—teaspoonful of spirits of camphor to tumbler of water. For inflamed eyes use milk and camphor, adding a little more of the camphor than above.—*Herald of Health.*

RAW OYSTERS are more digestible than cooked ones. It is believed by some that there is a true gastric juice in an oyster's stomach, which assists in digesting them. This, however, is not known with certainty.

TURNIPS and carrots contain about 90% of water. Their chief value is as a divisor of more nutritious food, to allow the gastric juice to act on it more readily, and as a relish.

SUGAR.—Is not sugar an objectionable article of food? Ans.—No. Sugar is a carbo-hydrate, and bears a close relationship to fat, only the latter contains about two and a half times as much force-giving quality. It is objected to sugar that it deranges digestion, obstructs the liver, spoils the teeth, and in many ways does harm—no doubt of it. Taken on an empty stomach, and in great quantities, sugar is injurious; but as a part of our food, and used in moderation, sugar is not only harmless but very beneficial. Children should be allowed a reasonable amount of sugar as a part of their meals, but candies, as generally sold, made partly of sugar or glucose, and many poisonous ingredients, should never find their way into the stomachs of our little ones. So, too, the syrups made by the action of sulphuric acid on corn-starch, or the refuse in corn-starch factories, making a beautiful golden-drip syrup, is a very dangerous article, spoiling both stomach and teeth. In using sugar or syrups, choose only the purest and best sorts, otherwise much harm will come from them. As you value teeth, stomach, and health, never use those articles of food manufactured in the chemist's shop; if you do, you must expect to suffer the consequences. Half the ills of life would be avoided by careful attention to the wise choice and adaptation of food to daily needs.—*Dr. Holbrook.*

RAW ONION AS A DIURETIC.—Dr. G. W. Balfour, in the Edinburg *Medical Journal*, records three cases in which much benefit was afforded patients by the eating of raw onions in large quantities. They acted as a diuretic in each instance. Case first was a woman who had suffered from a large white kidney and constriction of the mitral valve of the heart. Her abdomen and legs had been tapped several times, but after using onions as above she had been free from dropsy for two years, although still suffering from albuminuria. Case second suffered from heart disease, cirrhotic liver and dropsy. Case third had dropsy depending on tumor of the liver. In both of them the remedy had been used with good results. Both had been previously tapped, purgatives and diuretics alike having failed to give relief. All other treatment having failed to give relief, recourse was had to the onions. Under their use the amount passed steadily rose from 10 to 15 ounces to 78 or 100.—*Herald of Health.*

PHOSPHORUS A CURE FOR SCIATICA.—It is not ordinarily wise to try remedies for effecting cures which one finds in the newspapers. But where the ingredients are such that no harm can arise from their trial, and the source from which the prescription emanates is likely to be reliable, the afflicted will gladly try almost any remedy recommended. Dr. Volquardsen reports in Schmidt's *Dictionary* and the Pesth *Medico-Chirurg. Presse*, both good authorities, from which the London *Medical Record* copies, a case of sciatica which lasted for two years and defied all treatment. He then arrived at the idea of trying the internal use of phosphorus, which he prescribed in doses of 15 milligrammes (about one-fourth of a grain) three times a day. Three days sufficed to obtain a marked improvement, and three weeks brought a complete cure.

BRAIN POISONED BY TOBACCO.—A peculiar case of metal hallucination has just appeared in Battle Creek, Mich., in the person of a young man about 18 or 20 years old. He is a cigar-maker by trade, and has been in the habit of smoking from 10 to 30 "green" cigars daily. He has not drank liquor sufficient to produce delirium, and yet he is a raving lunatic, and suffers all the horrible phantasmagoria that pertain to the fully developed tremens. He has worked in and used tobacco ever since early boyhood. Of late years he had used it extensively, principally in strong cigars; and it is supposed that the nicotine has so poisoned and shattered his mind as to partly paralyze it, thus producing the disorder. He has been taken to the insane asylum at Kalamazoo for treatment.

DEPRIVATION OF SOLAR LIGHT.—It has been repeatedly claimed that depriving miners of solar light injuriously affects their health. This point has recently engrossed the attention of Dr. Favre at the Commentry collieries. He does not think that the mortality of miners must be attributed to the action of the deprivation of solar light upon the blood, and cites by way of confirmation that he examined the blood of certain of the horses which were kept underground all the year, and he found the normal number of corpuscles in the blood.

REMEDY FOR COLOR BLINDNESS.—*La France Medicale* states that M. Delbeuf has found that if a person afflicted with Daltonism looks through a layer of fuchsine in solution, his infirmity disappears. A practical application of this discovery has been made by M. Joval, by interposing between two glasses a thin layer of gelatine previously tinted with fuchsine. By regarding objects through such a medium all the difficulties of color blindness are said to be corrected.

A MAN WHO BURST.—A German medical journal gives an account of a man who literally burst from taking four plates of potato soup, and many (how many is not stated) cups of tea and milk, followed by a large dose of bicarbonate of soda to aid digestion. His stomach swelled enormously, and tore the diaphragm, causing immediate death.

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SAN FRANCISCO:
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☞Silver Plated Copper Amalgamating Plates, San Francisco Plating Works, E. G. Denniston, Prop'r. ☞The Frue Ore Concentrator, Adams & Carter, Agents, S. F. ☞Portable Engines For Sale, Joseph Enright, San Jose. ☞Dividend Notice—German Savings and Loan Society, S. F. ☞Delinquent Notice—Summit Mining Co.

The Week.

The week has shown us some little promise in the way of rain, hut the envious north wind hlew off the clouds before very much moisture was precipitated. Water is hadly needed everywhere except in the Comstock mines, where they have a surplus they would like to get rid of. Nothing startling has occurred in mining circles during the week just closed, nor have stock circles been at all agitated. S. P. Dewey has issued a pamphlet on the honanza mines of Nevada, in which he claims to expose gross frauds of the management. As far as we can see, from a casual examination of the pamphlet, it relates principally to a quarrel hetween the writer and the honanza firm. It contains, however, some diagrams of the mines, showing sections of ore bodies, etc. A feature of the week we ehould all note with pleasure, as showing our standing as a nation, ie the remarkable success of the funding scheme. In the first five working days of the new year, Secretary Sherman sold $28,000,000 of the 4% honds, a fact unprecedented in the history of funding operations. The banks which have 6% bonds on deposit with the Treasury to secure their circulation, are withdrawing them to sell before the premium drops off, and replacing them with 4% honds. This exchange, which has just commenced with regard to the seriee of 1867, will cause a demand of from $50,000,000 to $100,000,000 of 4% bonds.

The San Francisco Chemical Works.

We have of late frequently called the attention of our readers to some of ths more deserving technical industries which have grown up in our midst, and it is our intention to continue to do so from time to time, as ws helieve that it is to the intsrest of our readers and to the henefit of the coast that we should do so.

In furtherence of this idea we recently paid a visit to the new establishment of the San Francisco Chemical Works, at Berkslsy. These works are owned hy Mr. Eghert Judson, well known to most of our readers as the inventor of the "Judson powder," and hy Mr. J. L. N. Shepard. They were formerly situated in San Francisco, hut as the city extended itself to the suhurhs, it hecams necessary to find a more distant locality for them, and they were very wisely removed to Berkeley. The firm purchased what was formerly an island, ahout a mils north of the Berkeley landing, and is at present separated from the main land hy a low and nearly swampy tract, hut may be approached either hy the sandy heach or hy a good wagon road. These works are upon the shore of the hay, and a good landing is ohtained for sailing vessels hy a wharf which runs out to deep water.

The only products of manufacture at the present time are nitric acid, sulphuric acid and fine sulphur. Muriatic acid can he made at any time when it is called for, although there does not seem to he any very great demand for it on this coast, and the firm have already a quantity on hand sufficient to supply all the dsmand which may he made for a long time. The firm supply the U. S. Mint with the nitric acid for the separation of silver and gold in the bullion which they huy for coinage. The acid for this purpose is required at a strength of only 38° B. (ahout 55% of HNO_3), hut it must he very pure and especially free from chlorine. The sulphuric acid which the mint requires is 63° B. (ahout 82% of H_2SO_4.) Besides this they make stronger sulphuric and nitric acids for the manufacture of nitro-glycerine. The nitric for this purpose runs as high as 49° B. (a little more than 91% of HNO_3), and the sulphuric acid as 66° B. (89% of H_2SO_4).

The Sulphuric Acid

Is manufactured in the usual way by introducing the vapors of hurning sulphur, nitrous fumes and steam into condensing chambers of lead. The total volume of the lead chambers is 150,000 cuhic feet. The vapors after passing through these chambers escape through a coks tower through which water is constantly trickling. The diluted acid is concentrated in lead pans, which are economically heated hy the hurning sulphur, until the vapor of sulphuric acid hegins to be given off, when the now partially concentrated acid is conveyed into a series of large glass retorts which are arranged upon a step-like furnacs, so that ths overflow from one retort may pass into the next succeeding hy the action of gravity alone. The concentrated acid finally flows from the last retort into a cooling apparatus, and finally from this into the reservoirs of lead, from which it is conveyed to the landing in pipes, thus avoiding expense in the handling of material. The fumes from the hoiling acid pass into a special condenser made for the purpose, and are thus also utilized. The sulphur from which this acid is made was formerly ohtained from Japan, it is now ohtained in large quantities and in a state of great purity from Nevada. The acid at present made at the works is, we are informed hy Prof. Rising of the University, of great purity for a commercial article, and contains hardly any traces of arsenic, the usual impurity of sulphuric acid. The method of concentrating the acid in use at these works is a continuous method, and is on this account a great improvement on the old one in use at most places, which necessitates loss of time and lahor hy the intermittent nature of the process. Mr. Judson, during a recent trip to Europe, hought in London at an expense of some $5,000 or $6,000, a platinum etill, made hy a new method, in a solid piece of metal, without any of the usual jointings. By means of this apparatus, which will replace the last two of the retorts of glass, it is expected that a much more rapid concentration will he effected. The present capacity of the works is about 1,400 pounds concentrated eulphuric acid per day.

Fine Sulphur

Is also manufactured from the Nevada sulphur, hy a centrifugal mill, which produces sulphur almost as fine as flour of sulphur. This is largely used for the manufacture of ordinary hlack powder.

The Nitric Acid

Is manufactured from nitrate of sodium from Chile. The nitrate is kiln-dried hy the waste heat of the furnaces, and the sulphuric acid used to set free the nitric acid is of 66° B., and consequently the nitric acid produced is much stronger than would he otherwise the case. Eight iron retorts, holding ahout 1,000 pounds each are used, and the nitric acid vapor from each retort passes first through a series of eight halloons of glass, then through 10 earthenware jars of 35 gallons capacity, and finally through another series of eight glass balloons hefore it passes out into the tall chimney and into the air. The distilled acid is then hoiled until the chlorine is driven off. The nitric acid is not made by a continuous process as is the sulphuric acid, but a charge is run in each retort once in 24 hours. Ths total amount of nitrate of soda used per day is ahout two and a half tons.

The total cost of the entire plant for this manufacture is from $50,000 to $75,000, and including the land and other items represents an investment of nearly $100,000. There are 12 men employed in all. Mr. C. C. Judson is Superintendent.

The Annual Bullion Yield.

John J. Valentine, General Superintendent of Wells, Fargo & Co., has prepared the following annual statement of precious metals produced in the States and Territories west of the Missouri river, including British Columhia, and receipts in San Francisco from the west coast of Mexico during 1878, which shows aggregats products as follows: Gold, $38,956,231; silver, $38,746,391; lead, $3,452,000. Total gross result, $81,154,622—heing less by $17,267,132 than for 1877.

California shows an increase in gold of $2,068,000, but a decrease in silver, etc., of $1,323,000—a net increase of $745,000. Nevada shows a total falling off of $16,398,341; the yield from the Comstock heing only $21,295,043, as against $37,911,710 for 1877; a decrease of $16,616,667 from that locality. The product of Eureka district is $6,981,406, as against $5,676,057 for 1877; an increase of $1,305,349. Montana shows a marked increase, all in silver. Utah a falling of over $2,000,000, hut nearly $1,000,000 of it is caused hy the reduced valuation of silver and lead hullion. Although Colorado shows $1,680,802 less than for 1877, the yield has heen really greater, as reports to us for 1877 duplicated the product of certain localities, hut ths duplication was not discovered soon enough to be corrected in our statement for that year.

Statement of the Amount of Precious Metals Produced in the States and Territories West of the Missouri River During 1878.

STATES AND TERRITORIES.	Gold Dust and Bullion by Express.	Gold Dust and Bullion by other Conveyance.	Silver and Gold Dore Bullion by Express.	Ores and Base Bullion by Freight.	Total—Lead, Silver and Gold.
California	$16,482,389	$394,119	$ 809,481	$ 804,522	$18,920,461
Nevada	1,011,373		28,656,413	6,315,168	35,181,949
Oregon	986,647	302,251			1,213,724
Washington	952,806	100,278	227,231		1,373,311
Idaho	1,503,769	79,983	1,858,638	731,295	3,773,685
Montana	135,135	13,513	2,661,405	3,254,500	6,064,553
Utah	2,511,248	251,124	1,459,375	2,011,000	6,232,747
New Mexico	89,848	17,970	310,760	35,235	453,813
Arizona	199,911	10,911	1,116,006	951,555	2,287,983
Dakota	1,846,504	369,300	1,088,254	410,000	2,215,804
British Columbia	1,253,460				1,253,460
Mexico (West Coast)	90,741				90,741
Totals	$25,430,328	$1,975,399	$37,952,314	$14,740,581	$81,154,622

The hulliou from the Comstock lode contained 45% gold and 55% silver. Of so-called hase hullion from Nevada, 30% was gold, and of the whole product of the State, 35% was gold.

The gross yield for 1878, shown ahove, eegregated, is, approximately, as follows:

Gold, 48%.....	$38,956,231
Silver, 48%.....	38,746,391
Lead, 4%.....	3,452,000
Total.....	$81,154,622

All probahilities now indicate that the yield of gold and silver, from the sources named, for 1879 will not greatly exceed $70,000,000.

Following is the annual net product of lead, silver and gold, from 1870 to 1879, of the States and Territories west of the Missouri river, exclusive of British Columhia and west coast of Mexico:

	Lead.	Silver.	Gold.
1870.....	$1,080,000	$17,320,000	$33,750,000
1871.....	2,100,000	19,280,000	34,398,000
1872.....	2,250,000	19,924,429	33,177,395
1873.....	3,450,000	27,483,302	39,206,558
1874.....	3,800,000	29,699,122	38,466,488
1875.....	5,100,000	31,635,239	39,968,194
1876.....	5,040,000	39,292,924	42,836,935
1877.....	5,085,250	45,840,109	44,880,223
1878.....	3,452,000	37,248,137	37,576,030

The exports of silver during the present year to Japan, China, India, the Straits, etc., have been as follows: From Southampton, $29,000,000; Marseilles and Venice, $1,000,000; San Francisco, $9,000,000. Total, $39,000,000, ae against $105,000,000 from the same placee in 1877.

AN association offering homes in New Mexico, along a line of projected railroad, is attracting eome attention among Washington workingmen.

The Silver Producers.

Resumption of specie payments hy the Government of the United States being an accomplished fact, there is a propriety in asking afresh the question: Does the Government, in its coinage enactments noh (as is alleged) the silvsr producers of a fifth of their hard winnings out of the howels of the sarth? Or is the 20% discount on silver only the dropping of ths value of silver in the market of the world, caused hy over-production?

These are questions of vital interest to every miner and stockholder in our great cordilleran industry. For if it be true that the consumption and demand for silver is actually in excess of its production at the present time, the Gsrman demonetization is to be considsred as an adventitious drawhack to our silver intsrest, which calls plainly for a remedy. Such there must, and is now, within the reach and powsr of our independent specie paying nation.

A margin of one-fifth of the product, it will bs seen, is equivalent to more than ons-half of the net profit, which is thus lost, instead of rewarding the enterprising and ensrgetic silver miner.

For making the coin the United States pookets this fifth to the extent of its rsquirements for coinage. It matters little who gets the rest if the producer is rohbed. Yet of ths vitality of our silver intsrest there could he no hetter evidence than its ahility to hear up, as it has done, against odds. It would have shut down prohably, most of the coppsr, iron and coal mines in the country long ago.

Thsre are powerful conflicting interests represented in trade, banking and niniuy, on the currency question. But the currency question is now a thing of the past. The voice of these conflicting intersats has been heard so loudly and conflictingly through the press that to-day, when resumption is an accomplished fact, the currency question passes into history, leaving upon the minds of ths people something like ths impression of a muddle. It will hs easier, perhaps, to deal with ths silvsr question pure and simple.

One of the prominent questions now before Congress—which met on Tuesday of the past week after its holiday recess—is the "ounce dollar" proposition, a remnant of the currency muddle. Prohahly it will he readily disposed off. It is based upon the assumption that silver is not worth 412½ grains to the dollar of gold, but that it ought to bs worth about 480 grains, hecause 480 grains happens to he an ounce Troy. That, it is claimed, would maks an "honest dollar."

But the market determines what is an honest dollar; and tinkering legislation is not likely to improve its honesty. To have an honest dollar, the Government should make coinags as nearly free as possihls; thershy allowing silver to find its own proper level, in relation to gold. Mr. Valentine's report on the production of gold and silver for ths year 1878, does not hear out the assumption that the amount of the latter is disproportionate to that of gold.

Nor is it likely that the experiencs of the world for many centurics is to he set at naught touching the use of silver as a metal adapted to coinage, and for circulation as currency. Of the $300,000,000 of silver thrown out of circulation by Germauy, only about a fourth now remains unahsorhed after three years' time.

If all unnecessary and artificial restrictione in coinage, on the part of the American Congress were removed, the silver question would prohably soon settle itself; and the silver producers would get what they most assuredly deserve, their full and fair reward for engaging in an industry of the utmost importance to this Western country, and to the nation at large; heset at the same time with other than prejudicial legislation in regard to coinage, and from its peculiar nature calling for the largest enterprise, energy and capital combined.

OUR NEXT DECADE.—Mr. Hittell divides his Hietory of San Francisco into subdivisions embracing the "Indian Era," the "Spanish Era," the "Village Era," the "Golden Era," and the "Silver Era." It may he said that the same suhdivisions apply to the coast at large, in a degree—only substituting "Hudson Bay Era" and "Russian Era," for Oregon and Alaska respectively. On the whole our coast is scarcely heyond the Village Era; hut it is evident now that the *Coming Era* will be an era of towns. These towns will he huilt up hy *Railroads*. Next week we will puhlish an original illustration, showing to the eye at a glance the annual mileage of railroade huilt in this country, for the purpose of showing clearly, along with eome supplementary facts, the coming era of the Pacific cost is an Era of Railroads and city building separate and apart from San Francisco.

REVISITING BODIE.—Jos. Wasson, well known to the readers of this journal in connection with Bodie district during the past year, returne there for the purpose of remaining for two or three months to come. He expects to note developments even more thoroughly than hefore, aud furnish our readers with another series of letters. He is a hard worker—eees things for himself—and his ohservations concerning mining mattere are accordingly truetworthy. He is authorized to act as agent for the PRESS, to receive and receipt for subscriptions, etc.

A Curious Water Elevator and Air Compressor.

Mr. John Patten, of this city, has recently obtained through the MINING AND SCIENTIFIC PRESS Patent Agency a patent on a device for compressing air and raising water. The air is compressed by means of a descending column of water; the water is raised by the action of the air thus compressed. This is by no means a perpetual motion machine, although its working is quite peculiar. The apparatus is divided into sections of two different kinds, one for compressing air and the other for raising water. Several sections of both kinds can be connected together in a series of short, independent compressors and lifts, and put in the form of a siphon, in which case the water will be raised to any desired hight by discharging it a little lower than where it is first taken from, and employing more compression than lifting sections. In this case no water will be used but what is being raised by the apparatus. In localities where there is access of surface water, that can be used in connection with the water that is being raised, the outlet will not have to be below the level of the inlet. The variation will depend on the amount of water used, and how far it descends while being used in the apparatus.

For raising water out of rivers, etc., a certain amount of water will be raised a certain hight, by the descent of an equal amount of water through a greater distance than the ascending column is raised; or by the descending of a greater quantity through a less distance, and so on. No matter what form the apparatus is put in, the compressing sections will be put a certain distance apart, along the descending column of water; and the elevating sections will be put a little less apart, along the ascending column. At each compressing section the water displaces its equal bulk of air, which is conveyed in an air-pipe to the elevating sections, where the air displaces its equal volume of water; *i. e.*, raises it from one section to the section above. The compressed air can be used for running machinery instead of raising water, if desired.

The air compressor consists of two chambers setting side by side, which fill and empty with air and water alternately. They are connected with supply and discharge water pipes at the bottom, and atmospheric air and receiving air pipes at the top. There is a float in each chamber that regulates a set of automatic valves, situated at the bottom of the chambers, which allow one chamber to fill while the other is emptying, and as soon as one gets full and the other empty, they instantly reverse, causing the full one to empty and the empty one to fill, and *vice versa*. At the top of the chambers is a set of ingress and egress valves (check valves). While one chamber is emptying, an ingress valve opens, which allows the chamber to fill with atmospheric air. When the action is reversed, and the chamber begins to fill with water, the ingress valve closes and allows no air to escape into the atmosphere. When the air is compressed up to a pressure equal to the hight of the column of water that is filling the chamber, an egress valve opens which connects the receiving air-pipe with the chamber, and as the water fills the chamber the air is displaced and forced into the air pipe, in which it is conveyed to the elevating sections.

The elevating section consists of two chambers, setting side by side, connected with supply and discharge water pipes at the bottom, and supplying air pipe and the atmosphere at the top. There is a set of valves on top of the chambers, which alternately change the compressed air from one chamber to the other; while one chamber is connected with the atmosphere, the other is connected with the compressed air, and *vice versa*. There is a set of ingress and egress valves at the bottom of the chambers, the former connecting with the supply pipe and the latter with the discharge pipe. To illustrate the operation: Suppose one chamber to be filled with water and the other with air, the one that is filled with water to be connected with the compressed air and the other with the atmosphere; suppose the air to have a pressure of 50 pounds per square inch; this pressure on the surface of the water will force it downward through the egress valve, at the bottom, into the discharge pipe, in which it will be raised to a hight of 100 feet. While the air is thus forcing the water out of one chamber, the other will be filling from the supply pipe; as soon as one gets full and the other empty, the air valves instantly reverse, causing the same operation as just described. When the air has the above-mentioned pressure and the water is to be elevated to any very great hight, the elevating sections will occur once in every 100 feet; if the pressure is less, they will occur oftener, the discharge pipe of one, forming the supply pipe of the one just above it.

Persons desirous of obtaining further information on this subject, can address or call on the inventor, Mr. John Patten, 18 and 20 Fremont street, San Francisco.

THE Post Office department has redneed the prices of stamped envelopes on an average 20%, the effect of which has been to largely increase the requisitions for the same.

CORK refused to receive Gen. Grant.

Yokutsian Geology.

The legends of all nations are verbal classics which often contain the substance of close observation and intimate acquaintance with nature's phenomena. In the guise they are the aboriginal forms of science, without any separating line between the known and the unknown. The aboriginal, the infantile, and the uncultured mind alike find recourse and pleasure in a solution of fancy. Theory is interwoven with natual phenomena in a plausible way.

"Why the Sierra Novada is Larger than the Coast Range," on our inside pages, is an amusing example of the manner in which our California valley Indians have bridged, with this ancient and time-honored bridge of fancy, a gap like the Yosemito valley which they found between the known and the unknown. All the aboriginal nations have personified, in this manner, the mystery of the Great First Cause, and the origin of evil. Many of them deify the perfect man. For a people to have heroes and not to worship them, argues, indeed, a degree of stolidity and a lack of the capacity to appreciate adequately what is lofty and grand in character.

Many are the pretty conceits of the Greeks accounting for the origin of the earth, and the heavens, and the waters around and under the earth. They were the results of the observation and thoughtfulness of ancient philosophers intimate with nature. She led on to an abyss of darkness, and the poetic mind bridged it with a love story.

Until the geologists, or the poets of the day, give us a better reason for the dominance of the Sierra over the Coast mountains, the Yokutsian philosophy will hold.

AN Annual "Mining Summary" for the Pacific States and Territories, during the year 1878, will be published in the MINING PRESS shortly. There are not many persons in a position to realize what progress is really made in this vast region.

BY the time the Oriental mill, recently purchased by the Deadwood mining company, of Nevada county, is ready to commence work, the lessees will have a crushing of from 125 to 150 tons ready, which, judging from past yields, should go as high as $40 per ton.

JUAN MONCASI would-be assassin of the Spanish king, has been executed.

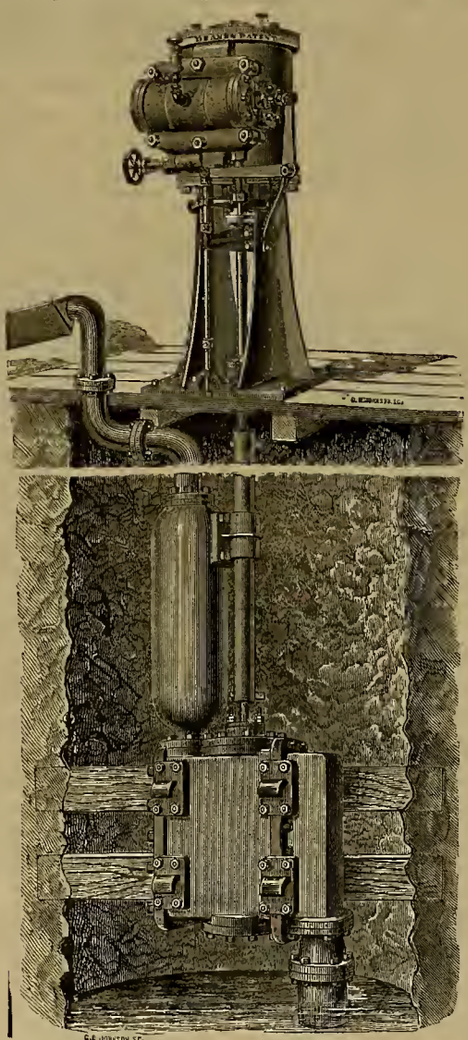
An Improved Vertical Mining Pump.

Among the great variety of Deans's patent steam pumping machinery for mining and other puposes, kept in stock by Messrs. Parke & Lacy, agents for mining machinery, No. 417 Market street, in this city, is the vertical mining engine and pump, shown in the accompanying engraving. This machine is unequaled for many situations where water is to be taken from deep wells or from contracted shafts.

The engine is usually placed over the mouth of the well or shaft, where it can be conveniently oiled and tended, and is connected with the pump at the bottom by a properly guided rod. But one pipe is necessary in the shaft—that for discharging water.

By a patented arrangement, the up stroke and down stroke, through the whole length, can be regulated with valves, which control the motion of the steam piston, but *not* by simply closing the ports, and compelling the engine to work against back pressure.

These machines are made with any diameter of cylinders, from the smallest to the largest, and with any desired length of stroke. The water valves and passages are easily accessible. These pumps work well when submerged. The engraving represents this double acting vertical pump and engine, 16-inch steam cylinder, 10-inch water cylinder, and 24-inch stroke. A great variety of these steam pumps are made, which we shall take occasion to illustrate from time to time. Any order can be filled by Parke & Lacy at short notice.



DEANE'S DOUBLE ACTING VERTICAL MINING PUMP AND ENGINE.

METEOROLOGICAL SUMMARY FOR DECEMBER.—The report of the U. S. Signal Service officer, of San Francisco, for the month of December, is summarized as follows: The mean hight of barometer for the month was 30.118; mean temperature, 51.6°; mean humidity, 59.4; prevailing winds, north; highest barometer, 30.477; lowest, 29.723; highest temperature, 68°; lowest, 40°; monthly range, 28°; greatest velocity of wind, 40 miles per hour; total number of miles traveled by wind, 5,529; total rainfall, .58 inches. Rainfall in December during former years: 1871, 14.36 inches; 1872, 5.95 inches; 1873, 4.72 inches; 1874, .33 inches; 1875, 4.15 inches; 1876, .00 inches; 1877, 2.66.

THE New York *Sun* speaks of the Sandwich Islands as having leaped, in the last half century, from barbarism to civilization. Queen Emma presents a greater advance over Kamehameha II. than Queen Victoria over William the Conquerer.

Academy of Sciences.

On the 6th inst. the annual election of the officers of the Academy took place. There was but one ticket in the field. All the old officers were re-elected, with the exception of Corresponding Secretary, in which position S. B. Christy succeeds A. B. Stout. The officers are: President, George Davidson; First Vice-President, H. W. Harkness; Second Vice-President, Henry C. Hyde; Recording Secretary, Charles G. Yale; Corresponding Secretary, S. B. Christy; Treasurer, Elisha Brooks; Librarian, Chas. Troyer; Director of Museum, W. G. W. Harford. Trustees—Wm. Ashburner, R. E. C. Stearns, Ralph C. Harrison, Geo. E. Gray, Thomas P. Madden, John F. Miller, B. B. Redding.

In the evening the annual meeting was held. It was well attended. The President, George Davidson, occupied the chair.

Mr. Ashburner chairman of the Board of Trustees, submitted a report, in which, after reviewing the sources of the finances and some other things, he took up the subject of

The James Lick Trust,

And said: "In March last the Judge of the Nineteenth District Court rendered a decision against the Academy in the suit pending against the Lick Trustees. An appeal has been taken in the Supreme Court, and the case is now set for hearing on the 16th inst., and so I confidently expect a speedy settlement of this question. A great deal of obloquy has been heaped upon your Board for the position it has taken in this matter, and the Trustees have been accused of throwing impediments in the way of an execution of an important trust, in which all the people of the State, and perhaps the world, are greatly interested. I trust you will all believe me when I assure you that this Board, under the guidance of its late President, has never been actuated by a spirit of captious opposition, but has always been united as one man in what we considered due to the Academy and ourselves as Trustees of its property. When the suggestion of a compromise was first made, we immediately recognized the propriety of such a step, and assisted in its being carried out, so far as lay in our power. But we did not consider it consistent with our duties as Trustees to relinquish on behalf of the Academy of Sciences a contingent interest in a property which we all hope will one day prove very valuable, without being authorized to do so by the Courts. The question at issue, therefore, is not whether a compromise shall be made, for this has already been asseuted to, but whether the money to effect this shall be paid out of the residuum of the estate after paying all other bequests, and in which the Academy jointly with the Society of Pioneers is interested, or by a pro rata upon the beneficiaries."

The Finances.

The Secretary reported as follows: Receipts for the year, $8,668.35; disbursements up to December 31st, $7,171.73; balance on hand, $1,496.62, with two or three bills unpaid. However, since the opening of the year, the society has been compelled to borrow money for several purposes, especially to square up a very heavy tax bill; so that the society is really in debt $3,027.

The President's Report.

President George Davidson, spoke of the effect of the hard times on the finances of the society. Notwithstanding, the ardor of the members had in no degree cooled. He referred with pleasure to the spirit of unanimity that had prevailed in all departments during the year. He hailed with satisfaction the advent of many new and energetic members. He spoke favorably of the action of the trustees in relation to the Lick Trust. All were waiting quietly for the legal settlement of the questions at issue; and meanwhile did not come before the public in discussions that could be of no avail. He spoke most feelingly of the late D. D. Colton, whose energy, sagacity and generosity, he so well knew from contact with him in the affairs of the society. Like reference was made to the late William Rulofson.

B. B. Redding presented an interesting paper on the "Foothills of the Sierra Nevada," which we shall publish next week.

Dr. Herman Baer was elected a life member as a recognition of his valuable services to the Academy.

A vote of thanks was given to the Secretary, Charles G. Yale, who has for several years faithfully performed the duties appertaining to that office, as well as those of Secretary of the Trustees and Council, without any compensation. S. R. Throckmorton, Edward Bosqui and Louis Sloss, were appointed a committee to audit the accounts of the society.

DR. HOLDSWORTH has rich claims at Milton on the ridge 17 miles east of Forest City, and seven miles south of the Buttes and on the boundary lines of Nevada and Sierra counties. He has gravel claims and rock bearing gold, silver, and copper. The description of the claims in the Nevada City *Transcript* makes the Doctor look like a veritable Crœsus.

DURING the past six years the Bald Mountain Company, Sierra county, has paid dividends to the amount of $664,000, which is $110,666 per year. Gold to the amount of $1,300,000 has been taken from the mine in that time.

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PATENTS obtained promptly; Caveats filed expeditionsly; Patent Reissues taken out Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported hy Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Agency Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our schedule price for obtaining foreign patents, in all cases, will always he as low, and in some instances lower, than those of any other responsible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than any other agents.

The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of inventions discovered here than any other agents.

Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for pateuts can rest assured that their communications and business transactions will be held strictly confidential hy us. Circnlars free.

Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered hy a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, hut their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

Engravings.

We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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Having complete arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing an establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be atteuded to personally hy a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirons of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in case of necessity secure the services of our home and Washington branch agency.

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Solicitors of Patents for Lands, Mines and Inventions, MINING AND SCIENTIFIC PRESS OFFICE, No 202 Sansome St., San Francisco

Contents of Pamphlet on Public Lands of California, U. S. Land Laws, Map of California and Nevada, Etc.

Map of California and Nevada.—The Public Lands; The Land Districts; Table of Rainfall in California; Counties and Their Products; Statistics of the State at Large.

Instructions of the U. S. Land Commissioners.—Different Classes of Public Lands; How Lands may be Acquired; Fees of Land Office at Location; Agricultural College Scrip; Pre-emptions; Extending the Homestead Privilege; But One Homestead Allowed; Proof of Actual Settlement Necessary; Adjoining Farm Homesteads; Lands for Soldiers and Sailors; Lands for Indians; Fees of Land Office and Commissions; Laws to Promote Timber Culture; Concerning Appeals; Returns of the Register and Receiver; Concerning Mining Claims; Second Pre-emption Benefit.

Abstract from the U. S. Statutes.—The Law Concerning Pre-emption; Concerning Homesteads; Amendatory Act Concerning Timber; Miscellaneous Provisions; Additional Surveys; Land for Pre-emption; List of California Post Offices. Price, post paid, 50 cts.

Published and sold by DEWEY & CO., S. F.

Take the Paper that stands by your Interests.

DEFLECTORS,

Or Perkins vs. Hoskin.

H. C. PERKINS has for nearly two years been threatening orally and through the Press to prosecute all persons using my Patent Deflecting Nozzle, but for *good reasons*, has failed to come to time. I want miners to understand that Deflectors are still manufactured and sold, and that I will defend all suits and assume all responsibility. Mr. P. will confer a favor if he will carry out his threat, as it will afford me the opportunity I desire to again try the case, and he can rest assured that *professional dodges* will not again be allowed to *temporarily* thwart the ends of justice.

I feel confident that the Supreme Court of the United States will ultimately decide in my favor. The superiority of my invention is shown by the means which Mr. P has resorted to in trying to stop my sales. Mr. P. has so degraded himself as to circulate statements which he knows to be *false and malicious*. Notwithstanding the great number of my Deflectors in use, I have heard of but one accident, and this was caused by the breaking of the iron lever from a defect in the material and great carelessness in use. This circumstance Mr. P. has magnified into several deaths and numerous accidents. I refer to the following owners and Managers for testimonials as to safety and efficiency. Some of them have used and discarded Mr. Perkins' device in favor of my much superior one. Messrs. Gould, Gold Run, using 4; Spaulding, Dutch Flat, on different mines, 12; Stone, Gold Run, 2; Morgan, Little York, 6. Bisbee, Iowa Hill, 2; Briere & Wheeler, Bath, 2; McGillivry, Forest Hill, 4; Atkins, Weaverville, 2. I could mention scores of others, but these are sufficient.

Mr. Perkins' device is an infringement on a patent owned by Mr. Craig, who is about to institute legal proceedings to protect his rights. Miners are advised to stand from under. A word to the wise is sufficient. R. HOSKIN,

Manufacturer of Machines for Hydraulic Mining. Address, No. 29 Garden Street, San Francisco, or Empire Foundry, Marysville, Cal.

CAUTION

To Hydraulic Miners.

The public generally and Hydraulic Miners especially are hereby notified that any parties making or using the contrivance known as the HOSKIN DEFLECTOR will be prosecuted to the full extent of the law, said machine having been declared by the U. S. Circuit Court an infringement upon my patent, the

Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

HENRY C. PERKINS,

North Bloomfield, Nevada Co., Cal., October 1st, 1878.

South Pacific Coast Railroad.

New Route (Narrow-Gauge.)

Commencing Monday, September 30th, 1878, boats and trains will leave San Francisco daily from the New Ferry Landing, foot of Market street, at 8:30 A. M., 9:30 A. M., and 4:00 P. M. for ALAMEDA, SAN JOSE, LOS GATOS, ALMA, and all way stations.

Stages connect with 9:00 A. M. train at Alma for Santa Cruz.

EXCURSION TICKETS will be sold Saturday afternoons and Sunday mornings from San Francisco and Alameda to San Jose, Los Gatos, and Congress Springs, and return, at reduced rates, good only until Monday evening following date of purchase.

FERRIES AND LOCAL TRAINS, DAILY.

From San Francisco.—5:30, †6:40, 9:00, 10:30 A. M.; 1:30, 4:00, 5:15, 6:30 P. M.

From High Street, Alameda.—†5:40, 7:40, 9:04 A. M.; 12 M.; 2:40, 4:00, 5:16, 6:24 P. M.

†Daily, Sunday excepted.

The Company are prepared to carry vehicles of all kinds on the Ferry, to and from San Francisco, Alameda and Oakland.

THOS CARTER, Superintendent GEO. H. WAGGONER, Gen'l Passenger Agent

PROMPT AND SUCCESSFUL.—*Messrs. Dewey & Co:*—Gentlemen: Your Circular letter, 12th inst., informing me of successful termination of my application for patent received. Please accept thanks for the prompt and successful manner in which you have managed this business Yours respectfully, J. H. CAVANAUGH.

Walla Walla, Dec. 24th.

Engraving done at this office.

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San Lorenzo, December 6th, 1877.

Messrs. Dewey & Co.—*Gentlemen:* I received the Letters Patent for my invention on the 5th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully, Wm. Dals.

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This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

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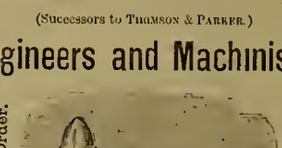

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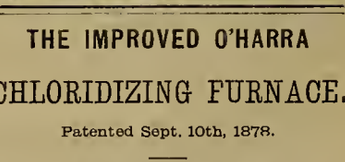

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Two men and two cords of wood roast

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President, I. F. MILLER. Secretary, O. D. SQUIRE.

Incorporated November 16th, 1878.

Office, Room 28, Stevenson's Building, S. F.

Continued from page 21.

pletion. Repairing and retimbering and enlarging ths main south drift on the 1700 level is making the best of progress. Work is being pushed with great energy at all points.

SAVAGE.—The joint Hale & Norcross east drift, on the 2000 level, will complete a connection with the Chollar-Combination shaft in two or three days more.

SOLID SILVER.—The drift west from the winze below the main tunnel or adit level has cut through the east clay of the west ledge, and owing to a heavy seepage of watsr being sncountered, indicating that a strong flow of water might be tapped, it was deemed advisable to suspend further advancement in that direction until better prenarations cau he made for raising the water and sending it out through the tunnel.

MORNING STAR.—The winze below the level of the south drift from the old tunnel is following down the east slope of the ore vein and is now down 44 ft. For several fest the winze has been cutting a fine character of quartz, carrying bunches and spots of rich ore.

SUTRO TUNNEL.—Total length of the south lateral branch, 1186 ft. Only about 200 ft. further will carry it through to the Julia shaft. The ledge formation passed through of late has been of the most favorahle working character, allowing advancement at the rate of about 100 ft. psr week.

BULLION.—The north drift on the 2400 level of the Imperial, which was re-started 80 ft. back from the facs last week, is now steadily advancing in the west country rock on the west side of the vein, the face heing perfectly dry.

NORTH CON. VIRGINIA.—The foundations for the new machinery ars all completed. The railroad track is also completed so that the new machinery can be unloaded as to need no second shipping or handling.

UTAH.—The surface improvements are making good progress. Sinking the main incline below the 1350 level is making the best of headway, the bottom in good blasting ground.

WARD.—The stone foundations are about completed ready for the reception of the new hoisting engines.

YELLOW JACKET.—The new shaft to-day is down 2129 ft.; ground, hard blasting ledge porphyry, but working well, allowing of very good progress being made iu sinking.

UNION CON.—The repairs to the main north drift from the Ophir on the 1600 level are completed.

HALE & NORCROSS.—The progress on the lightning drift on the 2000 level was very materially interfered witb hy the rise of water during the first part of the week, occasioned by the breakage and stoppage of the Savage pumps. The water has, however, been drained.

BEST & BELCHER.—The pumps are kept running to their full capacity at the new shaft, aud the flow of water is yet so steady and strong that but slow progress can be made with the sinking.

MEXICAN.—The main north drift on the 2000 level is making steady progress, the face in somewhat softer ground. During the first part of the week strong indications of water were encountered in the face, and drill holes have been driven ahead to prevent the flooding of the mine should a large body be struck.

GOULD & CURRY.—Sinking the nsw shaft has been very much impeded hy a strong flow of water, which keeps the donkey pumps runniug to their full capacity.

CHOLLAR-COMBINATION SHAFT.—Laying the foundations for the new air compressor is making good progress. The flow of water is still quite strong, amounting to about 80,000 gallons per day.

TROJAN.—The ore stopes recently opened at the top of the upraise on the second station level are opening out finely, the ore being of a good milling quality.

BELCHER.—The south drift on the 2360 level is steadily advaucing, with very favorable prospects. Opening the new station at the 2560 level is making good progress. As soon as the station aud ore chutes are completed, prospecting drifts will be started on that level and sinking the main incline will be resumed.

SILVER HILL.—The east drift on the 1100 level is now in 60 ft., the face in soft vein matter, streaked with good quartz, carrying strong indication of good ore when the maiu ledge is reached.

OVERMAN—Sinking the new shaft is making the best of progress. Sinking the vertical winze bclow the 1600 level is also making good headway; it is now down 18 ft.

CON. IMPERIAL.—The east crosscut from the joiut Alpha winze on the 2400 level is making good headway, the face in vein material.

TEM PAHUTE DISTRICT.

MR. YOUNG informs the Tybo *Sun* that the outlook is especially bright. The Wyandotte is pushing work rapidly in all their mines, uuder the supervision of Mr. G. C. Rohhins of Eureka. A large amount of very high-grade ore has been extracted, and is now lying on the dump. There is ore enough in sight, in the company's mines, to run a 20-stamp mill for a year, and he thinks a mill will shortly he erected to reduce it. About 40 men are in the employ of the company, under the foremanship of Mr. John Killen. George Russell has gone to Philadelphia to uegotiate the sale of some of the mines owned by David Service aud bimself.

LODI DISTRICT.

LODI.—Grantsville *Sun*, Dec. 28: The Lodi mine is situated in Lodi district, about 27 miles from Grantsville. It is owned by J. E. Holman & Co. The company have sunk three shafts on their ledgs, 140, 65 and 45 feet in depth, respectively, all in good ore. They have from 180 to 190 tons of ore on the dump, and can take out from 10 to 15 tons daily, or, in other words, could keep a good sized furnace running. This is ons of the first mines located in the district.

ARIZONA.

TIPTOP.—Arizona *Miner*, Jan. 3: The Tiptop mine, as work progresses, continues to widen and satisfy every person familiar with its history that it is a genuine fissure vein, and will run down even to the very roots of the gigantic mountains in which it is situated. The company's mill keeps steadily at work on ore from the mine, and is turning out on an average $45,000 per month. In fact, all the mine owners in the district who are working their various claims are more than satisfied with their prospects, and entertain none but the most sanguine expectations for the future of their bonanzas.

CROSSCUT.—Jake Marks returned yesterday from Humhug district, where he has a gang of men drifting on the Crosscut mine, on the 100 level, each way from the shaft, along the ledge, which is from six to twelve feet wide. One drift is in about 30 feet, and the other 20. The pay streak at the end of the 30-foot drift is eight feet wide, four feet of which assays $200 to the ton.

BRADSHAW.—C. A. Luke retnrned from a trip to the various mines of Bradshaw yesterday. The Basin mill was ready to run on Gray Eagle ore, but was delayed on account of the pack-train being unahle to deliver the ore on account of deep snow. At the Tiger work is progressing rapidly; the prospect shaft, which is to be sunk 1,000 feet, is going down as fast as the skill and energy of man can devise. At the Oro Bonito everything is fast heing put in shape to commence operations, the new mill heing completed. A great many men are at work on the various ledges, taking out ore and making valuable improvements. Mr. Luke thinks the snow in the mountains averages 16 iuches, although at some places he found it over two feet.

BULLION.—Beach's team loaded to-day at Wells, Fargo & Co.'s office, 7,500 pounds of bullion, recently taken out at the Agua Fria smelter, from Silver Belt ore. The bullion goes to Ehrenberg per team and thence per steamer and rail to San Francisco.

ACCIDENTAL.—The uew shaft on the Accidsntal mine, Lynx creek, is down 25 feet, and a good vein of very rich ore has been found. The arastras are about to start up and reduce the fine ore now being extracted from the mine.

New Incorporations.

FRESNO M. Co.—Intention: To operate in California. Capital, $5,000,000. Directors—H. T. Fairbanks, Oliver Merrill, W. A. Roberts, W. F. Meyers and Isaac Overton.

BLUNDER G. & S. M. Co.—Location: Nevada. Capital, $10,000,000. Directors—R. P. Johnson, George L. Tucker, W. C. Walker, T. A. Talhert aad C. S. Drew.

BALBACH SMELTING AND REFINING CO.—Intention: To operate in any of the States or Territories. Capital, $100,000. Directors—Leopold Balbach, C. F. Kirchner, C. L. Weller, A. J. Bryant, O. A. Chase, J. P. Allen and J. B. Crockett, Jr.

CALIFORNIA RAMIE MACHINE CO.—Object: To manufacture, sell and erect machinery and works for the extraction of fiher from ramie and hemp. Capital stock, $500,000. Directors—Thomas Trefall, Hugh C. Hinman, E. J. Barry, John J. French and Andrew Vance.

SANTA ROSA G., S. & C. M. Co.—Intention: To operate in the Trinidad district, Lower California. Capital, $10,000,000. Trustees—W. B. Stanly, C. H. Bumpus, A. S. Long, C. W. Frost and H. W. Fortune.

VULCAN M. & M. Co.—Capital, $6,000,000. Directors—Charles Holmes, W. H. Smith, G. W. Fisher, Charles W. Fox and Alexander Brown.

WESTERN ELECTRIC LIGHT CO.—Capital, $5,000,000. Managers—M. S. Latham, J. W. Coleman, George Ladd, J. M. Livingstone, S. Steinhart, E. F. Hall and Thomas Bell.

JENNIE JUNE M. Co.—Intention: To operate in Shasta county. Capital, $5,000,000. Directors—H. C. McClure, Alvin Potter, E. C. Locke, F. N. Delaney and F. H. McCormick.

A NEW INDUSTRY.—A company has just been organized in this city for the manufacture and sale of Boswell's fruit drier, cooking and heating apparatus, with an authorized capital of $100,000, about one-third of which, we understand, has been already subscribed. The office of the company is located in Sherman's building, corner Clay and Montgomery streets, where samples of the driers can be seen, and any information relative to the operation of the company may be obtained. Mr. Eugene L. Sullivan, an old and well-known citizen of the State, is at the head of the company, and S. R. Lippincott, Esq., formerly an extensive manufacturer in the Eastern States, is the Secretary.

WE call attention of parties interested to the advertisement in another column, of the Frue concentrator.

STRIKES among English coachmen and shipwrights are reported.

A Kingdom for a Process.

In our last issue we gavs some account of the work done, and the results arrived at in the Excelsior and Enterprise mines at Meadow Lake. We taks first to-day, the

Mohawk and Montreal.

This mine was one of the very few that offered sufficient hopes to the owners to lead them to continue work, even through several severe winters. A shaft was sunk to a depth of 220 feet or more, and a tunnel run to meet it, so that the ore was carried to the mill on cars. Assays made at different times on ore from different parts of the works were as follows: $65 gold; $159.23 gold; $2.83 silver; $176.80 gold; $682 gold. How imperfectly the ore was worked may be judged from the results of a few runs. In August, 1866, 29 tons worked hy Winton's mill yielded something over $800, or $27 per ton; this, however, without the sulphurets, which were estimated at about $35 per ton. In September of the same year, 48 tons yielded $2,233.02, or $46 per ton; $600 of which came from the sulphurets. In November, 28 tons, chlorinized, yielded $677.40, or $24 per ton. In December, 163 tons gave an average yield of $29 per ton. For 1867 we have account of the working of 54 tons (less the sulphurets), which yielded 65.50 ounces of amalgam, containing $1,082.56 gold, and $16.93 silver; total, $1,099, or $20 per ton. In October, 1868, the Mohawk and Montreal mill (the company built two mills, a five-stamp and a ten-stamp—probably the latter is referred to here) crushed 100 tons in seven days and 20 hours. The yield from this was $3,524.49, or $35 per ton. At this time it is said, over 1,000 tons of similar ore was in sight in the mine.

This is sufficient to demonstrate the imperfections of the processes used. The mine seemed to improve as depth was attained, the highest assays given above being from ore taken out at considerable depth. As stated above, two mills were built. There were also erected roasting furnaces, some, we helieve, at the early stage in the development of the mine, and three more as late as 1869. These latter were large enough for a charge of from 20 to 25 tons, and wers erected, it seems, in order to try the

Burns Process,

Or a modification of the same. In this process the ore was first roasted, and then plunged into a chemical bath (composition not stated) until coolsd. The ore was then ready for amalgamation. It was thought that this process would cost about $8 per ton. About ths same time another process, Hartley's, appeared, which was, no doubt, merely a slight modification of the Burns, but which claimed to be much cheapsr. Both have been consigned to the tomh so far as Meadow Lake is concerned. Both aimed hy use of chemicals to prepare the gold for amalgamation.

The history of this mine is then, in brief, as follows: Large quantities of ors assaying from $65 to $700 per ton, yielding on an average $30 or less per ton.

The Green Emigrant.

This mine was a comparatively late discovery, and was thought one of the richest in the district. The assays reached to $1,000 per ton. Above the ore was noticeably free from base material. The ledge was from five to eight feet wide, and was worked to a depth of 65 feet, perhaps deeper. The ore improved with increase of depth. A run of 50 tons from a depth of about ten feet yielded at the rate of $26 psr ton. At this depth the foot wall was covered with a thin black layer rich in copper and gold. The rest of the ledge was white quartz, heavily laden with sulphurets and free gold. Mint returns from a run on Green Emigrant ore showed the yield to be about $27 per ton; 891 fine. A run of 120 tons yielded at the rate of $23 per ton. Other runs reached as high as $30 per ton.

The U. S. Grant.

This was another of the richest mines, one of those few on which work was continued through the winters. The mine was six miles south of the town of Meadow Lake. The company owned a mill, which we find stated as having five stamps of 500 pounds each. The ledgs was 5½ feet wide, and was worked to a depth of at least 100 feet. At the beginning of 1867 the U. S. Grant was considered the most successful of the Meadow Lake mines. Up to January 7th, 1867, the mill had crushed 271 tons of ore, the gross yield of which is stated at $13,398.57, or about $50 per ton. The cost of mining and hauling the ore is put down at $5.50 per ton; of crushing, $3.50 per ton; leaving, it is added, a nice little profit of $40 per ton(?) At some runs, the average yield was from $12 to $30 per ton. However, in other cases, if we can depend on the figures before us, they ran as high as $110 per ton. We have no facts regarding the later history of this mine. We would like to have a fuller account from some of our readers.

Besides these mines that we have mentioned, there were numberless others that were noticed from time to time in the Meadow Lake *Sun*. Considerable work was done upon many of them, in sinking shafts or inclines. Copper veins were found and a company styled the Peacock Copper, Nickel & Cobalt Company was formed, with a capital of $675,000.

Bullion Shipments

Were for a time reported quite regularly. For August, 1866, they were as follows (how complete the reports are we do not know): Mountain Chief, $188; Mohawk & Montreal, $833.60; U. S. Grant, $1,559.40 (?); Gold Run Phœnix, $698; total, $3,279. September shipments (1866): Knickerbocker, $34.10; Mohawk & Montreal, $2,604.66; Enterprise, $1,210; Alhambra, $260; Moscow, $82; Western Company, $76.37; total, $4,367.13. For October, 1866, the shipments were: U. S. Grant, $4,750; Mohawk & Montreal, $1,294; Enterprise, Wisconsin, Gold Run, Eclipss and Empire, together, $630; total; $6,674.

The Processes Tried.

Somewhere in the district an arastra was rigged. The ordinary mill process we have seen utterly failed. The chlorination and superheated steam process had each a trial. Then came the Burns process, which we have described as far as possible. This processs, it was said, obtained from two tons of Wisconsin ore, which otherwise would yield nothing, three and one-fourth ounces, .917 fine, at a cost of $8 per ton. In connection with this process we find the names of Eagleson & Co., Hartley and James Doling. The last-named gentleman asserted that by his method he had taken from the ore never less than $8 per ton, and had obtained as much as $36 per ton; cost of process, $8 per ton. Matman, of Nevada City, we believe tried his hand at the ores. A man named Crail had a plan for working them. The Fryer process was applied. Another (Gleann's) process is described as follows: The ore is first dumped upon a drying hearth or put through a calcining furnace; thence to batteries or pulverizers. The pulp is then put into an oxidizing furnace. From the oxidizing furnace it is raked into an alkaline bath in vats. From ths vats it goes to amalgamators and pulverizers. Mr. G. introduces a compound of his own to bring about amalgamation. He works ore up to 80% of assay, at a cost of $6.64 per ton. This method was talked of as late as November, 1877. We may have made soms errors in names; if so, ws hope we will he corrected.

In ths present year, Willard's furnace, with which many of our readers are doubtless familiar, has been trisd. We have seen it stated somewhere that Willard's furnace, in combination with Gleason's amalgamation, succeeds in saviug 92% of the assay value. Elsewhere we find the following description of the "new process:" "The pulverizing process takes the place of stamps in a stamp mill, and will reduce a ton of ore in one hour to the consistancy of flour. The pulverized ore is then placed in the furnace and is mixed freely with saw dust. The powdered rock becomes intensely heated hy means of ths fires below, the strong air currents and the burning saw dust. All the sulphur, arsenic, antimony and refractory elements are consumed and drivsn away, and when the furnace cools off ths purs gold remains. The gold is so fine and flourery that wet amalgamation cannot be employed. The gold floats away and is lost. The Secor process of dry amalgamation, howsver, gives perfect success." In connection with this description it is announced (on what authority we do not know) that "Mr. Frank Pauson will put up a $50,000 mill at Carlysle early next spring, with four furnaces and two amalgamators."

Bullion Shipments.

Since our last issus shipments of bullion have been as follows:

Northern Belle, Dec., 28th, $4,463.22; Grand Prize, Dec. 30th, $24,000; Leeds, Dec. 24th, $3,662.12; Tybo, Dec, 25th, $3,047.31; Hillside, Dec. 31st, $5,119; Jefferson, Dec. 30th, $1,753.84; Indian Quesn, Dec. 23d, $3,497.17; Alexander, Jan. 3d, $7,811.51; Star, December, $35,743; Oriental Con., December, $9,075; Highbridge, Jan. 3d, $8,546.48; Pioche, for week ending Dec. 28th, $3,545; Manhattan, Jan. 6th, $11,202.16; Con. Virginia, Jan. 4th, $84,865.18; California, Jan. 4th, $143,078.97; Standard, Jan. 1st, $16,962.18; Bodie, Jan. 1st, $12,347.54; Northern Belle, Jan. 1st, $3,008.75; Hillside, Jan. 4th, $5,350; Martin White, Dec. 31st, $5,776.63; Black Jack, Dec. 30th, $7,700; 2d, $5,035; Tybo Con., Dec. 30th, $8,062.

Shipments for week ending Jan. 4th at Salt Lake were $43,369.

Shipments for week ending Dec. 28th, from Silver City, Idaho, were $18,000.

The Silver Reef *Miner* thinks the January shipments from that camp amounted to $125,000.

The Bodie shipments for Decemher were $180,206, of which $102,070 were from the Standard mine, and the halance from the Bodie.

MAKING ARTIFICIAL FELDSPAR CRYSTALS.—Messrs. Foque and Levy, in a communication to the French Academy of Sciences, state that they have been successful in making feldspar crystals artificially—the varieties crystallized being obligoclase, labrador and albite. The process consists in fusing the feldspar in a platinum crucible placed in a Schlœsing furnace, then placing the bntton before a Bunsen hurner, which keeps it for eight hours at a temperature slightly below that of fusion. Under the influence of that sort of annealing the vitreous mass changes in structure and crystallizes with all the details of form of natural minerals.

IN a trial of the electric light in Philadelphia, 24 Brush lights did the work of 2,400 gas jets.

BROOKLYN'S debt has increased $1,235,566 during the year.

News in Brief.

JUSTICE MCKEAN, of Utah, is dead.

SULLER BROS., tobacconists, have failed.

FLOODS are doiug much damage in Frsnce.

STRONG gales and heavy seas, on the Atlantic.

SENATOR SARGENT is steadily improving in health.

THE Nevada Legislatnre met on Jan. 6th, at Carson.

THERE is a great stampede to Leadville, Colorado.

THE Freuch elections resulted in a Republican victory.

A GOLD mine has been discovered in east Tennessee.

A PLAGUE has appeared among Cossacks of Astrachan.

DISTRESS among English poor seems to bo on the increase.

BISMARCK will use his iufluenco in favor of protectiou.

RAILROAD accident in New York; two locomotives exploded.

ALONZO GARCELLON elected Governor by the Maine Legislatnre.

THE gay season of visiting and entertainmcuts at Washington has begun.

ADMIRAL TOSCHARD, a member of the French chamber of Deputies, is dead.

RIOTS are threatened in Constantinople, owing to the high price of provisions.

JUDGE JAMES B. MCKEAN, ex-Chiof Justice of Utah, diod at Salt Lake Monday.

THE scarlet fever epidemic still rages in New York city, and diphtheria is increasing.

RESUMPTION has had a tendency to increase largely the subscriptions to the 4% loan

THE Atchison, Topeka and Santa Fe Railroad Company have purchased the Denver and South Park railroad.

LARD is being shipped in largo qnantitios from Chicago to San Francisoo, via New York and Cape Horn.

FRANCE, watching Bismarck and Austria, has given one year's notice of the termination of all treatiss of commeree.

SEVEN commercial hanks of San Francisco, have refused to submit to inspection by the Bank Commissioners.

A COLLISION occurred on tho Michigan Central railroad Jan. 3d, near Kalamazoo, injuring a number of persons.

SEVENTY-FOUR Communists in New Caledonia have heen pardonod because of their services against the insurgents.

THE Japanese government have agreed to grant a loau of $1,500,000 for the purpose of working the coal fields.

A LARGE pot of Spanish silver dollars, a number of them hearing date of 1743, has been unearthed on Staten island.

THE Irish executive is seriously considering the question of the release of O'Kelly, the only remaining Fenian prisoner.

NATURALIZATION papers have been refused to a Chinaman by the Clerk of the United States Circuit Court at New York.

VIRGINIA realized $110,000 last year from the operations of the Moffit liquor law in excess of the receipts from the old system.

DURING 1878 there were 34,400 through emigrants for California over the Union Pacific railroad; in 1875 there were 53,400.

THE number of miles of railroad constructed in the United States during 1878 was 2,688, exceeding any previous year since 1873.

LIGNITE and asphaltum are said to he so abundant between Jeffa and the Dead sea, that the Holy Land may supply Egypt and Syria with fuel.

THE profits accruing to the Government from the coinage of standard silver dollars for the three weeks ending January 4th, amounted to $575,000.

THE Harmony cotton mills, of Cohoes, New York, have reduced working time to three days a week, in order to reduce production and stiffen prices.

IT is officially aunonnced that the Madrid government will in March next, contract for 1,500,000 kilogrammes of Virginia and Kentucky tobacco.

TWENTY-ACRE farms are said to he offered to workmen, along the line of a projected railway in New Mexico, with cattle and farming implements, for $200.

IT is said that since the year 1835, the forest area of the Western Hemisphere has decreased at the average yearly rate of 7,600,000 aores, or about 11,400 square miles.

WORD is received from the Superintendent of the Los Angeles Oil Company's well in the Sespe district, that a flow of 100 harrels per day has been struck.

CATTLE and hogs are dying at a fearful rate in Iowa, the former from smut in the cornstalks, and the latter from cholera. Hundreds of farmers have lost every hog they possessed.

SAN DIEGO county, during the year 1878, exported 1,490,240 pounds of honey; honey in comh, 954,480 pounds net; honey strained, 535,860 pounds net, and 24,440 pounds of heeswax.

THE amount of gold paid out at the sub-Treasury, in New York, January 3d, for legal tender notes, was $80,000, and the amount of gold taken in for legal tender notes was $200,000—a net gain to the Treasury of $120,000 in gold.

THE first hank in southern Arizona hegan operations in Tucson on January 1st, under the name of the Bank of Pima County. The officers are P. W. Smith, President, and L. M. Jacobs, Cashier. The capital stock of the corporation is $100,000, with $50,000 paid in.

ICE formed at Jacksonville, Fla., last Saturday night, for the first timo in 30 years.

Two hrakemen frozen to death on the Central New Jersey and North Pennsylvania roads.

A THROUGH passonger train for Chicago—the first sinco the 2nd inst—left Buffalo on Jan. 7th.

AUSTRIA has lately bought £60,000 worth of bar silver, landed in London by a Chile packet.

THE Rosebury *Independent* tells of a meteor which lately struck and set fire to a hay stack.

THE Honore block, one of the finest edifices in Chicago, was destroyed by fire Saturday last.

CHARLES FRANCIS ADAMS has resigned as Governmont Director of the Union Pacific railroad.

WRIGHT & KING, Chicago representatives of the Eagle Paper Works, New York, have failed.

OUTDOOR labor is interrupted in Scotland hy the iutense cold, and a railway blockado is feared.

NAVIGATION has heen suspendod on account of ice in the Columbia and Willametto rivers, Oregon.

THE strength of the native army of India is about 125,000. It will soon be increased to 140,000.

THE certificate of Captain Howard, of the wrecked steamship *Georgia*, has been suspended for two years.

EASTERN banks seem to he taking in more coin than they are payiug out. So far, so good, for rosumption.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and tbe cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending tbeir influence and encouraging favors. We inteod to send oone but wortby men.

J. L. TUARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
C. N. WEST—Santa Cruz, Monterey and San Benito counties.
A. C. CHAMPION—Tulare, Fresno and Inyo counties.
W. D. WHITE—San Bernardino county.
J. W. A. WRIGHT.—Tulare, Fresno and Kern counties.
E. M. DENNY.—Oregon.
H. E. HALLETT.—Stanislaus county.
G. W. MCGREW.—Santa Clara county.
RICHARD ALLEN.—British Columbia.
R. D. NUNNALLY.—Siskiyou County, Cal.
DR. W. G. ALBAN.—State of Nevada.
EDWARD DUGAN.—Washington Territory.
MRS. CARRIE F. YOUNG.—Nevada and Sierra counties.
A. LOOMIS.—Sonoma County.
L. L. ALEXANDER.—Alameda County.
J. T. JACKSON.—Alameda and Cootra Costa counties.
JOHN MICHELS.—New York and adjoining cities.
M. D. SNRAOER —Alameda Couoty, Cal.
JOS. DIMMICK.—Sonoma and Napa counties.

THE DUTY OF THE HOUR.—Lest any reader should forget it, we meotion the peculiar fitness of the season for renewing old subscriptions and making new oaes to the PRESS. In going forward with our journal, we need the help of our patrons botb with mind and money. Do not forget to send the printer his due, as the aggregate of small individual amounts will give him a force that will make the types fairly dance into the lines. We trust that only a hint will be needed to rally the dollars, for with tbem assured we have a tbousand themes to occupy our columns. Let all step up promptly to the Captain's office and then we will go out on deck for another year's voyage —*January 1st, 1879.*

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicou. Eacb department increases daily, and the Pavilion performances are more popular thao ever. All new novelties fiud a place at this wonderful resort. Prices remain as usual.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Sbasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXAMINE the accelerative endowment plan, as originated by tbe Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Cohle, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

ARTESIAN WELLS WANTED.—Parties who are prepared to contract for boring artesian wells are iovited to send terms to Edward Frisbie, proprietor of the Reading Ranch, Anderson, Shasta County, Cal.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

HENRY R. EWALD is our general correspondent and agent for Arizona.

Chew JACKSON'S BEST Sweet Navy Tobacco

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending January 7, 1879.

Jan 1	Jan 2	Jan 3	Jan 4	Jan 5	Jan 6	Jan 7
HIGHEST AND LOWEST BAROMETER.						
30.02	30.13	30.14	30.15	30.26	30.23	30.40
20.73	30.07	30.07	30.01	30.20	30.12	30.28
MAXIMUM AND MINIMUM THERMOMETER.						
62	59	53	51	56	52	54
51	47.5	46.7	46	44	45	42.8
MEAN DAILY HUMIDITY.						
55.7	59	81.3	73.3	75.7	85.3	32.7
PREVAILING WIND.						
SE	E	SE	N	NE	NE	N
WIND—MILES TRAVELED.						
328	95	142	202	123	138	371
STATE OF WEATHER.						
Fair.	Clear.	Fair.	Clear.	Clear.	Cloudy	Clear
RAINFALL IN TWENTY-FOUR HOURS.						
					.04	.31

Total rain duriog the season, from July 1, 1878, 2.98 in.

METALS.

[WHOLESALE.

WEDNESDAY M., January 9, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, January 8, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., par. SILVER, 2@2½.
GOLD in New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@22 ℘ cent. discount.
EXCHANGE on New York, 35, on London bankers, 49¼@49½. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 87¾@89.
LONDON Consols, 94 7-16; Bonds, 109¾.
QUICKSILVER in S. F., by the flask ℘ lb, 40@41c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte County, California.

Notice is bereby given, that at a meeting of the Board of Directors, held on the 20th day of December, A. D., 1878, an assessment (No. 40) of five cents per share was levied upoo the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of tho Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of January, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 18th day of February, 1879, to pay tbe delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.
Office, 318 Pine Street, Room 6, San Francisco California.

Land Purchaser's Association.—Office, No. 318 Montgomery Street, San Francisco, California.

NOTICE -There are delinquent upon the following described stock, on account of assessment (installment No. 43) levied on the 5th day of November, 1878, the several amounts set opposito tho names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Mrs Matilda Stobr	38	1	$4 00
James L Beyea	43	1	4 00
V Chevallier	64	1	4 00
Geo S Dickey	98	1	4 00
W G Koch	178	1	4 00
Asa Fisk	220	1	4 00

And in accordance with law, and an order of tho Board of Directors, made on the 5th day of November, 1878, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Secretary, No. 318 Montgomery street, San Francisco, California, on Saturday, tbe fourth (4th) day of Jaonary, 1879, at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expeoses of the sale.
C. S. WRIGHT, Secretary.

Orion Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, tbat at a meeting of the Board of Directors, held on tbe 12th day of December, 1878, an assessment (No. 4) of twenty-five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of tho Company, No. 28 Sansome street, San Francisco, California.

Any stock upoo which this assessment shall remain unpaid on the 13th day of January, 1879, will he delinquent, and advertised for sale at public auction; aud unless payment is made before will be sold on Tuesday, the 28th day of January, 1879, to pay tbe delinquent assessment, together witb cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.
Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

Summit Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Mineral Poiut Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6,) levied on the 10th day of November, A. D., 1878, the several amounts set opposite tbe names of tbe respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Boring, I C	32	1200	$60 00
Bohn, John	150	200	10 00
Lehmann, C	129	2750	137 50
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Storer, J F, Trustee	58	250	12 50
Schmitz, F	205	400	20 00
Turner, J W	65	200	10 00

And iu accordance with law, and an order of the Board of Directors, made on the nineteenth day of November, A. D., 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, Cal., on Tuesday, the fourth day of February, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.
R. N. VAN BRUNT, Sec'y.
Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

ANNUAL MEETING.

The annual meeting of tbe stockholders of the California and Oregon Land Company, will be beld on Tuesday, January 14th, 1879, at 2 o'clock P. M., at the office of the Company, Room 6, No. 318 Pine street, San Francisco, for the election of a Board of Trustees, and tho transaction of such other business as may properly come before tbe meetiog. R. N. VAN BRUNT, Acting Sec'y.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE .... Manager.
F. LYSTER .... Acting Manager.
CHAS. H. GOODWIN .... Treasurer.
J. P. CHAPMAN .... Assistant Treasurer.

Open Every Evening with the Regular Company.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE .... Lessee and Manager

CALLENDER'S GEORGIA MINSTRELS.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR .... Manager.
BARTON HILL .... Acting Manager.

MR. & MRS. W. J. FLORENCE.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

STANDARD THEATER.

M. A. KENNEDY .... Sole Lessee and Manager.

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Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.

BUYER —AND— COMMISSION MERCHANT.

The undersigned, after an experience of forty years in the Grocery Business, has opened an office at No 24 CALIFORNIA STREET, corner Drumm, for buying and selling all kinds of Goods. Parties throughout the States and Territories wisbing an Agent in this Market for the transaction of their business, by entrusting the same to me, I can have special rates made, with full guarantee of satisfaction, or no charge for services.

With twenty-five years' experience in this Market, I think I can suit one and all, both as a buyer and seller. All I ask is a trial. I will also bave a Ladies' Department, under the management of a lady of experience and taste, who will fill all orders for your wives and daughters. Orders for this this Department should be endorsed: "For Lady Buyer."

All parties ordering will be required to send funds with order or satisfactory reference. Respectfully,

WHEELER MARTIN,
24 California Street, San Francisco.

REFERS BY PERMISSION.

Rountree & McClure .... 401 Front Street.
J. M. Pike & Co .... 101 and 103 California Street.
Marcus C. Hawley & Co .... Corner Market and Beale Sts.
Cutting Packing Co .... 17 to 41 Main Street.
W. W. Montague & Co .... 112 to 120 Battery Street.
E. Martin & Co. .... 408 Front Street.
Wellman, Peck & Co .... 416 and 418 Front Street.
Wheaton & Luhrs .... 219 Front Street.
Deming, Palmer & Co .... 202 and 204 Davis Street.
Armes & Dallam .... 115 and 117 Front Street.

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PORTABLE ENGINES,

FOR SALE CHEAP.

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Roasting of Gold and Silver Ores, and the Extraction of their respective Metals without Quicksilver. 1870.

This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and explains the why and wherefore.

It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus.

It is a work of great merit, by an author whose reputation is unsurpassed in bis specialty.

Price, $2.50 coin, postage free.

Concentration of Ores (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery etc., which alone are of the greatest value. PRICE, $7.50

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PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

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California Machine Works,

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☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE☜

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Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

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BUILDERS OF

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Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

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IMPROVED PORTABLE

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Steam Engines and all Kinds of Mill and Mining Machinery.

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MANUFACTURERS OF

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAC SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

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Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

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Mining Machinery.

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Hight—Inches...	3½	5	6	7½	8½	9	11	1
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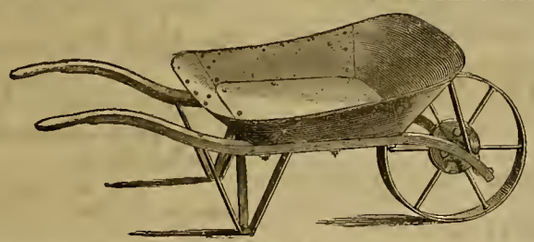

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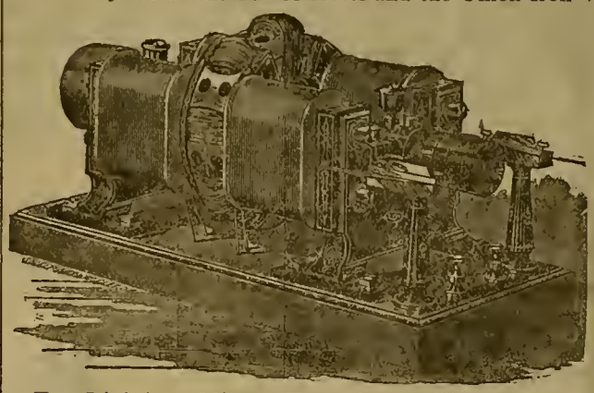

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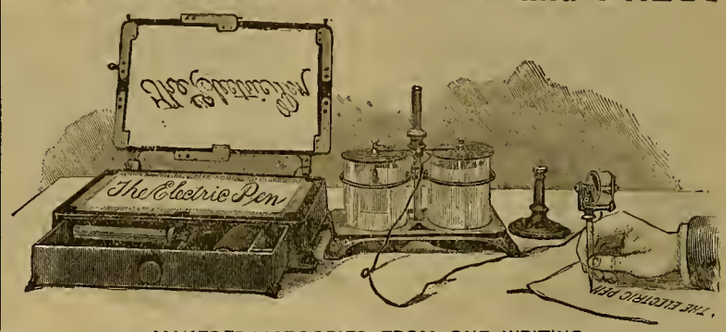

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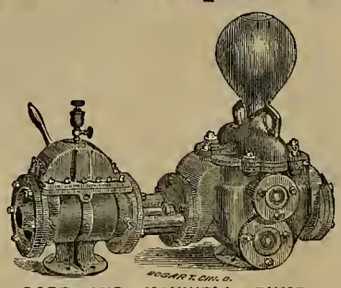

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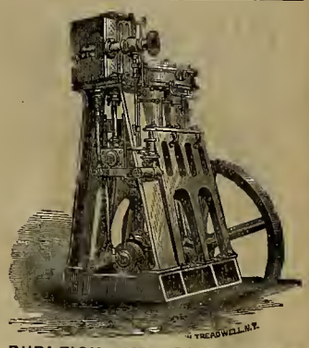

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☞The Best and Most Durable in use. Also, a variety of other
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For Mining and Farming Purposes.

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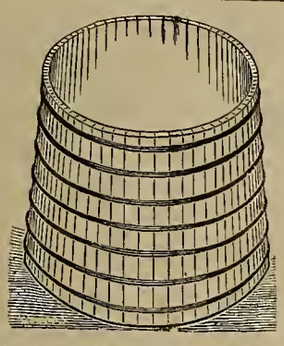

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The German Savings and Loan Society.
For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of seven and one-half (7½) per cent. per annum, and on Ordinary Deposits at the rate of six and one-fourth (6¼) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of January, 1879. By order.
GEORGE LETTE, Secretary.
San Francisco, December 31st, 1878.

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Manufacturer and dealer in all kinds of
Iron and Steel Wire Rope,
Flat and Round, for Mining, Shipping, Hoisting and General Purposes.
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Of all Sizes on hand or made to order.
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THE SAFETY STOP
On these Governors is alone worth double the price of the Governor. We have sold over six hundred, and
Never one has Failed.
They are sold at the samo price (or less) as ordinary Governors. Send for Circular.
BERRY & PLACE,
Market, head of Front St., San Francisco

Prompt Attention to Business.

AURORA, Nev., Dec. 7th, 1878.
MESSRS. DEWEY & CO., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JANUARY 18, 1879. VOLUME XXXVIII Number 3.

The Deane Mining Pump.

Notwithstanding the fact that direct-acting pumping machinery for draining mines costs much less than any other style, a prejudice exists against its employment on account of the concussion—so destructive to pipes and connections—that attends the use of improperly designed and constructed machines. This is claimed to be entirely obviated in the Deane mining pump, by applying a simple cushion (first used on these pumps) to the steam cylinder, compelling the piston to stop and start slowly at the end of each stroke, so that the water valves may have time to seat quietly, and cause no shock or jar.

The Deane plunger pumps, recently introduced here by Parke & Lacy, 417 Market street, in this city, have two plungers working in opposite ends of a water cylinder, divided in the center with valves of the most approved construction. They are intended for situations where the gritty nature of the water prevents the use of piston pumps.

Fig. 2 of the accompanying engravings shows one of these plunger mining pumps with 14-inch steam cylinder, 8-inch plunger, and 12-inch stroke.

Fig. 1 shows a Dean pump, piston style, with 12-inch steam cylinder, 7-inch water cylinder, and 12-inch stroke. The piston mining pumps are made from special patterns, and are designed for situations where the water is comparatively free from grit. They are also desirable for temporary work, and for duty where space is limited. They are lighter, more compact, and cost less than plunger pumps of equal capacities. The linings, water valve plates, piston rods, stuffing-boxes, and water piston-heads are of solid composition. The packing is of fibrous rings, or leather cups, as desired. They run without shock or concussion. The working parts are all readily accessible.

A very interesting little pamphlet has been published by the manufacturers of the Deane pumps, comparing in details the four prominent systems, viz.: Cameron, Dean, Blake and Knowles. These pumps are shown by diagrams, and their details of construction and operation compared one with the other. Those interested in pumping machinery for mines, will find it worth their while to send to the agents for this pamphlet, as it contains a great deal of information not readily accessible from other sources. We have only space for the concluding paragraph, which sums up the advantages of the Deane system as follows:

The Deane system is the *simplest;* as the parts peculiar to it are less in number than those of the Cameron, less than one-half those of the Knowles, and about one-third those of the Blake; is the *most positive*, as it has a straight mechanical connection between the main valve and the main piston; is the *most durable*, as the supplemental and the main are both flat side valves; is the *least liable to breakage* from external causes, as it has no complicated valve-gear, and what it has is between the steam and the water cylinder; in a word, it combines the greatest simplicity with the greatest perfection, both in theory and in practice.

Wintery Weather Note.—The Nevada State papers all talk of cold weather and snow. The cold weather of the past few weeks at Nevada City, terminated in a snowfall on the 8th. In the foothills, as usual, delicate fruit trees are less injured than in the valleys.

We have two correspondents in Arizona who will be heard from this week, probably. Although we are favored with occasional correspondence from all the outlying mining regions, our readers in Idaho, Montana, and Utah will hear in mind that their letters are always welcome; and that a paragraph from a reliable correspondent often goes farther than a heavier article. Every good mining district has its problem to solve, and its comparisons to work out, metallurgically and otherwise. The character of the ore deposits should be understood. Specimens to illustrate these can be sent to the University and to the Academy of Sciences by Wells, Fargo & Co.'s express without charge; and any letters sent to us descriptive of such, will receive due attention.

The great suit against the United States for 11,000 square miles of land in Missouri and Texas was decided by the Supreme court adversely to the claimants.

Fictitious Capital Stock.—An effort has been made in the Constitutional Convention at Sacramento, to cut down the fictitious capital stock so often put forward in the incorporations of mining companies, to something like a reasonable limit, by means of a tax, preliminary to filing articles for record. The Convention decided that such a tax would not be likely to prevent any of the real "wild cat" schemes from being brought before the people, whom it was sought to victimize; while it was certain that it would prevent many honest and meritorious companies from organizing, by placing unnecessary impediments in their way. No one can doubt the good intention of the mover, nor fail to see that it is the mining interest itself that suffers most from dishonesty in any form, that may be practiced by mining operators.

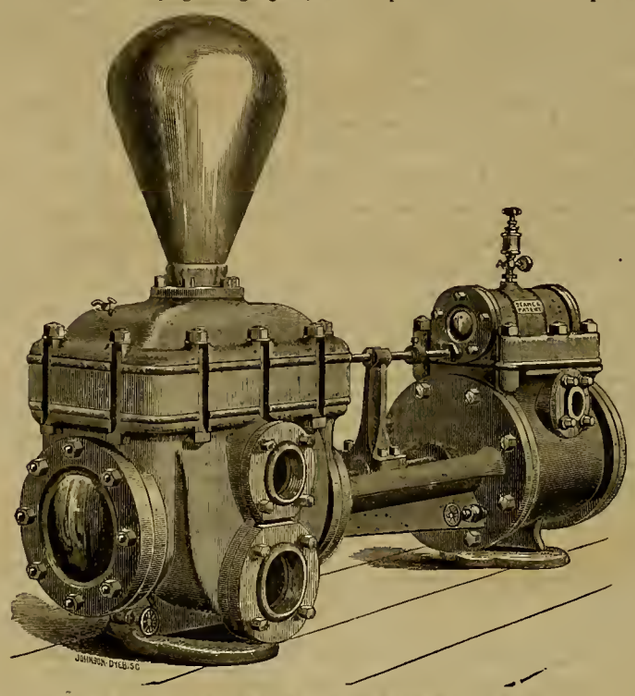

FIG. 1. THE DEANE PISTON MINING PUMP.

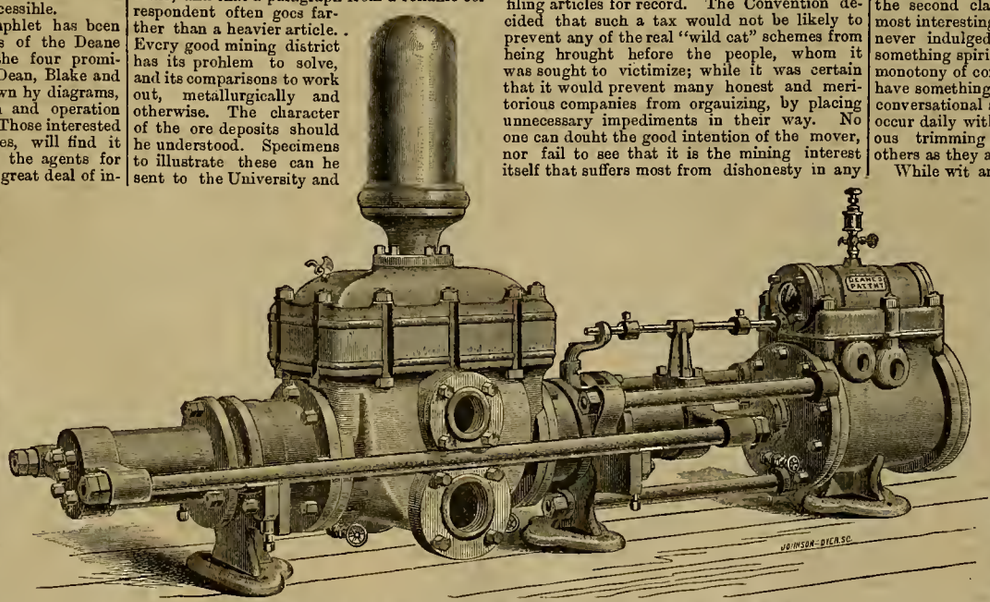

FIG. 2. THE DEANE PLUNGER PUMP FOR MINING PURPOSES.

The Giant Powder Works, half a mile south of Golden Gate Park, blew up on Monday, at two P. M., killing four persons. Loss, $55,000.

A natural mammoth cave has been discovered near Columbia, Tuolumne county.

Practice at the University.

The literary societies of the University at Berkeley conduct a monthly magazine, by electing from amongst themselves successive editors and assistants. The *Berkeleyan* is a portly individual of 63 pages, about one-third advertising matter, printed on the University press. Nothing could be more creditable to the donors of the printing office, and to the University, than such an evidence of vitality, and of a practical literary training. If the young men who are studying at Berkeley can learn, in their four years' course, how to be thoroughly informed on any given subject in practical life; how to write what they know in good enough English for the printer; and how to deliver themselves verbally, in good enough style to be tolerated by an audience of a dozen intelligent persons, they will have acquired the most useful part of the University training. In saying this, it is understood, of course, that the rudiments and the details of physics and the natural sciences, of chemistry and the arts, are a matter of life acquisition, in which the collegian is like the school boy and the man of the world who has never been to school, of course obliged to be "posted," if he would turn his efforts to any account. On the subject of training in the use of the pen, the retiring editor says several things which are the result of his experience, and which are equally applicable to the larger class of students of the world:

"Students are more liberal with their purses than with their literary efforts in sustaining a publication. All want to read, but no one wants to write and be criticised. With all our requests for contributions, we have met with but little return; we were obliged to go directly to the individuals, and to ask for what we wanted. Few articles have been volunteered, and those only were contributed which were read in class, and approved of and recommended, by the Professor of Literature. As a consequence we have received either biographical, metaphysical, or critical articles, and of these the second class predominated. One of the most interesting departments of literature was never indulged in—interesting narratives, or something spirited and light to bridge over the monotony of continuous metaphysics. We must have something light, something amusing. A conversational style would be good. Dialogues occur daily with us, which, with a little judicious trimming and polishing, would amuse others as they amuse us."

While wit and sentiment fill the brighter, yet they are only a small part of the field occupied by writers. Reports of investigations are the simplest form of writing; beginning with the simplest form of a letter. The art or industry requisite, however, in making out a perfect "brief," using the legal term—of covering all the information that is extant or obtainable bearing upon the case—are not often possessed.

The fact that good opportunities are given at the University to persons who may desire to make original investigations in agriculture, chemistry, mineralogy, metallurgy, geology and mechanics; that there are often excellent special topics suggested to be worked up, which have both a practical bearing and interest; that sections of the Academy of Sciences, embracing mining among other branches, microscopical and other societies, have now been organized within reach of the University collections—these are all matters worth noting, in this connection, as it is evident that the University is about to enter upon a more prominent career, in connection with the industrial and scientific progress of the coast.

Jay Cooke, the ex-banker, is in Utah.

Scenes in the High Sierra Back of Yosemite—Continued.

[Written for the PRESS by J. G. LEMMON.]

Glaciers and their Work.

Nowhers slse in California are glaciers more fully represented than here around the hases of this Lyell group of half a dozen peaks. It is not so surprising that the much loftier Whitney group to the south, nor the great domes of Dana and Gihhs northward, scarcsly retain an active glacier, when ws consider the character of their rock, reddish porphyry, greenstone and slates, all good ahsorhants of solar rays. The cold, gray granite and silvery quartz of Lyell, added to the interior location of the group, condense the moisture out of the over-blowing winds for a longer period of the year, to fall in copious showers of snow on their platsaus, thsn to crystallize to *neve*, soon hardening to fields of ice, called *Mers de Glace*, from whence glaciers emerge, grinding their way to the plain.

Firet the Facts, Then their Origin.

These *Mers de Glace* are rihhed from upper to lower side with hard snow, the lowest end the largest hetween each ridge, in the warmest hours of eummer days, there flows the daily melt of snow, filling the cracks that occur always in a mass of ice upon every change of temperature. Down each canyon of every peak, where favored hy shade, flows a frozen river, a glacier. On its back, regularly distrihuted, are rocks of all sizes, some partly covered with the ridges of snow. These glaciers move slowly down the canyons, which they exactly fill, to the level of the melting point at the present time in this region, at an elevation of ahout 11,500 feet. Arrived at the melting line the glacier ahruptly terminates in a sheer precipice, semi-circular in outline. Off from its edge, one after another, fall the rock passengers, forming a curved row of high-piled rocks, a moraine. These moraines are often one to two miles long in their sweeping curve and 50 feet high.

Following down the ravine, it is found to he smooth on the hottom and sides, with no sharp angles in its course, nor yet the short hends peculiar to water courses. At intervals, deep, round or oval lakes are found in or near the center of the ravine.

At every change of level, that is, every precipice down which this ravine-maker continues, just over the hrow there is found a moraine.

Farther on, when the plain is reached, the ravine joins with others to form a deep, narrow valley, strangely regular in contour, no sharp angles or hends, hut at a few points curving gracefully from side to eide, alwaye hending *away* from a trihutary, never *towards* one, as often do rivers.

The Glacio-Aqueous Epoch.

Before we attempt to interpret these phenomena, let us recall the glacio-aqueous epoch of the world's history, aud note the configuration given to our glohe hy the universal ice mantle. The waters of the earth then flowed at an elevation far ahove the tops of the present mountains. In the lapse of time, as condensation of the earth'e elements took place, the waters were gradually drawn off into preparing oceans, at the same time ridgee or undulating hilgee of the earth's crust appeared, constitutiug the present mountain chains, with their complement of material, now removed.

As the sea, with its immcnse blocks of ice, driven ahout hy wind and tide, receded, the icehergs hegan to touch the earth's ribe, and at once the work of grinding and denuding commenced. While age upon age elapsed, lower and lower sank the icy sea, and its ice blocks heat harder and harder upon the rihs. The weakest formed rock gave way first, and, it may he, that hetween now towering peaks there once exieted much higher, hut easier denuded rocks. At length the great icy sea receded until it hecame fenced into basins hy the appearing mountain chains. In the weakest places channels were formed, and as differences of level occnrred, as respects the hasins, the resistance of the sierra harriers caused tremendous pressure upon the sides of these channels, and thc ice hlocke squeezing through, often wrenched the toughest rocks from their ledges and hurled them upon the distant plain. Other rocke suffered the loss of crowns and angles and remain to-day as domes or bosses upon the flanks of the mountains, notably in the region of Yoeemite, where they may he counted hy the score, their scratched and polished eurfaces recording at once the hight, strength, and direction of the ice currents.

At last the glacio-aqueous epoch was ended. The waters were gathered into their future home, the ocean. The dry land appeared, strewn with debris for hundreds and thousands of miles on each eide of the mountain chains, while a warm atmosphere crept from the plains hy degrees up the mountains, clothing them with vegetation.

Next succeeded the wonderful phenomena of

Glaciere.

At first glaciers were developed on a scale so grand as to he scarcely conccived of now. Their work is denuding mountaiu ranges and eharpening domes into pinnacles, as did their parent, the icy sea, hut they toil in a very different manner, slow as the cycles of ages, silent as ths mold of the tomh. Their power is equal to the destruction of the highest mountains of the glohe, and to the furrowing of the despest Yossmites of the plateaus.

It all hegine with the Mers de Glace.

These masses of ice, at first, stranded upon plateaus, afterward formed from snow falling iu favoring localities, are fixed to ths earth, in winter, thoughout their extent, hy freezing. Certain points of greatest cold are dsveloped, coinciding prohahly with the lowest places. At these points the rocks are clasped firmly hy the ics and form a fulcrum for dynamic movements, which will he examined soon.

First, let it he remembered that ics expands when forming, ahout one-ninth of its volume.

Second, when crushsd at a temperature hslow 22° it rs-congeals, over and over again.

Third, that the force of ice-expansion is one of ths most powsrful known, utterly irresistihle.

Now from the point of greatest cold under an ice-field, this fulcrum firmly clasped, the ice expands hy congealing, thawing, crushing and regelation, and pressed in every direction, wrencbing off aud taking the contiguous rocks with it, and rasping them upon those left in the matrix.

The result is a epreading outward and upward of the mass of ice and consequently the excavating of the crater-like amphitheaters that are found, some of them now empty, on the sides of the mountains. This accounts also, for the holes aloug the glacier's track, once ice-womhs now filled with water-forming.

Glaciere at Work.

The upper edge of this powerful excavator impinges against the mountain, undermining rocks and earth, causing them to fall upou its hack, to he carried elowly down the frozen river, as seen.

When glaciers are in operation on hoth sides of a mountain rim, they remove all the material hetween, and thus isolated peaks are formed at the eide.

The greatest amount of pressure will he euccessful in the direction of least resistance, hence the final downward flow of the frozen river.

Glacier Lakes.

The *Modus operandi* of lake-forming is eo interesting that a few words of detail may he apropos. Anywhere that ice forms upon a plateau or mountain side, the work of excavating a hasin may commence, eo soon as the conditions are favorahle, *i, e.*, frequent thawiugs and freezings, which, as shown, are attended hy expansion, crushing of ice and regelation, the latter of course attended with renewed expansion. The fulcrum or fixed point would change from side to side of the hottom seeking the lowest place, from season to season, or rather from age to age. The result would be tbe scooping out of a crater of more or less depth, stopped only hy the condition of unchanged, low temperature reached at the hottom, generally several feet. When a change to warmer temperature occurs (which rise will soon show is sudden, and hy eeveral degrees at once), the ice is melted, and the ice-womh or fountain, hecomes a deep clear glacier lake, or oftcn, if in loose soil easily drained, remains empty.

These lakes distrihuted along a ravine, show where glaciers had their origin, or where portions of a flowing stream fastened on the hottom, for a period, and proceeded to digging wells upon the most gigantic scale, and with the most powerful yet eimple of mechanical agents, ice-expansion.

The warmth of the atmosphere in a distinct stratum at the melting limit, causes an ahrupt termination of the glacier, while its flow heing unhindered in the center, is faster there and causes the outward curve to its front, and this rain-how curve determines the shape of the moraine of rocks dropped from its brow, added to those disgorged from its mouth helow.

The regularity of form of the glacier hed results from the power of ice to remove ohstructions, like an immense furrowiug flow, and its graceful curves *away* from the entering tributary glacier shows hy the degree of deflection the size of the trihutary—a phenomenon never exhihited hy water currents.

Trains of rocks often seen, longitudinally disposed upon a glacier, show the union of two or more such trihutaries. Their rocks deposited upon the terminal moraine form nodules or heaps in the latter. When left *in situ* hy the sudden melting of the glacier, they form medial moraines; while those rocks carried outward to the side of the glacier form the third kind, lateral moraines.

Terminal moraines heing found deposited at the hrow of every precipice in the glacier's course, prove that the heat of the atmosphere has increased hy intervals of several degrees at a time, not gradually—a most important deduction from the study of glaciers, hearing upon the subject of climatology, the eudden withdrawal and introduction of different species of animals, and plants, etc. If the increase of temperature was gradual no terminal moraines of immense size as now seen, would be formed, hut the rocks would he scattered along the track of the receding glacier.

The few rocks found on the hack of a glacier, its very slow movement, the hottom of it only moving in summer, the swiftest recorded motion heing a Swiss glacier that only traveled 4,400 feet in nine years, together with the often, immense hight of the terminal moraines, 50 feet or more, all prove the necessity of vast periods of time required for their formation.

Finally the loug, deep, glacier-carved valleys, like the famous Yosemite, prove the prevalence of glaciers of prodigous size and powsr, plowing ths plateaus of the middle region of the Sierra, down to a low point near the foothills, the melting line heing met at their mouths at an elevation of only about 3,000 or 4,000 fset.

Climate Becoming Warmed.

From this hrief study of glaciers may he deduced a theory of ths positive increass of the earth's atmosphere as the ages have rolled hy; an increase which has advanced the melting point—33° Fah.—up the Sierra, 7,000 or 8,000 fset, since the day of the great glaciers. At that period, such valleys as Sierra and its sisters, now decorating the flanks of the Sierra north and south, were either lakes imprisoned with ice, or complete ice-womhs, the source of glaciers whoss moraines have heen scattered since hy floods from higher basins as their contents were feed; while the great valley of California, and the great basin of Nevada were cold, fresh water seas, their shores harely producing Arctic willows and sages.

At present the warm strata of air are found high up the mountains melting the few, short glaciere away nearly to their founts. When an increase occurs that shall melt them and the *Mers de Glace* all away, and there remaine no more perpetual snow and ice to keep springs and rivere alive in summer; the parched plaine heing mantled hy a torrid substratum of moistureless air, the poor inhahitants of earth, if living hy the same means as we exist now, may sigh for the return of the almost unknown and totally unappreciated hoon—a condition of climate that admits of glaciers.

Mines and Works of Almaden.—No. 18.

FOURTH PART.

Administration and Hietory of the Mines and Worke.

Translated for the PRESS from "ANNALES DES MINES."

I. Administration.

It remains, in order to complete this description of the actual situation of the mines and works of Almaden, to explain the organization of the general administration of the establishment.

The technical direction, or, as they say in Spain, *facultative*, pertains, under the control of the council of mines, to a certain numher, actually of four engineers of the corps of mines. The eldest has the title of director; of the three others, one has charge of the veins San Francisco and San Nicholas, the other of San Pedro y San Diego and also of the workmen, the third of the works, and at the same time the direction of the echool of master-miners at Almaden.

Each engineer has under his orders a certain numher of *capataces* (master-miners). Those of the mine go hy the name of *officiales* and of *ayudantes de mina*. They are suhmitted to a rigorous hierarchy; they come from the corps of timhermen, where they enter after three years study in the school at Almaden. Those of the works go hy the name of *officiales* and *ayudantes de destillacion;* they come from the corps of *auxiliairies de destillacion*, whose duty is the preparation of the charges; the corps of *auxiliaires* is taken from the scholars of the school of master-miners; as the watchmen of the mine, they are alternatively seven daye on duty and seven days at liberty.

The accounts, regulated on the same model as are the other accounts of the State, are confided to an *interventor principal* or *contador*, assisted by a certain number of clerks. A cashier has charge of the money vault.

The chief superior of the mines has the name of *superintendant;* he should he a *brigadier* (that is to say a hrigadier general) of the artillery or engineers. He is supreme judge in technical matters, those of accounts, or of administration; his authorization ie always necessary; he is responsible to the General Direction of the Domain (*Propriedades y Derechos*), which Direction is itself placed under the orders of the Minister of Finance.

The office of superintendent was suppressed in 1871, and replaced hy the institution of a commissary general at the mines of Almaden. This commissary was M. Monasterio. A deplorable riot occasioued—on July 4th, 1874—the assassination of M. Monasterio and that of M. Buceta, engineer of the mines; after thcse tragic occurrences the office of superintendent was re-established October 20tb, 1874.*

The services of the mines and works are performed, some under contract, othere under wages. The work done hy coutract, are, in the mines: the stoping, the huilding of the masonry, the extraction and the introduction, tho transportation intsrior and exterior, the hand pumping, the production of steam for the Watt engine, the repairing of tools, the purchase of wood for timhering, of lims, of sand, of bricks, of coal, of iron, of steel, of charooal, of lumber for carpenters; at the works: the manufacture of aludels, the repairing of furnaces, ths extraction of slag, the furnishing of fuel for the furnaces, the purchase of frascos, of iron, of sand, and of bricks.

The timhering, the distrihution and the care of tools, the charge of steam engines, the work of the shops, the forge, the carpsnter shop at the mine; the charging and discbarging of furnaces, the roasting of ore, the luting of aludels, and of doors, the cleaning of the chambers and aludels, the washing of the soot or cabszas, at the works, are, on the contrary, performed hy contract.

We have already stated hy what means the workmen are ahle to render useless the guaranties which the awarding of the work hy puhlic contract would sesm to offer; we will not return to it.

The following tahle shows the total numhsr of workmen occupied in the different establishments during these last years, and the corresponding produotion. The figures correspond each to a oampaign; the campaign hegine July 1st and fnieh es the 30th of June following:

Years.	At the Mine. Under Ground. Men.	At the Mine. Under Ground. Children.	At the Mine. Above Ground. Men.	At the Mine. Above Ground. Children.	At the Works. Men.	At the Works. Children.	In all.
1870-71	2,287	119	434	179	236	145	3,400
1871-72	2,832	162	494	164	255	158	3,505
1872-73	2,401	147	671	219	267	105	3,816
1873-74	2,031	142	669	213	289	172	3,497
1874-75	2,139	125	647	211	343	235	3,697

Production.

Years.	Ore.	Mercury.
1870-71	14,654.9 tons.	1,185.00 tons.
1871-72	15,527.8 "	1,135.00 "
1872-73	13,509.3 "	1,155.28 "
1873-74	13,714.4 "	976.10 "
1874-75	19,182.6 "	1,264.00 "

The total numher of workmen employed, compared with the figures showing the production, would hc difficult to understand if we did not add eome explanations. There is no one who is occupied in a continuous manner at any one of the establishments of Almaden; according to the kind of duty, the men work one day out of two, or one out of three, or even less; the rest of the time they are occupied with different private works. This eituation ie due in part to a desire to furnish work to the greatest possihle numher of inhahitants; hut it has a much more serious cause which would never permit a different organization.

It is known, in fact, how the mercurial emanations are injurious to the health of those who are exposed to them. They produce first ptyalism (excessive salivation), loosening of the teeth, ulceration of the mouth; then penetrates little hy little the entire organism, and then give rise to a particular tremhling which a long sojourn at the establishment of Almaden does not allow any one to escape. This tremhling is accompanied hy an almost complete loss of powers, and a sad weakening of the intellect.

The intermittance of work allows them to overcome, at least partially, thie mercurial malady; and it is for thie reason, much more than as a consequence of the ideas of inveterate socialists, that the State gives employment at Almaden to a number of workmen much greater than is strictly necessary to the execution of the different works.

The workmen attacked hy the malady have at their disposition a hospital estahlished under excellent conditions. Those whose constitution has hecn strongly attacked hy the malady in consequence of a long sojouru at the mines or at the works, can obtain the concession of a certain amount of land to cultivate in a domain of 7,000 hectares, ealled the domain of Castilseras, which belongs to the estahlishment of Almaden. This domain does not yield anythiug, or scarcely anything, and thc expense of keeping it up increases somewhat the cost of extracting the mercury.

The financial service has heen simplified somewhat since 1870, in consequence of a treaty coucluded hetween the treasurer and the house of Rothschilds.

In order to secure and re-imburse a loan of

Continued on page 38.

*The 4th of July, 1874, should have been the time of renewing the contracts; the engineer, D. Isidro Sebastian Buceta presided at the public meeting for awarding the contracts, when he was suddenly assailed from all sides, and quickly beaten to death. The workmen over-excited to the point of madness ran through the town to find M. Monasterio, who was not able to escape, and was massacred in the middle of the town. He payed with his life for the generous efforts which he had made for the improvement of the mines, of which he had the chief direction. All this was an unfortunate drama, of which the true causes have never been elucidated, and the most guilty authors of which have not been punished for want of proof; politics were no doubt not entirely unconnected with it, and it is to-day believed that this sad riot was fermented by certain socialistic agents, similar to the case of Carthagenia. After these events, the most absolute authority was given to the engineers over the workmen, who have, nevertheless, already retaken great liberties.

MECHANICAL PROGRESS.

A New Direct Process for Making Wrought-Iron and Steel.

We have already made brief reference to some important experiments in the way of a new process for making wrought-iron and steel direct from the ore, which have recently been made under the direction of Mr. Charles M. Du Puy, of Philadelphia. This process is essentially different from all others heretofore either employed or proposed. A full description of the same, with practical results, was given in a paper read by Mr. Du Puy, before the meeting of the Franklin Institute, on the 20th of November last. We regret that we have room for only a brief synopsis of that paper.

This Process Consists

First, in mixing and grinding together in proper proportions the ore, coal, and fluxes. The ground mass is then filled into annular sheet-iron cases or rings without top or bottom. Any desired number of these cases, according to the capacity of the furnaces, are then placed therein side by side, and subjected to the gradually increasing heat of a reverberatory furnace, and in about five hours the ores and their containing cases settle down and become welded into quite compact lumps of iron, which may be removed and welded together, or squeezed and sorted into "muck-bar."

It will be seen from the above that this process is quite the reverse of the blast-furnace method. In that, a tuyere conducts a stream of oxygen into close contact with the ore in the presence of a high heat; while in this, oxygen is excluded, as far as possible—and the moderate heat—from 800° to 1,000° Fah—prevents the combination of phosphorus with the iron. The work is done by reflected heat from the furnace roof. It may be termed a *baking*, instead of a *smelting* process.

Experiments with this Process

Have been made at the Crescent Steel Works, at Pittsburg, Pa., and also in Reading. Over 50 experiments were made at the latter place during the month of August last, with most satisfactory results. Various kinds of ores have been worked—magnetic ore from West Point, ore from New Jersey, Cumberland Valley ore, hematite ore from Newark, besides several others. These ores were worked both separately and combined; were reduced and forged to blooms, and the blooms reheated and drawn out smoothly under the hammer or rolls. Several crucibles of steel were made from the iron and forged into planing tool, which stood all the usual tests.

The iron produced at the Crescent Steel Works was carefully tested in the customary ways to determine the value of iron for high grades of steel. The result showed that it was equal to the most costly grades of Swedish iron. Various fuels were employed in these experiments, and it was shown that good tool steel could be made from iron produced by *anthracite coal dust!*

Further Experiments.

In addition to ores, experiments were made in reducing the scale from rolls—almost pure oxide of iron—which when closely mixed with ground, ore and reduced by anthracite dust forged readily into good bloom. The refuse of iron pyrites, from which the sulphur had been extracted at the New Jersey Chemical Works, and which has hitherto been entirely useless, was also treated with anthracite dust, forged into blooms, reheated, piled with one-third its weight of common muck-bar and plated out well into smooth sheets of No. 26 iron.

Very little labor is required in the process, while the expensive fluxes, such as soda, manganese, etc., are not used at all. A proper mixture of aluminous and calcious ores with lime, to produce a non-flowing glassy slag, was all that was required.

The Economy of the Process.

These experiments prove that good steel can be produced by the De Puy process from iron deoxidized either with charcoal, anthracite-dust or coke-dust. Thus the very cheapest of fuels can be used. It should also be stated that all the experiments were conducted with ordinary furnaces, and such as were not specially adapted to the work; but rather with many inconveniences and unsuitable conditions.

A suitable furnace for the work, from which half a ton of blooms may be produced every 24 hours, need not cost in Pittsburg over $1,000. Only a little lime in combination with waste coal slack—charcoal, anthracite or coke—furnishes all the accessories required. The most common No. 26 iron is also sufficient for the cases. Two men in 10 hours with a 15-horse power engine, will grind and mix and fill the cases for seven tons of blooms. The furnace work is confined to charging and discharging and firing—there being no necessity for manipulating the metal from the time it is charged in the furnace until it is brought to the hammer or squeezer.

It is claimed as proven by the experiments—several hundred of which have been made upon a working scale—that in favorable localities, as in Pennsylvania, where ores can be laid down for $3 per ton, and anthracite fuel obtained comparatively low, blooms, nearly freed from phosphoras, can be manufactured for from $18 to $20 per ton, equally as good as those now produced at a cost of $38 to $50 per ton.

The facts given above appear to be put forth on the highest authority, and the experiments have been conducted on a working scale, and in the presence of numerous practical parties, well qualified to judge of the facts. Is it not possible that this process may be made available here in California? May it not, with perhaps an increased degree of heat, and superior fluxes and fuel, be made applicable for the reduction of the iron sands which are found in such immense quantities along the shore line of this State? At all events, if the foregoing facts are to be relied upon, this process must introduce an improvement into iron and steel making, such as has not been equalled since the introduction of the Bessemer process.

Repairing Boilers.

The following hints in reference to repairing boilers are taken from the *American Machinist:*

It is commonly noticed in boilers that have seams of rivets exposed to the action of the fire, that after being at work for some time, cracks begin to appear, running from the rivets towards the center of the plate. The cause is that one lap being covered by another, prevents the water from getting to the one nearest the fire; consequently the lap nearest the fire becomes hotter, and expands to a much greater extent than any other part of the plate, and its constant unequal expansion and contraction, as the boiler becomes alternately hot and cold, inevitably results in a crack. These cracks may be temporarily repaired by drilling a hole in the bottom or extremity of them, so that the crack is completely drilled out; and, as a rule, this may be safely done if the crack is not more than three inches long, but if of greater length, do not tamper with it but have the plate cut out, if possible.

If it is not practicable to take the plate out, cut out so large a piece that the seams of the patch shall be as far from the fire as possible. Let it be well borne in mind that, in addition to the two laps causing unequal expansion, the sediment or scale inside the boiler obstinately sticks in between the rivet-heads and under the edge of the lap, from whence it is seldom or never properly removed in cleaning the boiler. After drilling out the end of the crack, countersink the drilled hole, and also the hole in the seam above it; so that when rivets are again put in, they will meet each other, or nearly so. Let the heads of these rivets be as thin as possible, so as not again to retain the heat, or attract or harbor dirt.

Sometimes it will be observed that a crack in the seam is running from hole to hole between the rivets. This is always dangerous, and the cracked plate should be cut out and replaced by a new one as soon as possible. In putting patches on any part of a boiler, never cut a hole out with square corners, like the inside of a picture frame; but cut the holes which are to be covered with a patch, round, or as nearly circular as possible. But it is always better "not to put a patch on," but to cut out the defective plate and put in a new one, thus making the boiler as nearly as possible what it was when new. In putting a new plate in a very old boiler, it is advisable to have it a little thinner than the old plates were when new, say one-sixteenth of an inch. In putting on a new plate arrange it, if possible, so that the caulking shall be done on the new iron; but never place the edge of the laps toward the fire, unless a considerable distance from it.

UTILIZING THE WASTE HEAT OF EXHAUST STEAM.—Mr. James Atkinson, recently described before the American Society of Engineers a new apparatus for utilizing the waste heat of exhaust steam. This apparatus consists of a number of straight tubes screwed into a tube plate, which forms the base of an inclosed cylindrical vessel containing the tubes and the water to be heated. These heating tubes are closed at their upper ends, but are open at the bottom to the exhaust steam, for which a short direct passage is provided. Small circulating tubes draw any air out of the heating tubes which would prevent them being filled with steam. The latent heat of a portion of the exhaust steam is transmitted through the heating tubes to the feed-water which is forced through the heater, and passes into the boiler at a temperature of from 210° to 212°. It is claimed that this heater is perfectly free from back pressure in the engine.

A NEW FEED PUMP.—A pump, which seems to have been working for almost two years successfully, has been described recently by Chiazzari, of the Alta Italia railway. It is used for feeding locomotive boilers with hot water heated to within a few degrees of the boiling point. It consists in bringing the feed-water, in a finely-divided spray, into contact with a portion of the exhaust steam during its passage through the feed-pump, and of an automatic arrangement for shutting off the supply from the tender the moment the regulator is closed, thus preventing the admission of cold water to the boiler.

SCIENTIFIC PROGRESS.

New Alleged Discoveries in Petroleum.

The *Oil and Drug Reporter* has been shown specimens of what were claimed to be *saponified petroleum*. These specimens were shown in different forms—as emulsion, paste and cake. "Upon a close inspection," says the *Reporter*, "they appeared to be perfect specimens of saponification, and we were assured that no oleaginous matter, except petroleum oil, was introduced in their composition. These seemed to be a practical contradiction of the theory that petroleum oil cannot be saponified in the very nature of things. Such has been our impression, not from actual experiment, but based upon the statement of experts, who insist that petroleum can be rendered miscible only, and we know that it has been tested by various parties with great care and persistence. We confess our incredulity in the matter, but it is not safe in these days of discovery to doubt the solution of any scientific problem, and we can only say that we hope the enthusiastic author of this long-sought consummation is not deceiving himself. They are claimed to be applicable, to the purposes of scouring and finishing in textile manufactures; to domestic and toilet articles, and by reason of their antiseptic and healing properties, to medicinal preparations. But this is not all. We are assured by the same gentleman that he had eliminated an aniline black from petroleum, which was at once dense, brilliant and permanent; air and exposure to light serving to intensify and make it more firm. This, too, if it shall be assured, will prove another great achievement in industrial art."

In connection with the above, Maj. Henry Howell, of Sarnia, Canada, claims to have discovered a new process of refining petroleum without the agency of heat. A sample manufactured from American petroleum of 45 gravity is stated to be a very brilliant and white oil of 48 gravity and 122 fire test. The yield from the crude was 93%. But the most extraordinary claim for this process is not merely that the means used are entirely mechanical, but also that there is no production of gasoline or benzine, and the entire product is standard white illuminating oil, superior to the oil refined under old methods. This new process, if what is claimed for it be true, is just precisely what the producers have been looking for. But how the lighter parts of crude petroleum can, by a mere mechanical process, be retained so as to stand a fire test of 122°, is something truly wonderful, and is simply equivalent to a mechanical decomposition of a chemical compound.

WHAT SCIENCE HAS DONE FOR PRODUCTIVE ARTS.—When gas was first made for illuminating purposes, some of the substances produced by the distillation of coal and the purifying of the gas, were considered unmitigated nuisances. But these disagreeable products did not escape the persevering investigations of the chemists, and the results are among the wonderful discoveries of science. A curious illustration of this economical value of the ammoniacal liquor is given in the report of the business of the gas works at Bradford, in England. For 10 years a contractor paid £800 a year for this substance, now a new contract has been made by which the company receives £10,359 per annum for it. Fifty one thousand seven hundred and ninety five dollars is a very pretty sum to receive for an article formerly regarded as having little value. The brilliant colors produced from this liquid makes its great value.—*Paint and Drug Reporter.*

THE THIRD FORM OF CARBON IN STEEL.—Mr. Henry G. Dehrunner, in reply to Mr. Blodgett Britton's letter on the third form of carbon in steel, states that he is led to the belief that the latter's semi-graphitic carbon and his semi-combined form of that element are not identical. The product of the action of nitric acid (1.2 sp. gr.) on an iron carbide containing what he has called the semi-combined modification of carbon, is a black powder, which in no other but the mere physical quality of color resembles graphite, while its entire chemical character is similar to that of combined carbon. It dissolves in nitric acid on heating, and causes steel to harden on being dipped at red heat in water, exactly like combined carbon, from which it only differs by the physical *habitus* of its products on solution of steel in cold nitric acid.

SOLUBILITY OF PHOSPHORUS IN ACETIC ACID.—G. Vulpius reports that, by digesting phosphorous for some time in concentrated acetic acid at a moderate heat, about 1-100th of the weight of the latter is dissolved and kept in solution on cooling. If only a few drops of water are added, however, the solution becomes milky from deposited phosphorus, and when the addition reaches the volume of the solution used, no phosphorus at all will be retained in solution.—*Archiv de Phar.*

SCIENCE IN NATURE.—"Everything," says Hugh Miller, "is writing nature's history, from pebble to planet. The scratches of the rolling rock, the channels of the rivers, the falling rain, the buried fern, the footprint in the snow, and every act of man, inscribes the map of her march. The air is full of sounds, the sky is full of memoranda and signatures which are more or less legible to every intelligent human being."

The Mound Builders' Unit of Measure

Mr. J. W. McGill, who has been making a critical study of the artificial mounds of northeastern Iowa and contiguous parts of Wisconsin and Minnesota, finds considerable evidence of the employment of a unit of measurement in their erection, the possession of which would prove the mound builders to be tolerably advanced toward civilization when they entered the country. In the *American Journal of Science and Arts*, for October, Mr. McGill gives a large number of measurements made by him in one of the most extensive systems of mounds in northeastern Iowa, and arrives at the conviction that the linear unit employed by the builders was simply, or had grown out of, the pace or yard.

The northern limit of the mounds of definite dimensions is not certainly known. Mr. McGill has sought vainly for evidence of the use of measurements in the most northerly of the mounds. His own examinations so far extend only to latitude 43° 30′ N., and there the mounds are of constant or related dimensions. The most northerly of the measured mounds are undoubtedly within Minnesota.

In conclusion Mr. McGill observes that if we assume a slow southerly migration to have taken place in the mound builders, it will explain the evident increase in geometrical knowledge attested by the various works found in passing across the United States from north to south. In the Northwest we find measurements of simple lines, but not of angles or areas. In Ohio, angles were correctly measured, the squares being accurate squares and the circles perfect circles; and areas were measured, as attested by adjoining squares and circles being equal or very nearly equal in area, though there is no satisfactory evidence that the cardinal points were known. In the lower Mississippi regions the cardinal points were known. The gradual modifications in the various arms and implements, and the striking improvements in pottery, together with many other important considerations, lend support to this view.

Peculiar Behavior of Cast Iron.

A peculiar phenomenon has been repeatedly noticed with cast iron long submerged in the sea. A gray, spongy, light mass is formed, which in several cases when brought to the surface ignited spontaneously. Thus, for instance, cast-iron cannon raised after 50 years from a man-of-war sunk near Cariscrona, were reduced one-third to the mass described above. After being exposed to the air for about 15 minutes the cannon became so hot that they could not be touched, and the water with which they were moistened was converted into steam. During a naval battle between the French and the English in the year 1545, an English vessel was sunk off Portsmouth. Three hundred years afterward the bronze ordnance of the man-of-war were raised by divers. In one of them there was a cast-iron ball, which, as soon as it came into contact with the air, was heated almost to redness, and then fell to pieces, which weighed together only 19 pounds, while to judge from its diameter the ball must have weighed originally about 30 pounds. Modern chemical science would find it easy to trace the causes of this phenomenon, while a 100 years ago somewhat violent assumptions were deemed necessary to account for it. Thus a ship's physician has placed the following explanation on record: "It is probable that the cannon were sunk in the heat of battle, and therefore had not sufficient time to cool off." Thus the heat must have remained in suspense for a long time, which may account for its promptness in making itself manifest upon return to the outer world.

THE MICROSCOPICAL STRUCTURE OF SPIEGELEISEN.—An interesting inquiry into the microscopic structure of spiegeleisen, by Herr Martens, appears in the November number of the *Zeitsch. des Ver. Deut. Ing.* He states that spiegeleisen consists of a mechanical mixture of the chemical combination between iron and carbon, and of iron without chemically combined carbon; and he finds that the two constituents of this mixture are placed together regularly, and according to determinable laws, the former constituent crystalling after the rhombic system, the latter after the quadratic system. The individual constituents assume the tempering colors at different rates, and so they can be sharply and distinctly recognized in grindings.

NEW MODE OF DETERMINING MOLECULAR WEIGHT.—In the course of some recent experiments Mr. Naumann has discovered indications of a new method of determination of molecular weight, which is specially applicable to substances which, in the pure state, are not volatile without decomposition. In studying the distillation of liquids, which cannot be mixed with water, by a current of aqueous vapor at constant boiling temperature, he has found that the quantities of two liquids passes in distillation and estimated in molecular weights, are in the same ratio to each other as the tensions of vapor of these liquids measured at the constant temperature at which distillation is effected.

A NEW MODE OF OBTAINING HYDROGEN.—Fire is generally used for producing hydrogen on a large scale; but recently a new method has been suggested by Dr. Kollman of the Berlin School of Mines. He states that the gas can be easily produced and at a lower price from ferromanganese by treating it with sulphuric acid.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 26.		Week Ending Jan. 2.		Week Ending Jan. 9.		Week Ending Jan. 16.	
Alpha	13¾	9¾	11	10¼	11¾	10½	12⅞	11¾
Alta	5⅝	5¼	5½	5	5⅝	5	8	6¾
Andes	50c	40c	50c	....	65c	50c	....	....
Alps	....	....	....	....	....	....	....	....
Argenta	3½	2.70	2.90	2.60	2.65	2.60	1.35	50c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	1.40	1½	2	1½
Belcher	3.90	3½	3.80	3½	4.30	3.80	4.90	4¼
Belmont	30c	10c	60c	10c	60c	....	60c	50c
Best & Belcher	18	17¼	18½	17	18¾	17¾	24½	19½
Bullion	5½	4¼	5⅝	4.65	7	5⅝	8½	6¾
Bechtel	70c	50c	70c	50c	60c	50c	60c	50c
Belle Isle	20c	....	20c	15c	70c	....	20c	....
Bodie	12	7¾	8	7¾	9	7¾	9¼	6½
Benton	3.60	3	3¼	2½	3½	3	4¼	3.20
Bulwer	16	14	15	14¾	15	10	15	14
Boyle	....	....	....	....	....	....	....	....
Black Hawk	40c	....	....	....	30c	10c	60c	50c
Belvidere	50c	30c	75c	50c	60c	....	60c	....
Booker	50c	30c	60c	50c	50c	45c	40c	....
Caledonia	2½	2.30	2.55	2¼	2.95	2.40	3.20	2⅞
California	10	9½	10½	9¼	11½	10⅝	11½	9⅝
Challenge	1.85	1½	1.70	1.60	2	1½	2.95	2.40
Chollar-Potosi	39½	38	47½	38½	46	41½	52	44½
Comanche	....	....	....	....	....	....	....	....
Confidence	9½	8¾	9¼	9	10¾	9	15	12½
Con Imperial	95c	70c	80c	70c	85c	75c	95c	75c
Con Virginia	8½	7¾	8½	7¾	9⅝	8½	8¾	7½
Crown Point	3.80	3.60	3.65	3.45	3.90	3.60	5¾	3.95
Con Washoe	....	....	....	....	3.10	2.10	2.10	....
Champion	15c	10c	40c	30c	....	....	40c	10c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	15c	....	10c	....	10c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	25c	....	30c	....	25c	....	25c	....
Eureka Con	33½	32	32	31	32¼	31	31¾	26¾
Exchequer	4.40	3.60	4.40	4	5⅛	4½	5⅝	4¾
Endowment	40c	10c	35c	30c	....	....	35c	30c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	9½	7¾	8½	7⅞	7½	5¾	5¼	4
Gila	....	....	....	....	25c	15c	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	6	5½	5¾	....	5¾	....	5	....
Goodshaw	40c	30c	40c	30c	40c	30c	35c	30c
Gould & Curry	9¼	8½	9½	8¾	11⅝	9½	16¾	10⅞
Hale & Norcross	11¾	10	12½	10⅝	14¾	12¼	20	14½
Hillside	2¼	2	2¼	2	2.10	2	2.10	....
Highbridge	2.35	2¼	2.40	2¼	2.45	2½	2.05	1¾
Homestake	....	....	....	....	....	....	....	....
Hussey	35c	30c	35c	....	30c	15c	15c	....
Independence	1.30	1½	1¼	1.20	1.10	1.05	1.30	1.05
Julia	3	2.90	5⅝	2¾	4.15	3½	3.90	3.40
Justice	4	3½	3¾	3½	4½	3.90	4¾	3.90
Jackson	9½	8½	7¼	7	9	7¾	7½	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4½	3.70	3.90	3.70	4.85	3.95	5¾	4¾
Kossuth	20c	15c	20c	15c	50c	20c	20c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.05	75c	90c	50c	75c	50c	75c	55c
Lady Wash	1	90c	80c	70c	1½	65c	1.30	1.20
Leopard	1	....	1	....	50c	....	....	....
Leviathan	40c	30c	50c	35c	65c	50c	55c	50c
Leeds	1½	1.15	1½	1¼	1	....	1.10	1
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	50c	....	....	....	....	....
Modoc	....	....	60c	....	60c	50c	50c	....
Manhattan	4.15	4	4¼	4	4½	4	4¼	3.35
Martin White	6	4½	5	....	4½	4	4	....
McClinton	50c	40c	40c	....	40c	25c	40c	25c
Meadow Valley	....	....	20c	....	20c	....	20c	....
Mexican	31½	27¼	81	28	33	30½	34	29¾
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	2½	....	....	....	3	2¾
North Con Virginia	5½	4	5½	4½	6¾	5½	7¾	5¾
New York	85c	60c	65c	55c	90c	75c	75c	65c
Northern Belle	10	9¾	10	9¾	9¾	8½	8¾	7¾
New Coso	25c	20c	....	....	....	....	20c	....
Navajo	50c	40c	45c	40c	45c	35c	45c	35c
Occidental	....	....	....	....	....	....	1	80c
Ophir	38¾	37	36	33¾	35¾	33	36½	31
Oriental	75c	60c	65c	....	1¼	80c	70c	50c
Overman	10¼	9¾	9¾	9½	10	9½	11¾	9¾
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	30c	30c	25c	40c	25c	50c	40c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	9¾	6½	8⅝	7½	6½	5	8½	7
Richer	75c	60c	50c	40c	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	9⅝	8¾	10½	9½	13¾	10¾	16	13½
Seg Belcher	20	18	18	17	20	....	21	20
Sierra Nevada	48	44½	43½	37½	43	41	56	42
Silver Hill	1.65	1½	1¾	1.30	2¼	1.40	1¾	1.55
Silver King	....	....	10	....	....	....	....	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	40c	25c	25c	20c	30c	20c	50c	20c
Summit	1.15	1	1.30	80c	1½	1½	2¼	1.60
Scorpion	1.15	1	1	50c	....	....	1.60	55c
Solid Silver	50c	....	50o	....	50c	....	1.80	50c
South Bodie	....	....	....	....	25c	....	....	....
South Standard	30c	25c	25c	....	....	....	10c	....
Star	50c	25c	50c	....	50c	....	50c	....
St. Louis	....	....	....	....	....	....	70c	30c
Syndicate	2	1¾	1½	....	....	....	....	....
Tioga Con	1½	1	1¼	1	1.20	1	1.60	1¼
Tiptop	1½	1.35	1.40	1½	1.30	1½	1.20	1
Trojan	30c	25c	30c	25c	60c	30c	50c	....
Union Con	59¾	55½	58	52	58½	56	63	56¾
Utah	13½	12½	11¾	10¾	13¾	11½	22	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	60c	50c	1¼	50c	75c	70c	75c	65c
Wells-Fargo	20c	10c	20c	15c	20c	15c	20c	....
Woodville	25c	....	25c	....	....	....	50c	20c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15	14	14⅝	13¼	16½	13¾	20	16½

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 10.
340 Alta......6¾@7
90 Alpha......11¾
460 Best & Belcher...19½@20
1515 Bullion......6¾@7
60 Belcher......4¼
555 Benton......3½@3.20
50 Baltimore Con......1½
1725 Con Virginia......7½@7¾
650 California......10¼@10½
20 Chollar......44½
1135 Crown Point...3.85@3.95
1595 Con Imperial......85@75c
175 Caledonia......2¾@2.80
710 Confidence......14@12½
1020 Challenge......2.20@2.40
995 Exchequer......4¾@5
175 Flowery......15c
520 Gould & Curry......10¾@11
45 Hale & Nor......14½@14¾
340 Justice......4.10@4
515 Julia......3.40@3½
315 Kentuck......5@4¾
400 Kossuth......20c
50 Lady Wash......1.20
600 Lady Bryan......60@65c
300 Leviathan......50c
100 Morning Star......3
130 Mexican......29¾
390 North Con Vir......6@5¼
350 N Bonanza......1½
50 New York......75c
120 Overman......9¾@9¾
225 Ophir......31½@31¼
250 Phil Sheridan......40c
150 St Louis......70c
125 Sierra Nevada......42@43
640 Savage......13½@13½
290 Silver Hill......1.55@1.60
2140 Solid Silver......50@80c
50 Succor......25c
1950 Trojan......50c
540 Union Con......57@56¾
130 Utah......13½
150 Wells-Fargo......20c
1110 Yellow Jacket....16½@17½

AFTERNOON SESSION.
1090 Argenta......1.30@1¼
125 Albion......1
100 Bechtel......60@50c
195 Bodie......9@9½
120 Belmont......60c
50 Bulwer......15
120 Booker......40c
100 Black Hawk......50c
750 Belle Isle......20c
175 C Pacific......1.80@1¾
720 Dudley......75@65c
200 Day......25c
175 Eureka Con......30¾@31
500 Endowment......35c
300 Goodshaw......35c
1705 Grand Prize......5¼@5½
600 Golden Terra......5
150 Hussey......15c
1050 Highbridge......2@2.05
580 Independence .1.05@1.10
30 Manhattan......4¼
580 Mono......2¼@1¾
130 Martin White......4
305 Modoc......50c
120 New Coso......20c
320 Navajo......45@40c
125 Northern Belle......8
330 Oriental......65@70c
1000 Paradise......3
150 Raymond & Ely......7½
200 S Standard......10c
50 Summit......1.60
200 Tioga Con......1¼@1.40

Saturday A.M., Jan. 11.
370 Alpha......12¾
300 Alta......7@6¾
50 Andes......50c
75 Albion......1
2230 Argenta......1.35
250 Belmont......60@70c
900 Best & Belcher...22@22½
1260 Bullion......7½
680 Belcher......4.80@4.90
370 Bodie......9¼@9½
500 Baltimore Con...1.60@1½
680 Benton......4½
25 Bulwer......15
100 Belvidere......60c
500 Champion......40c
845 Con Virginia......7⅞@7¾
630 California......10⅝@10¼
885 Confidence......14¾@15
35 Chollar......46@45½
655 Crown Point......4.30@5
640 Con Imperial......95@90c
345 Challenge......2.80@2.90
1210 Caledonia......3@3¼
900 Dudley......75@70c
955 Exchequer......5½@5¼
160 Eureka Con......30½@31
300 Flowery......25c
1245 Gould & Curry...11¾@12½
1265 Grand Prize......4¾@5
20 Gila......15c
200 Goodshaw......30c
95 H & Norcross......14¾@15
600 Highbridge......2.05
75 Hillside......2.10
585 Justice......4@4.10
850 Julia......3½@3.40
50 Jackson......7½
195 Kentuck......5@5½
150 L Bryan......65@60c
450 Leviathan......55@50c
220 Lady Wash....1.10@1.55
260 Mexican......30½@31
160 Morning Star......3@2¾
500 Meadow Valley......20c
50 Manhattan......4
50 Mono......2
100 Modoc......50c
50 McClinton......35c
100 New York......70c
170 N Con Vir......6@5⅞
1280 N Bonanza....1.20@1.40
20 Northern Belle......8½
400 Navajo......40c
165 Ophir......32@32¾
225 Overman......10⅞@11
100 Occidental......1
650 Oriental......60c
1610 Paradise......3.30@3½
100 Raymond & E......7½
1070 Savage......13½@13¼
80 Succor......20@25c
215 Sierra Nevada....43½@44
825 Silver Hill......1.70@1½
1520 Solid Silver......80@75c
50 Star......50c
150 Summit......1.65
100 South Standard......10c
160 Tioga Con......1¼@1½
1410 Trojan......50c
130 Union Con......57½@58¼
300 Utah......14½@15
100 University......1
1935 Ward......70c
200 Wells-Fargo......20c
2220 Yellow Jacket....19¾@20

Monday A.M., Jan. 13.
650 Alta......7
170 Alpha......12¾@12⅞
1440 Best & Belcher....22@23½
400 Baltimore Con......1¾@2
125 Belcher......4¾@4.65
890 Bullion......7¼@7⅞
140 Benton......4½@4¾
630 California......11¼
470 Con Virginia......7¾@7¼
490 Crown Point......5⅝@5½
1290 Con Imperial......90@85c
100 Con Washoe......2.10
65 Chollar......45½
440 Challenge......2½@2¾
465 Caledonia.....3.15@3.05
365 Confidence......13½@13¾
840 Exchequer......5½@5
100 Flowery......40c
1900 Gould & Curry...13¾@13¾
200 Hale & Nor......14¾@15
705 Justice......4.10@3.90
500 Julia......3½@3.40
485 Kentuck......5@5½
590 Lady Bryan......55@60c
650 Leviathan......55@50c
565 Lady Wash......1.20
910 Mexican......30½
100 Morning Star......3
110 North Con Vir......6@5¾
750 N Bonanza......1½@1.60
400 New York......70c
155 Ophir......32½@32¼
615 Overman......10⅞@11
50 Occidental......1
1300 Phil Sheridan......45@50c
2000 Solid Silver......80@75c
475 Savage......13¼
475 Sierra Nevada......45@44¾
630 Silver Hill.....1.60@1.70
100 St Louis......50c
350 Succor......45c
50 Trojan......50c
100 Utah......15@14¾
105 Union Con......58@57¾
100 Wells Fargo......20c
850 Ward......65@70c
100 Woodville......20c
1185 Yellow Jacket....18@18½

AFTERNOON SESSION.
240 Argenta......1.20@1¼
350 Belmont......60c
550 Bodie......8½@9
380 Booker......35c
25 C Pacific......1.80
1000 Chieftain......10c
100 Day......25c
1330 Eureka Con......30½@26¾
100 Endowment......30c
1685 Grand Prize......5@4.95
340 Goodshaw......35@30c
400 Hamburg......1½@1½
300 Highbridge......2.05@2
370 Independence..1.10@1.15
20 Leeds......1.10
130 Manhattan......4
30 Mono......2.20
110 Modoc......50c
500 McClinton......40c
260 Martin White......4
435 Northern Belle.....8@8½
380 Navajo......40c
470 Oriental......60c
515 Paradise......4
300 Richer......75c
130 Tiptop......1
2000 Tuscarora......5c
480 Tioga Con......1.60@1½

Tuesday A.M., Jan. 14.
125 Alpha......12¾@12¼
215 Alta......8@7¾
300 Baltimore Con......2
1460 Best & Belcher...23¾@24¼
240 Belcher......4¾@4.65
1450 Bullion......8½@8
230 California......10¾@10⅝
370 Caledonia......3.20@3¼
535 Con Virginia......8@8⅛
1205 Con Imperial......90@85c
70 Chollar......48
905 Crown Point......5¾@5½
480 Confidence......13@12¾
1235 Challenge......2¼@2¾
1080 Exchequer......5⅜@5½
1805 Gould & Curry....15@16½
615 H & Norcross......15¾
480 Justice......4¼@4.35
1500 Julia......3½@3.55
275 Kentuck......4.95@4.85
900 Lady Bryan......70@60c
520 Lady Wash......1.20@1½
740 Mexican......32¼@32¾
425 Ophir......34¾@34
935 Overman......11¼@11¾
2450 Phil Sheridan....40@45c
830 Sierra Nevada....53¼@56
445 Savage......13¾@14⅝
10 Seg Belcher......20
825 Silver Hill......1¾
300 Succor......50c
470 Utah......20@21
675 Union Con......60½@63
310 Woodville......20@25c
700 Yellow Jacket......19¼

AFTERNOON SESSION.
50 Andes......50c
180 Argenta......1.05@1
25 Bulwer......14
210 Bodie......8½
150 Booker......40c
130 Belmont......50c
1300 Benton......4¾@4.90
200 Champion......10c
140 C Pacific......1.70@1.80
600 Dudley......1
100 Day......25c
50 Endowment......35c
570 Eureka Con......27½@27¼
700 Flowery......40@50c
910 Grand Prize......4½
65 Hamburg......1¼
420 Highbridge....1.90@2.05
125 Hillside......2¼
300 Independence..1.15@1.20
225 Leeds......1
300 Leviathan......55@50c
170 Mono......2
40 Manhattan......4@3.90
120 Morning Star......3¼
1910 N Bonanza......1⅝@1.70
475 North Con Vir......6¼@7
145 Northern Belle......8
250 Navajo......40@35c
730 Oriental......55c
650 Paradise......2½@2¾
510 Raymond & Ely......8@7
100 Sitting Bull......40c
650 Summit......1¾@2
50 Star......50c
2130 Solid Silver......80@90c
250 St Louis......30c
200 S Sierra Nevada......5c
100 Scorpion......55c
700 Trojan......60@50c
2250 Tuscarora......5@10c
50 Tiptop......1.20
440 Tioga Con......1¼@1½
500 University......1
1350 Wells-Fargo......20c
1080 Ward......70c

Wed'sday A.M., Jan. 15.
290 Alpha......12½@12⅞
595 Alta......8@7⅞
1010 B & B......24½@24
1620 Bullion......8½@8¼
1215 Belcher......4¾@4.60
350 Baltimore Con......2
90 Chollar......52@51
1245 Con Virginia......8½@8⅜
225 California......11⅛
850 Crown Point......5¾
540 Caledonia......3¼@3.10
3060 Con Imperial......95c@1
645 Confidence......14@13½
855 Challenge......2½@2.95
200 Dardanelles......1.30
1395 Exchequer......5⅜@5½
2180 Gould & Curry....16½@16
1725 Hale & Nor......18@20
825 Justice......4¾@4½
2660 Julia......3.85@3.80
870 Kentuck......5¼@5⅜
410 Lady Bryan......75@65c
630 Mexican......34@33½
400 New York......70@75c
1190 Overman......12¼@11⅞
645 Ophir......35@36¼
470 Succor......30@35c
940 Savage......15@15½
445 S Nevada......56@55
790 Silver Hill......1¾@1.65
10 Seg Belcher......21
530 Utah......22@21
465 Union......62@63
1800 Yellow Jacket....19¾@20

AFTERNOON SESSION.
8825 Argenta......50@80c
345 Albion......50@60c
20 Andes......55c
305 Benton......4¾@4.65
300 Belmont......50c
160 Bulwer......15
500 Belle Isle......20c
200 Booker......40c
270 Bodie......8¾@9
50 Black Hawk......60c
30 C Pacific......1.80
1140 Dudley......1@1.05
275 Day......25c
475 Eureka Con......28¾@28¼
280 Flowery......50c
2025 Grand Prize......4¼@4
110 Goodshaw......30c
120 Hillside......2¼@2
1400 Highbridge......1⅞@1.90
1370 Independence .1.20@1.30
100 Leeds......1.05
90 Lady Wash......1¼@1½
670 Leviathan......50c
200 Modoc......50c
300 Manhattan.....3.35@3.45
110 McClinton......25@40c
110 Mono......2¼@2.15
150 Morning Star......3¼
130 N Con Virginia....7¾@7⅞
820 N Bonanza......1¾@1.65
55 Northern Belle.....7¾@8
850 Navajo......40@35c
350 Oriental......50c
1260 Paradise......2.60@2¾
1005 Phil Sheridan.....50@40c
10 Raymond & Ely......8½
300 Summit......2@2¼
175 Star......50c
300 Sitting Bull......45c
2750 Solid Silver......95@80c
975 Scorpion......1.60@1½
150 Tuscarora......5c
700 Tioga Con......1½
100 Tiptop......1.15
850 Trojan......50c
50 University......1
50 Woodville......30c
700 Wells-Fargo......20c
1410 Ward......75@80c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Jan. 9.
405 Alta......5½@5¾
220 Alpha......12@11½
985 Best & Belcher..20½@21½
1535 Bullion......7¼@7⅝
350 Belcher......4.10@4.15
400 Benton......3¾@3.90
1275 Caledonia......2½@2.60
860 Con Imperial......85@80c
285 California......10¾@10⅝
835 Challenge......1.90@2
1285 Con Virginia......8½@8⅝
160 Confidence......9¾@10½
90 Chollar......45
240 Crown Point...3.80@3.90
300 Dardenelles......1.15
1105 Exchequer......5@5½
400 Flowery......50@40c
1225 Gould & Curry...11@11⅝
485 Hale & Nor......14¾
245 Justice......4.15@4¼
1595 Julia......3½@3.70
275 Kentuck......4
515 Lady Wash......1.20@1¼
320 L Bryan......75@70c
650 Leviathan......60@65c
85 Mexican......30½@30¾
150 Mides......50c
100 Morning Star......3
100 New York......70c
230 N Con Virginia......6@6¼
815 N Bonanza......1½@1.45
165 Ophir......34@33¾
100 Overman......9½
100 Occidental......70c
260 Sierra Nevada......43
325 Savage......13½@13¾
10 Seg Belcher......20
1330 Silver Hill......2@1.55
100 Succor......30c
680 Solid Silver......50c
1020 Trojan......50c
65 Utah......13¾@13⅝
360 Wells-Fargo......20@15c
750 Ward......75@80c
300 Yellow Jacket....16@16½

AFTERNOON SESSION.
2475 Argenta......1.30@1.60
300 Belmont......55c
125 Belvidere......50c
100 Belle Isle......15c
340 Bodie......8¾
50 Black Hawk......25c
20 Booker......40c
10 Bulwer......14½
100 Bechtel......65c
170 C Pacific......1¾@1.80
200 Dudley......75c
640 Eureka Con......31½
485 Grand Prize......5¼@5¾
350 Goodshaw......35@30c
600 Highbridge......1¾@2
50 Hillside......2.10
510 Independence......1.05
90 Jackson......8
325 Modoc......50c
430 Martin White....3.90@4
80 Mono......2½
25 McClinton......40c
225 Northern Belle.....8@8½
50 Navajo......45c
300 Oriental......75c
600 Paradise......2.20
10 Raymond & Ely......6½
300 Summit......1.60
300 Star......50c
225 Tioga......1¼
500 Tuscarora......5c
300 University......1

Thursd'y A. M., Jan. 16.
205 Alpha......12¼@12½
1105 Alta......6⅞@7½
100 Andes......60c
395 Best & Belcher...22¼@22½
700 Belcher......4¾@4.80
905 Bullion......8½@8⅝
205 Benton......4.10@4¼
700 Baltimore Con......1½@2¼
755 California......9¾@9⅝
650 Con Virginia......7¾@8
690 Crown Point......5¼@5⅝
80 Chollar......49@50
4010 Con Imperial......90@95c
230 Confidence......13⅞@14
780 Caledonia......3.05@3.10
675 Challenge......2¾@2.80
700 Exchequer......5½@5¼
10 Flowery......50c
800 Gould & Curry....15@15½
440 Hale & Nor......17½@18
510 Justice......4.35@4.45
1700 Julia......3.70@3.80
655 Kentuck......5¾
120 Lady Wash......1¼@1.30
410 Lady Bryan......70c
500 Leviathan......50@55c
445 Mexican......33½@33⅞
525 New York......70@75c
160 North Con Vir......7¼
80 Ophir......34¾
1045 Overman......11½@11¼
975 Phil Sheridan...1¼@1.45
585 Sierra Nevada....51¼@53
1365 Savage......15@15¼
440 Succor......20@30c
750 Silver Hill......1.60
850 Solid Silver......1@1.10
300 Trojan......50c
575 Union Con......60@61½
190 Utah......18@18¾
450 Ward......75c
50 Woodville......30c
235 Yellow Jacket...19¾@19⅛

AFTERNOON SESSION.
5200 Argenta......60@70c
90 Bulwer......15
1110 Bodie......8¼@8½
50 Bechtel......1
150 Belmont......50c
300 Belle Isle......20c
975 Booker......30@35c
20 Belvidere......60c
20 Black Hawk......60c
750 Chieftain......10c
290 Caledonia (B H)..1@1.15
1140 Dudley......1.05@1¼
410 Eureka Con......28¾@29
300 Endowment......30c
400 Gila......20c
950 Goodshaw......35@30c
3820 Grand Prize...3.95@4.10
500 Highbridge......1¾
500 Hillside......2.10@2¼
1900 Independence..1.35@1.40
50 Jackson......7½
300 Leeds......1
315 Manhattan......3½@3¾
315 Modoc......50@55c
100 McClinton......30c
220 Navajo......35c
110 Northern Belle....7½@7⅝
655 Oriental......50@75c
525 Paradise......2.60@2.70
360 Raymond & Ely...7¾@8½
1060 Summit......2¼@2½
2700 Star......50@60c
1300 Tuscarora......5c
400 Tioga Con......1¼@1.30
210 Tiptop......1

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	13	1 00	Dec 10	Jan 13	Jan 31	W H Watson	302 Montgomery st
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belmont M Co	Nevada	19	50	Nov 27	Jan 3	Jan 27	J W Pew	310 Pine st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Benton Con M Co	Nevada	1	50	Dec 11	Jan 15	Feb 3	W H Watson	302 Montgomery st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Bullion M Co	Nevada	8	1 00	Dec 3	Jan 7	Jan 29	Joseph Gruss	418 California st
Crown Point G & S M Co	Nevada	36	1 00	Dec 12	Jan 16	Feb 6	James Newlands	203 Bush st
Endowment M Co	Nevada	2	25	Nov 21	Dec 30	Jan 21	R H Brown	327 Pine st
Equitable T & M Co	Utah	19	05	Nov 7	Jan 2	Jan 21	S Healy	45 Merchant's Ex
Hale & Norcross S M Co	Nevada	60	50	Dec 10	Jan 15	Feb 7	J F Lightner	58 Nevada Block
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Mono M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	V H Lent	309 Montgomery st
North Bonanza M Co	Nevada	1	50	Dec 6	Jan 10	Jan 28	V W Stetson	309 Montgomery st
North Con Virginia M Co	Nevada	14	1 00	Nov 21	Dec 27	Jan 17	C C Pratt	309 Montgomery st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Feb 3	Mar 3	J L Fields	240 Montgomery st
Savage M Co	Nevada	36	1 00	Dec 4	Jan 7	Jan 27	J B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	C R Spinney	310 Pine st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	V E Dean	203 Bush st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 24	Feb 13	W H Lent	327 Pine st
Vermont Con M Co	Nevada	2	15	Dec 7	Jan 9	Jan 29	S F Stone	306 Pine st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance M Co	California	2	50	Dec 13	Jan 28	Feb 21	B Lengley	309 California st
Arizona S M Co	Nevada	4	1 00	Dec 9	Jan 13	Feb 3	W Willis	309 Montgomery st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Jan 28	B S Kellogg	306 Pine st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Catawba M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Colorado River C & G M Co	Arizona	3	50	Nov 29	Jan 2	Jan 18	H A Whiting	211 Sansome st
Eagle S M & M Co	Nevada	11	10	Nov 30	Jan 7	Jan 28	R H Brown	327 Pine st
Hazard Gravel M Co	California	2	06	Dec 9	Jan 8	Jan 24	J T McGeogbeban	318 Pine st
Lodi M Co	Nevada	1	25	Nov 20	Jan 7	Jan 27	O J Humphrey	328 Montgomery st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	318 Pine st
Mariposa Land & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower M Co	California	2	15	Dec 7	Jan 4	Feb 4	J Morizio	328 Montgomery st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	24 Safe Deposit Build
Mineral Fork M & S Co	Utah	1	02	Oct 31	Dec 7	Jan 30	Otto Metchke	328 Montgomery st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 5	J Penteeost	511 California st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
Orion M Co	California	4	25	Dec 12	Jan 13	Jan 28	P Conklin	28 Sansome st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
Queen Bee M Co	California	1	25	Dec 2	Jan 6	Jan 27	T A White	113 Leidesdorff st
Summit M Co	California	6	05	Nov 19	Jan 6	Feb 4	J W Clark	318 Pine st
Summit G M Go	California	1	50	Nov 27	Jan 6	Jan 28	W H Lent	327 Pine st
Tiger M Co	Arizona	2	1 00	Oct 21	Dec 10	Jan 20	W H Lent	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Aurora Tunnel M Co	Nevada	C V Hubbard	Cosmopolitan Hotel	Annual	Jan 20
Belcher M Co	Washoe	Jno Crockett	203 Bush st	Annual	Jan 28
Jefferson M Co	Nevada	C A Sankey	331 Montgomery st	Annual	Jan 23
Kossuth M Co	Nevada	E F Stone	306 Pine st	Annual	Jan 20
Natoma W & M Co		H P Livermore	531 Market st	Annual	Jan 21
Oriental Con M Co	California	H C Hinman	327 Pine st	Annual	Jan 21
Pacific M Co	California	R N Van Brunt	318 Pine st	Annual	Jan 23
Raymond & Ely M Co	Nevada	J W Pew	310 Pine st	Special	Jan 28
Raymond & Ely S M Co	Nevada	J W Pew	310 Pine st	Annual	Jan 28
Twin Peaks M Co	Nevada	T W Colburn	414 California st	Annual	Jan 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Jan 13

Pacific Board—Latest Sales.

Wed'sday A.M., Jan. 15.
80 Alpha......13
20 Alta......8½
560 Belcher......4⅝@4¾
155 Best & Belcher...24¾@24⅝
345 Bullion......8¾
125 Con Virginia......8½@8⅝
130 Con Imperial......97@98c
210 Crown Point...5.65@5.60
110 California......11¼
60 Chollar......54
225 Exchequer......5.40@5¾
220 Gould & Curry......16¾
185 Hale & Nor......19½@19¾
145 Justice......4.60@4.55
140 Kentuck......5¼
250 Mexican......33¾@33⅝
200 Ophir......36@36½
30 Overman......11⅞
40 Savage......15¾@15⅝
110 Sierra Nevada....55@54¾
530 Silver Hill......1.70@1⅝
20 Union Con......62
220 Yellow Jacket....20@20¼

AFTERNOON SESSION.
60 Alta......8@8½
2620 Argenta......90@55c
90 Alpha......13½
10 Belcher......4¾
260 Benton......4.80@4.70
130 Bullion......8¼
40 Crown Point......5.65
25 California......11
10 Con Virginia......8½
300 Con Imperial......95c
200 Caledonia......3¼
20 Exchequer......5¼
10 Eureka Con......25
10 Grand Prize......4½
50 Gould & Curry......16
300 Golden Chart......10c
100 Hale & Nor......19
90 Justice......4.65@4.60
250 Julia......3.90@3.95
245 Lady Wash......1⅝@1¼
100 Mackey......1¼
35 Mexican......34@33½
200 N Sierra Neda......3c
125 N Bonanza......1¾@1⅝
140 New York......70c
120 Overman......11¾@11⅝
260 Phil Sherid......50c
50 Prospect......20c
200 San Pedro......1.10
700 S Utah......20@10c
20 Savage......16
20 Sierra Nevada......54½
30 Silver Hill......1.70
150 Trojan......49@50c
5 Utah......20
820 Ward......80c
50 Wells-Fargo......20c
160 Yellow Jacket...19¾@20⅜

Californi Board—Latest Sales.

Wed'sday A.M., Jan. 15.
50 Alpha......13@13½
40 Alta......8½
150 Atlantic......70c
2000 Ætna......8c
500 Atlas......12½c
100 Atlanta......7c
65 Best & Belcer...24@24½
60 Belcher......4⅝@4.70
50 Bullion......8@8½
85 California......11@11½
50 Chollar......48
90 Con Virgin......8¼@8½
750 Con Imperi......95@97c
60 Crown Point...5.40@5½
170 Caledonia......3¼@3.30
400 Enterprise......1@1½
70 Exchequer......5½@5⅝
70 Gould & Cur...15⅝@15½
300 Globe......3c
50 Hale & Noross......17¾
70 Justice......4.60@4½
150 Julia......3.60@3.65
5 Kentuck......6
40 Mexican......33
1700 N Sierra Neda....4@3c
300 North Carso......21c
65 Ophir......34½@34⅝
300 Phil Sherids......50c
65 Savage......14¼@14⅜
300 S Europa......95c
150 Senator......25c
110 Silver Hill......1.70
310 Santiago......1@1½
300 Trojan......50c
500 U Flag......2c
50 Union......61@61¾
220 Ward......70c
55 Yellow Jacket...19¼@20

AFTERNOON SESSION.
60 Alexander......11@10¾
1800 Atlanta......5@4c
1100 Atlas......12½c
120 Almaden Q......1¼
60 Alta......8@8½
130 Andes......60c
75 Argenta......1.05
100 Bullion......8¼@8½
60 Best & Belcher...24¼@24⅝
90 Belcher......4⅝@4.70
60 Con Virginia......8¾@8½
40 Crown Point......5⅝
250 Con Imperial......95c
50 California......11¼@11
130 Challenge......1½
40 Chollar......53
175 Caledonia......3¼@3.10
300 Coso Con......5c
50 Exchequer......5¼@5⅝
120 Gould & Curry...16½@16
70 Hale & Nor......19¾@19⅞
80 Julia......4¼@3.95
90 Justice......4.70@4¾
40 Mexican......34
1000 Monumental......4c
350 N Monumental......3c
40 Ophir......36½
30 Savage......16¼
20 Sierra Nevada......56
100 Trojan......50c
50 Union Con......62½@63
100 Ward......75c
50 Yellow Jacket......20

Ellion Shipments.

Since our la issue shipments of hullion have been as follow: Raymond &Ely, Jan. 7th, $6,193; Highbridge, Jan. 1(h, $10,055; Grand Prize, Jan. 13th, $23,000; orthern Belle, Jan. 8th, $3,527; Jan. 11th, $5,C4; Standard, Jan. 9th, $14,774; Eagle, Jan. 7th$9,261; Tybo, Jan. 10th, $3,827; total 187 $746,552; Hillside, Jan. 14th, $6,700; MartinVhite, Jan. 8th, $11,070; Star Mine, Jan. 13tl $7,500; Con. Virginia, Jan. $28,000; Leed Jan. 11th, $3,549; Indian Queen, Jan. 6th$4,868.

Mining Share Market.

The mining share market during the past week has been without special features with regard to fluctuations in price. The brokers have, however, had plenty to talk about. In the first place, both "bucket shops," as the public stock exchanges were called, have closed up. We have before referred to these institutions, and it is a matter of congratulation to know they have passed out of existence.

The meetings of California, Con. Virginia and Sierra Nevada, were held this week and the annual reports read. California and Con. Virginia, elected the old officers. Sierra Nevada, elected John Skae (President), C. H. Fish, W. S. Lyle, Geo. Congdon and R. N. Graves, as Trustees. The California mine produced last year $10,949,078, and paid out in dividends, the sum of $7,620,000. The total receipts and expenditures were $11,246,539.

Business is improving somewhat in the boards. The sales of the San Francisco stock board from January 8th to 14th, aggregated $1,480,000.

Our usual weekly summary of news from the Comstock, failed to come to hand this week for some unexplained reason, and we are therefore compelled to go to press without it.

News in Brief.

THERE is about 15 inches of snow at Tahoe City.

SIX United States prisoners escaped from the jail at Prescott, A. T.

THE French government proposes to pardon all Communists, except 400 ringleaders.

WILL S. FENTON, a soldier, was found frozen to death Saturday, near Salt Lake.

THE British ship *Allegiance* has gone ashore at the mouth of the Columbia river.

THE production of pig iron in the United States during 1878 was 2,382,000 tons.

THE Belcher is now claimed to be the deepest mine in America, having a depth of 2,640 feet.

LANDS on Salt river, in Arizona, have been set apart for a reservation of the Pima and Maricopa Indians.

HENRY THOMAS was shot and killed by Jack Epperson, Thursday night, at Geyserville, Sonoma county.

AN accident occurred at the Con. Virginia mine Saturday morning, causing damage to the amount of $10,000.

MADAME ANDERSON has completed her task of walking 2,700 quarter miles in as many quarter hours at Brooklyn, N. Y.

THE Indians White Owl and Quit-Ti-Tumps were executed recently at Pendleton, Or., for the murder of George Coggan.

THE Military Court of Inquiry into the responsibility of Major Reno for the Custer massacre, is in session at Chicago.

A DESPERATE affray has occurred at Piedras Negras, Mexico, in which one Mexican officer was killed and another badly wounded.

AT last accounts, 40 of the Cheyennes who escaped from Fort Robinson had been killed, 15 wounded and 40 to 50 recaptured.

ARRANGEMENTS have been made to extend the Utah Southern Railroad from York to 'Frisco, a distance of 155 miles.

THE first water ever pumped into the Sutro tunnel was sent through Sunday by the pumps at the Chollar-Norcross-Savage shaft.

J. WILLIAMS of Roseburg, while at a party at Looking Glass, lost his speech, and has only been able to converse since, at great intervals.

THE overland stages from Eureka, Humboldt county, to San Francisco, have ceased running for the winter. The mail is now carried on horseback.

ORANGE trees raised in Sacramento from the seed appear to stand cold weather quite well, but those imported from the south have suffered in the loss of their foliage, and present a great contrast to the Sacramento raised trees.

FOLLOWING is a statement of the number of flasks of quicksilver shipped by the several mines named, during the past year: Sulphur Bank mine, 9,448; Great Western mine, 5,027; Napa Consolidated mine 3,050; American mine, 119. The total in pounds is 1,359,940½.

THE track of the Southern Pacific railroad is laid to a point 38 miles east of the Colorado river, and is progressing at the rate of a mile and a half daily. Grading is completed 10 miles beyond the end of the track.

THE NORTH AMERICAN REVIEW.—Friends of good, solid literature will be pleased to hear of the continued prosperity of the veteran publication, the *North American Review*. After 63 years' existence as a quarterly and bi-monthly, the *Review*, with the January number, commenced life anew by becoming a monthly. This change will produce a much greater degree of timeliness in the treatment of topics, and will add largely to the amount of matter presented in a year. The managers state that they have secured as contributors for the coming year the most eminent statesmen, scholars, *literateurs*, and men of science, on both sides of the Atlantic. In addition to articles on political, literary and other themes, the January *Review* contains an essay on the preservation of forests, by Felix L. Oswald, which will be read with interest. The *North American Review* is published by D. Appleton & Co., 551 Broadway, New York.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

I X L AND EXCHEQUER.—Bodie *Chronicle*, Jan. 4: Lewis Chalmers returned to this town several weeks ago, and now has a boarding house started at the I X L mill, and eight or ten men employed building a bridge across Silver creek, between the I X L and Exchequer, and grading a road and place for building at the mouth of the tunnel just back and a little below the I X L.

TARSHISH.—The Tarshish, at Monitor, will start up again under the name of Colorado No. 2 Gold & Silver mining company, with the following well-known gentlemen as Directors: Judge Theron Reed, of Kern county, B. E. Hunter, Judge Griffith, Treasurer Cronkite and Supervisor Merrill, all of Alpine county. The capital of the new company is $4,000,000, in 40,000 shares.

INYO.

FROM BENTON.—"Saxs," in the Inyo *Independent*, Jan. 4: Mr. J. H. Badger recently returned from San Francisco, where he had made an amicable settlement with the defunct Comanche M. & M. Co., and states that if a settlement can be accomplished with all the creditors that the company will soon resume operations, and Benton will be itself once more. The Diana mill has been crushing some very rich ore from the Laura and Modock mines. The Mammoth M. & M. Co., at Lake district, under the superintendency of Jim Cross, is running the mill to its full capacity, with very satisfactory results and without sorting the ore. Supt. Adams, of the Indian Queen, announces his intention to provide the bullion for another dividend on the first of the coming month, or soon thereafter. Morris Burke lately returned from San Francisco, where he incorporated the East Mammoth mine. Mr. P. W. Bennett was here last week. He and L. E. Tubbs have taken numerous claims and filed many liens for laboring men on the Comanche property, of which they propose to collect 100% on the dollar.

LAKE DISTRICT.—Esmeralda *Herald*, Jan. 4: Several parties are now in town from Lake district, having come in to spend the winter. They report about 40 men employed at and around the Mammoth mine and mill—the latter running day and night.

LORD BYRON.—Parties who have been doing assessment work on the Lord Byron mine, on Last Chance hill, struck some rich rock last Thursday. The shaft of the Lord Byron is down 40 feet, and it was in the bottom the strike was made. Some of the rock shows free gold abundantly.

MONTEREY.

COAL.—Monterey *Californian:* The building of the Carmelo railroad from the coal mine to Strader's landing has been commenced, and its early completion is now an absolute certainty. We were informed recently that another very large and promising vein of coal had been found in the immediate vicinity of the tunnel. Mr. Dougine has entire charge of the company's property, including the building of the railroad. The Mal Paso tunnel, in the Mal Paso canyon, is to be continued for a depth of 2,000 feet, which will be the means of tapping and draining all of the three veins now being worked at the Carmelo coal mine. The tunnel at present worked by the company is also to be connected with the railroad by means of a tramway, which will be 3,700 feet long. The railroad when finished will be a little over four miles in length—a three-foot gauge.

MONO.

BODIE.—Inyo *Independent*, Jan. 4: Prospecting is about suspended for the season, so that the many little wild-cat locations wedged in and around claims of real merit may preserve their reputations for the time being. The new field that will attract attention is in the vicinity of the placer diggings at Dogtown. That point is undoubtedly a break or the tail end of the rich mineral belt of Bodie.

NAPA.

QUICKSILVER.—Cor. Napa *Register*, Jan. 11: The Napa Consolidated mine, better known as the Oat Hill mine, is situated in Napa county about 10 miles southeast of Middletown. Thirty men are employed, 20 of whom are Chinamen. These latter do all the underground work. The minimum product of the mine is 300 flasks of quicksilver per month, 76 lbs each. M. G. Rhodes is the superintendent. The entrance is by a perpendicular shaft. In company with the foreman, Mr. Partrigan, I got into the iron cage, and the steam engine let us down to the 400 level. Good working ore gives about two per cent. of quicksilver. The best sometimes runs as high as 12%. The furnaces and retorts of this mine are not equal to the task of reducing all the ore which might be produced, so a small force of men is employed. The Great Western mine is situated north of Mt. St. Helena, and about three and one-half miles southwest of Middletown. The tunnels are run straight into the side of the mountain, and trains of small cars, each drawn by a horse with a lantern on his breast, carry out the ore 2,200 feet. The tunnels and caverns are here much more capacious, and the temperature lower than the former mine. Two hundred men are employed —180 of them Chinamen. Work never ceases at the mines, but is prosecuted night and day, Sundays and Christmas. The Great Western turns out about 500 flasks of quicksilver per month. The furnaces, retorts and condensers are all of the improved patterns. Two little streams of mercury as large as goose quills come out in jets, representing the result of the entire labor of the mine. It seems ridiculously small, but it counts.

NEVADA.

GRASS VALLEY DISTRICT. — Grass Valley *Union*, Jan. 10: Taken altogether the year 1878 has been a good one for quartz mining in the Grass Valley district. It has witnessed a renewed interest in that character of mining, and during the time several new enterprises have been inaugurated, or old organizations remodeled, that are getting fairly upon their feet as remunerative properties. And during the present year they should pay back to their owners compensation for their investments, as a reward for their pluck and confidence in the resources of the district. A large amount of money was paid out in 1878, in the way of assessments to carry on these enterprises, and principally from our own citizens. Prospecting, which generally succumbs to the rains that saturate the ground, has continued without interruption, and by that means many miners in the district have been enabled to continue regular work, who otherwise would have been compelled to be idle or at best put in but broken time. In consequence of this the custom mills have been kept constantly busy, which is unusual for the winter season. While the elements have thus favored quartz mining, they have been unpropitious to the greater and more important gravel mining interest and for the agriculturists, and make enforced idleness in gravel mining that is discouraging to those whose capital and labor is locked up in such investments; and the winter is now so well advanced that none can hope for a water supply that will give the usual complement of a good season.

IDAHO MINE.—The new shaft, below the 10th level, is now down 132 feet, having been sunk 20 feet during the month. The yield of the mine for December was $64,000, an increase of $7,000 over the previous month. The regular monthly dividend (No. 113) of $7.50 per share, amounting to $23,250, was declared on Monday, payable immediately. This is a large dividend, when taking into consideration the necessary payment of the annual taxes and other large outlays outside of the regular working expenses. With the payment of the above dividend the entire amount of dividends paid by the mine is $2,557,500.

CENTENNIAL.—The 3d or 420 level, is being driven north and south, and opens out finely. Of late the company have been doing considerable dead work, preparing the mine for greater production of rock than heretofore. The tributers of late have been taking out very fine rock, and will make first-class wages.

MT. ZION GRAVEL.—Nevada *Transcript*, Jan. 10: A San Francisco company have recently purchased the Mount Zion gravel claims which have been owned and worked by the "George boys" and others for nearly 20 years past. It is one of the oldest pieces of property in the county, and is situated on the ridge road between Eureka and Bloomfield, about seven or eight miles above the latter place. The claim, which is a very large one, fronts on the South Yuba, and extends back to the center of the ridge. A tunnel 1,800 in length has been run in it by the former owners.

EUREKA GRAVEL.—The Eureka Gravel mining company, at Relief Hill, has been paying dividends for eight years past, the claim being good for from $5 to $16 per day for each man working in it. The proprietors consist of a number of Americans, Germans and Danes. John Hickman, one of the owners, has held the position of foreman ever since pay dirt was first struck.

BLUE BANKS.— Nevada City *Herald*, Jan. 7: W. F. Cummings, the banker at Moore's Flat, brought down $30,000 in gold dust from that place on Sunday last. This was obtained from the clean-ups of the Blue Banks and other claims in the vicinity made last week.

SANTA BARBARA.

LEAD AND SILVER ORE.—Lompoc *Record*, Jan. 4: Considerable excitement prevailed for a time last Thursday morning, over the display of a rich specimen of lead ore, containing a quantity of silver, reported to have been *first* found on the Lompoc rancho by Dr. H. C. Dimock. The locality of the discovery is yet unknown, except to the discoverer. An interview with the Doctor elicited the statement that he first discovered the ore while prospecting with a friend, which he is willing to testify to under oath. He further thinks that this section, to-day, is richer in mines, chrome not excepted, than San Luis. Messrs. Sirrine and Anglin are still working up the Bear creek mines, and we may expect to learn something ere long. Specimens from the Dimock and other mines may be seen at this office.

SHASTA.

COPPER CITY.—The Extra company keep up their lick day and night, and the regularity with which they ship the silver bricks is the best proof of what is being done, also of the ore produced from our mines. At the Potter mine the deeper they sink the larger they find the ledge, which carries its rich ore with most remarkable uniformity from top to bottom of main shaft. This mine has more good ore in sight than the mill can reduce in the next 12 months. At the Bully Hill South or No. 2, they have a five-foot vein of good milling ore, which resembles very closely that of the Potter mine. There are three claims on this one vein for a distance of over 4,000 feet, with ore exactly alike in all of them, showing this vein to be an immense bonanza, with ore enough to run 100 stamps. The Winthrop company are driving their tunnel day and night. They have encountered very hard rock. The new tramway is being pushed along at a lively rate, and will be completed to Bully Hill in a few weeks, when the expense of hauling ore will be reduced nearly $75 per day. It looks very gay to the old residents of Copper City to see a train of cars come spinning down the mountain from Bully Hill to the company's mill.

AFTERTHOUGHT MILL.—Reading *Independent*, Dec. 26: At the Afterthought mill, upon the the success of which everything depends, we had the pleasure of meeting Mr. Campbell, the Superintendent; A. J. Loomis, Dan Feit, who is superintending the construction of the mill, and D. J. O'Harra, the inventor of the process by which the ore is worked. The mill, when completed, will be one of the best and most convenient ever put up in any mine. Their machinery will all be run by water power, which will be a saving of money.

PECK MINE AND COPPER CITY.—In company with Superintendent Campbell and Mr. O'Harra we visited the Peck mine, lately purchased by them from another company. It is located so conveniently to the mill that if the company desire to do so, a chute could be made to carry the ore right into the mill; but for the present they intend to haul the ore, and for that purpose have constructed a fine wagon road. The value of the ore varies, say from almost nothing, in the way of silver and gold, to $40 and even $80 per ton, while that which carries but little in these metals is rich in copper. Practical miners talk about this as an enormous ledge. This mining district is, without a doubt, a continuation of the ore at Copper City, and as the bullion already shipped from the latter place shows that it pays, the mines on North Cow creek must also pay.

SOUTH FORK DISTRICT.—The new mill is in fine running order, with its concentrators, roasters, pans and settlers, all doing their part night and day, and turning out the bullion in good shape, under the constant supervision of Mr. Peck, one of its owners. The latest discovery of the country is giving new life to this whole section: O. Engle is the lucky man; a two-foot ledge widens out to ten feet in thickness a little lower down the hill, and still other fine claims are being opened above this by W. Brummett and others.

NEVADA.

WASHOE DISTRICT.

Our usual weekly summary of Washoe mining news having failed to come to hand, we take the following from the letters of Superintendents, on file in the offices of the respective companies mentioned:

CHOLLAR.—Letter of the 11th says: During the past week we have eased and repaired 28 feet of the C. N. S. shaft. Have timbered 15 feet at north end of 1593 level and finished putting in pipe to convey water to the Sutro tunnel. The pump shaft has been cleaned down and pump work completed, and the pumps are now ready to start up. On Thursday we broke the rope in south hoisting shaft and to-day are putting in new ropes. Shall have everything running again to-night.

OVERMAN.—Letter of the 11th says: During the past week the north crosscut has been extended 28 feet and the north lateral drift 20 feet, and the face is in quartz showing a little metal. The excavation for machinery for vertical winze is about completed, and we will commence putting machinery in place by Monday. The new shaft has been sunk and timbered 30 feet. The ground continues very hard with a little seepage of water.

OPHIR.—Letter of the 11th says: Ship this day five bars of bullion, Nos. 19 to 23, value, $19,459.46.

BEST & BELCHER.—Letter of 12th says: The joint east drift, 1700 level was advanced 58 feet during the week, and is now in 300 feet from the lateral drift. Joint east crosscut 1900 level was run 26 feet through hard porphyry, and the vertical winze from this drift sunk 10 feet. At the Osbiston shaft there has been much trouble with water, so that only 15 feet was sunk, making a total depth of 400 feet.

GOULD & CURRY.—Letter of the 12th says: Crosscuts Nos. 2, 3 and 4, 1900 level, have made slow progress during the week, for the reason that each showed signs of water, and we had to stop them to ascertain the extent. I am now satisfied that it amounts to nothing, and work is resumed in all of them. Joint east drift 1700 level was advanced 58 feet and is now in 300 feet from the lateral drift; good progress will be made at this point hereafter. The repairing of the main shaft progresses well, 12 new sets having been put in place. It will require 10 sets more of new timbers to complete the work. There is still a very heavy flow of water at Osbiston shaft, but we are still sinking, having made 15 feet during the week; total depth, 400 feet.

CALEDONIA.—Letter of the 11th says: Since last report the east drift, 1600 level, has been extended 40 feet. The ground in the face is

Continued on page 44.

Continued from page 34.

42 millions of piecettes (the piecettes has sensibly the sams value as the franc), agreed to in 1870 by the house of Rothschild's, and to reimburse them for thirty annuities of 3,750,000 francs, the government conceded to them the monopoly of the sale of the products of the mines of Almaden, under the following conditions:

Ths Spanish government engages itself to deliver sach year, at least 32,000 frascos (hottles of 34.507 kilograms, or 75 Spanish pounds), that is, 1,104.224 tons. The value of the mercury furnished to the Rothschilds is fixed according to the course of metal in the English market. Ths minimum admitted is six pounds sterling (151.20 fraucs, or ahout that); if ths price of the metal should descend helow this figure, ths government would not receive less than six pounds sterling per frasco.

From six to eight pounds the profits are shared equally hetween the two contractors. Above eight pounds, the Rothschilds receivs one-third and the treasurer two-thirds.

Thus, the price of mercury heing, for example £14, the Spanish government would recsive per bottle:

1st. £6 as a minimum. 2d. £1 from ths first profit of £2. 3d. £4 from the second profit of £6, in all £11.

Thus the mercury enclosed in bottles is placed at Almaden itself in the hands of a representative of the houss of Rothschilds and the Administration, and the establishment finds itself dischargsd from all care and all expenss of selling, consequently of all operations which are little in harmony with tbe true functions of a government of any kind. The treasury profits likewise, at reasonable rate, hy any elevation of the price, an elevation which it is without douht not in condition either to produce or to maintain.

Nothing is more variable in fact than the price of mercury in the London market, supplied almost entirely hy the miues of Almaden. Idria does not produce more than 370 tons, while 1,200 comes from Spain; and America whose productiou is nearly equal to that of Almaden, consumes itself its products. This is not to say, that the production of the New World does not powerfully influence the value of mercury; one may, nevertheless, regard as certain that a notable part of the variations in the price is due to operations purely commercial. It was in fact, in 1873, 1874, 1875, very far from the old pricc of £6.

The avcrage prices in the London market have heen the following:

YEARS.	PRICES.			
	£.	sh.	d.	per frasco.
1865	7	19	4	"
1866	7	5	8	"
1867	6	17	1½	"
1868	6	17	"	"
1869	6	17	"	"
1870	7	18	8	"
1871	10	9	0¾	"
1872	11	11	2¾	"
1873	15	2	7	"
1874	21	6	10½	"
1875	14	4	0¾	"
1876	9	3	10	"
Average	10	0	5	"

The lowest pricc from 1865 to 1876, was £6 (Dec., 1865); the highest, £26, in Nov., 1874.

Let us now place in comparison to the price of selling, the complete cost of producing the ton and the frasco of mercury during the last five years. This cost results from the following tahle:

I. General State of Expenses in the five years, 1870-75.

NATURE OF EXPENSES.	1870-71	1871-72	1872-73	1873-74	1874-75
	Francs.	Francs.	Francs.	Francs.	Francs.
Personal	130,256.94	130,036.55	120,653.52	121,901.29	133,252.08
Material for offices	1,548.00	1,554.78	1,311.96	1,479.93	1,673.92
Exploitation	866,507.74	395,500.64	268,449.62	278,205.55	417,105.35
Stoping	234,320.19	83,051.70	87,250.37	103,931.48	75,201.49
Supporting	84,136.47	3,848.00	19,438.32	17,588.33	8,580.07
Drainage	223,391.99	88,929.37	29,476.32	17,497.02	21,477.53
Ventilation	4,040.00	2,366.50	29,113.66	21,571.87	16,106.05
Transportation	162,084.06	169,586.65	208,463.55	110,807.93	809.50
General expenses	85,529.09	88,929.37	85,553.08	88,220.00	
Extraction and transportation	162,084.06	169,586.65	208,463.55	110,807.93	
Distillation and boteling	330,310.54	395,500.64	268,449.62	278,205.55	
Shops	16,148.20	16,944.99	29,476.32	31,323.16	
Sundries	25,578.08	28,730.25	19,318.49	17,497.02	
Hospital and chapel	24,257.00	25,730.25	17,588.33	21,571.87	
Domain of the Castellseras	16,122.47	16,917.94	16,883.04	16,106.05	
Extra expenses	278.20	1,673.70	809.50		
Total	1,548,900.00	1,554,778.01	1,411,956.30	1,479,283.76	1,673,292.57

In consequnce of the improvements in maehinery and the increasing richuess of the mine, they can easily in a year or two, he in a condition to produce annually 40,000 frascos (1,380 tons) of nercury, at a cost which will not exceed 42.50 francs per frasco.

II. Cost of Extraction of a Ton of Mercury from 1870-75.

NATURE OF EXPENSES.	1870-71	1871-72	1872-73	1873-74	1874-75
	Francs.	Francs.	Francs.	Francs.	Francs.
Personal	109.90	111.80	104.20	125.00	106.50
Expense of office	4.20	4.40	4.20	4.20	4.20
Exploitation	309.30	334.60	308.70	335.50	293.50
Stoping	107.80	205.50	169.90	212.80	196.10
Timbering and Masonry	71.00	73.20	75.60	105.40	59.50
Drainage	3.50	3.40	2.50	2.20	1.70
Ventilation	72.70	73.90	74.00	119.70	69.80
Extraction and transportation	136.80	149.70	180.40	282.80	216.30
General expenses	325.90	348.40	223.70	285.00	239.90
Distillation and boteling	13.60	14.10	25.60	32.10	23.00
Shops	24.10	20.90	15.20	17.90	7.00
Sundries	20.90	22.00	16.70	22.10	17.00
Hospital and chapel	17.00	14.30	14.60	17.40	12.70
Domain of Castilseras	1.50	0.20	1.50	0.80	
Extra Expenses					
Total	1,307.10	1,360.80	1,222.20	1,515.40	1,323.40
Cost per frasco	45.10	47.27	42.17	52.29	45.67

Let us see also what have heen ths quantities of ore treated and of mercury produced in the same time:

Years.	Ore Treated.	Mercury Produced.		Average yield.
	Tons.	In tons.	In frascos.	Per Cent.
1870-71	15,867.039	1,185.007	34,341	7.47
1871-72	15,835.340	1,135.046	32,803	7.17
1872-73	10,094.436	1,155.280	33,479	7.18
1873-74	16,370.750	970.104	28,237	5.00
1874-75	18,815.680	1,264.355	36.640	0.72

We give in the following tahle the relative amounts of the production of the principal countries which produce mercury; one can easily get from it an exact idea of the relative importance of Almaden to the general production.*

Years.	Spain.	Austria.	Hungary.	Italy.	United States.
	Tons.	Tons.	Tons.	Tons.	Tons.
1864	1,057.6	291.1	32.4	"	1,633.6
1865	1,078.3	192.3	42.7	"	1,928.8
1866	055.0	183.5	55.7	"	1,600.3
1867	1,095.1	271.8	00.9	"	1,276.0
1868	1,014.0	236.8	42.7	"	1.170.7
1869	1,123.7	316.0	33.7	"	1,163.3
1870	1,345.3	309.0	25.0	"	1,013.5
1871	1,157.0	375 7	18.0	"	1,100.0
1872	1,232.0	333.4	15.3	55.	1,045.8
1873	"	377.1	14.0	"	986.8
1874	"	372.1	13.2	"	1,182.0
1875	"	360.7	18.0	"	1,853.1

We will finish this study of the deposits of mercury at Almaden hy a rapid exposition of their history. This retrospective view cannot but aid in a hetter comprehension of the actual situation of the mines.

*From M. Von Lindheim, *Kohle und Eisen im Welthandel*, Vienna, 1877.

To be Continued.)

OSTRICH PEPSINE.—M. Alfred Ehelot, in an article in the *Revue des Deux Mondes*, on the means employed in the Argentine Republic to protect settlers in the Pampas from the Indians, gives some curious statements with regard to ostrich pepsine. The soldiers never could resist an ostrich hunt when they saw a male ostrich, as is the custom of that hird, taking out its young hrood for food and exercise. The parent hird generally escaped, leaving its young in the hands of its enemies. Whcn other food was scarce they ate the young ostriches. Some portious of the flesh of these hirds, when young and fat, are reckoned dainty hy the Indians. Whilst eating the ostrich the Indians always carefully put aside the stomach in order to collect the pepsine whicb it contains. "The stomach of the ostrich," says M. Ehelot, "is celehrated for its incredihle powers of digestion. The abundance of pepsine, to which it owes this faculty, has created among the Indians a curious commercial fraud. They dry it and sell it literally for its weight in gold. It is used for the purpose of restoring worn-out stomachs."

The idea is too "good to he lost sight of," and we shall no douht even hear "ostrich pepsine" addcd to the innumeral number of "patent medicines," with which the world is afflicted.

A NOVEL WALL COVERING.—*Engineering* states that of late, great improvements have heen made in the preparation of wood for wall covering. The wood is cut to the thicknoss of paper, and by a peculiar process stuck on the paper, which serves as a protection against the influence of the walls on the graining and color of the wood. The delicacy of the machinery employed in cutting so thin a veneer may he gathered from the fact that the leaves are cut out of an inch of white maple wood, and 125 out of wood with every open grain, such as oak and walnut.

AN ALLOTROPE OF LEAD.—It was hut recently annouuced that a Gcrman scientist, Schnetzenherger, had discovered an allotropic coudition of copper. It is now announced that the same scientist has discovered au allotrope of lead. Both disooveries were made by eleetrolysis.

PROF. DANIEL C. GILMAN, formerly President of the University of California, has heen elected President of the American Social Science Association.

Foothills of the Sierra.

[Read before the California Academy of Sciences by B. B. REDDING.]

Geologic Formation.

The western hase of the Sierra Nevada hordering ths Sacramsnto valley, is known in this State as the foothill region. These foothills extend from Reading at the northsrn end of the valley to Caliente at the southern extremity, a a distancs of 350 miles. I am indehted to Mr. A. Bowman, formerly of the State Geological Survey, for the following description of the formatious of this portion of the State. He says: "Gsnerally speaking, there are gradually rising low outliers of upper tertiary gravels, sands and clays all along the western hass of the Sierra. They ars often capped with volcanic matter and cut through hy erosions. The dry winding arroyos through the flattish foothills are familiar to every oue who has followed along ths sdge of the Sacramento and San Joaquin plains. These erosions in soms placss cut down into the middle tertiary and evsn into the cretacsous heds; hut there is little surface area of the latter. Down on the plains all is covered up hy the Recent.

"Patches occur of middle tertiary and upper tertiary where denudation has removed great masses of tertiary country with, these exceptions; for example, at Millerton on hoth sides of the San Joaquin. A patch of middle tertiary hills about three by ten miles is there seen; and at Ione valley, several miles square of steep hills of this period are laid down in slightly pitching heds. The tertiary formations reach away up into the Sierra in the shape of ancient river deposits. They change at from 300 to 1,500 feet altitude into fluviatite deposits; although a large portion of the plains tertiary, to helow the present sea level, is also fluviatite, interhedded with lacustrine or marine, sometimes (apparently) in alternate order.

"The surface areas may be said to change, going eastward, from recent to upper tertiary (pliocene), as the soil helongs ahove or helow the volcanic outflows; and thcu to the slate and granite formations of the Sierra, extending to the Summit.

"The cretaceous formation shows scarcely any surfacc area along the base of the Sierra except in Shasta county; althougb from Folsom north, the ravines and canyons expose its edges; especially north of Oroville, at Reading's ranch, and from there north to Pit river, the flat country is all cretaceous, the tertiary heing mostly removed by denudation. The same is true of patches hetween there and Oroville. The patch hetwecn Fort Reading and Pit river is about 20 miles square. The foothill cretaceous of Butte aud Shasta counties is overlaid by the Shasta coal measures, which are, I think, middle or upper tertiary; and these again hy the upper tertiary formation of the ancient river gravel period and hy the volcanio outflows from the Lassen volcanic chain. No cretaceous rocks have been identified intermediate hetween Folsom and Tejon pass. Lithologically, the cretaceous beds are much more silicified and compacted than the tertiary. They are the shales and conglomerates fouud in these regions; while the tertiary are often loose and fragile, and scarcely worthy of classification in the harder category. Both are very regularly hedded and only moderately tilted here; while on the opposite side of the valleys of the Sacramento and San Joaquin, they are both tilted and altered—remarkahly so in comparison with those on the east side, and in proportion to their age, generally speaking.

"The older rock formations of the Sierra foothills are, in the main, granites south of Fresno river, aud slates north. The slate region contains patches of granite, often several miles square; and there is hetween Folsom and the Central Pacific railroad a large patch, eight or ten miles square at the least, extending from the valley to near Auhurn.

"The granite region at the south has also patches of slate. Opposite Visalia, at the edge of the valley, are two isolated patches 10 by 12 and 10 hy 15 miles.

"It remains only to trace the houndary between the slate north of Fresno river and the tertiary of the valley. Along this line, heginning at the south, are the Buchanan copper mines, Indian Gulch and Snellings near the western Mariposa county line; Lagrange, and Knight's Ferry near the western Tuolumne line; Telegraph City, Campo Seco, Michigan Bar and Mormon Island near the edge of Calaveras, Amador and El Dorado—in short, a line separating these mountain counties from the valley counties, or very nearly. Farther north the framers of the counties did uot study the soil. In Placer county, Rocklin on the west and Auhurn on thc east mark the granite limits; and from there north in Yuha to Oroville in Butte county the first steep foothills of the Sierra are of the slate formation.

"The flat-bedded, unalterecd formations of the foothills described as upper tertiary, rise to very different altitudes in different places. The Oroville Cherokee mesa is, if I rememher aright, considerahly over 1,000 feet above the sea at the Cherokee end. Similar isolated middle and upper tertiary (miocene and pliocene) hills are found left as remnants, all along ths bass of the Sierra south of Oroville, while to the north thsy are plastered up against the Sierra with a cretaceous hase and pressrved hy a volcanic capping covering nearly the whole country.

"The slates and granites extend to the summit of the Sierra, ths line hetwesn the granites of the south and the slates of the north running slantingly from the point mentioned on Fresno river through the heart of Mariposa county towards Lake Taboe in a tolerably direct line."

Climate.

From Reading in the northern end to Sumner at its southern extremity, as has hesn stated, is a distance of 350 miles. The mean annual average tempsraturs of Reading is 64.14°. The lowest point to which the thermometer has fallen since a record has heen kept, was 27°, in Decemher, 1876. Its annual average rainfall is 48.05 inches. Sumner, at thc southern end of the valley, has an annual average tsmperaturs of 68.29° and an average rainfall of four inchcs. The lowest point to which the thermometer has fallen at this place was also 27° on the same day in Dscember, 1876. There is a remarkable uniformity in the climate throughout the Sacramento valley. In it a differsnce of five degrees of latitude, hetween 35° 30′ and 40° 30′, only lowers the annual averags temperature 4.15°. The diffsrsnce of the annual average temperature hetween corresponding dsgrees of latitude in the Atlantic States, at an equal distance from the ocean, is more than eight degrees.

It has been found that the foothills of the Sierra, up to a hight of about 2,500 feet, have approximately the sams tempsrature as places in the valley having the same latitude. It has also heen found that, with increased elevation, there is an increase of rainfall over those places in the valley having the same latitude; as, for illustratiou, Sacramento, with an elevation ahove the sea of 30 feet, has an annual mean temperature of 60.48°, and an average fall of rain of 18.75 iuches; while Colfax, with an elevation of 2,421 feet, has an annual mean temperature of 60.05°, and an average annual rainfall of 42.72 inches. This uniformity of temperature and increase of rainfall appears to he the law throughout the whole extent of the foothills of the Sierra, with this variation, as relates to temperature, namely, as latitude is decrcased the temperature of the valley is continued to a proportionally greater elevation. To illustrate, approximately, if the temperature of Reading, at the northern end of the valley, is continued up the foothills to a hight of 2,000 feet, then the temperature of Sacramento, in the center of the valley, would he continued up to 2,500 feet, and that of Sumner, in the extreme southern end of the valley, up to 3,000 feet.

The increase of rainfall on the foothills in the latitude of Sacramento due to elevation is ahout one inch to each 100 feet. South from Sacramento the proportion dccreases, until, at Sumner, the increase due to elevation is hut half an inch to each 100 feet. This is shown hy the record kept at Ft. Tejon, in the Tehachipi mountains near Sumner, at an elevation of 3,240 feet, where the annual rainfall is 19.53 inches. There is no record kept at any point in the hills above Reading, hut probahly, in this latitude, the increase due to elevation is ahout one and a half inches to eacb 100 feet.

The increase of precipitation on the hills at the northern end of the valley gives greater deusity to the forests, and permits them to grow at lower elevations than in the southern end of the valley. At the same time the difference in temperature is so small that the character of the vegetation of the hills at each end of the valley is not dissimilar. The trees that are found in the vicinity of Reading, at the northern end of the valley helow an elevation of 500 feet, are not found at the southern end until we pass Caliente, at an elevation of 1,300 feet.

It would seem that the temperature of the valley prevails up the Sierra to an elevation that equals the average hight of the Coast Range mountains. If a liue were drawn parallel to the surface of the ocean, from the top of the Coast Range east until it met the flanks of the Sierra, it would mark a level on the Sierra, helow which the temperature would not materially differ from that in the Sacramento valley. This fact is probahly to he ascribed to the prevailing southwest return trade-wind, which hlows over the State from the ocean for more than 300 days in the year; passing the summits of the Coast Range, but small portions descend into the valley, the remxindcr reaches the sides of the Sierra at ahout the level of the summits they have passed.

Arborial Vegetation.

At the northern end of the valley, at an elevation of 500 feet above the sea, of the California oaks arc found *Quercus lobator*, *Sonomensis chrysolopis* and *Wiselzenii;* of pines, only the nut or digger pine, *Pinus sabiniana*; the buckeye, *Æsculus Californica*; and chcmisel *Adenostoma fasiculata*. This is the characteristic arhorial vegetation throughout all these 350 miles. Its presence everywhere shows increased rainfall over the valley, and similarity of temperature to that of the valley. Our pasture oak *(Quercus lobator)* is found at lower elevations in the valley, hut always on moist land or near river courses, proving that it demands, in addition to temperature, the increased moisturc. In the southern end of the valley this vegetation prevails at higher elevations, because it there finds the proper temperature and moisture. Wherever on the foothills any of the trees named constitute the predominant arborial vegctation, it is evidence that the tem-

peratnrs is the same as that of the valley, and that plants that can be successfully grown in the valley can be grown to as high an elevation on the hills as these trees abound. If one tree were to be taken as the evidence of this uniformity of temperature, it would be sabins (the nut or digger) pine. It is never seen in the valley or on the hills below an elevation of about 400 feet. It is not found at a higher elevation than that in which the temperature is the same as that of the valley. It is never found in groves, but singly among other trees; yet it prevails throughout these 350 miles of foothills.

While the vegetation is more dense on the hills at the northern end of the valley, due to increased precipitation, there are also local differences, where there is similarity of soil, due to exposure. Throughout all the lower hills the greatest number of trees is found on gently sloping eastern, northeastern and northern hills, which necessarily are more moist and cool. The southern aspects contain less trees, because exposed to the direct rays of the sun and to the full force of the prevailing winds.

Area of Foothill Region.

On the line of the Central Pacific railroad, the foothills commence at Roseville, which has an elevation of 163 feet. From this point to Colfax—elevation 2,421 feet—in a direct line, is a distance of 32 miles. To allow for all possible errors, it would be safe to estimate that the width of the foothills, where the valley temperature, prevails, is 20 miles. This region, therefore embraces a tract of country from Reading to Sumner 350 miles long and 20 miles wide, or 4,480,000 acres. The principal towns in this part of the State are Oroville, Nevada, Grass Valley, Colfax, Auburn, Newcastle, Georgetown, Placerville, Coloma, Jackson, Sonora, Columbia, Mariposa and Havalah. In the vicinity of these towns and also near the line of the Central Pacific railroad the land is occupied by settlers. It would be using a large figure to state that half a million acres of these foothills have been pre-empted. If we estimate that another million is composed of lands granted to the Central Pacific Railroad Company, ravines, river-beds and lands too rocky or precipitous for cultivation, there would remain nearly 3,000,000 acres of land, all of it timbered, all having abundant rainfall, in a semi-tropical climate and to which title in 160 acre tracts can be acquired by settlement and complying with the rules of the United States Land department. Throughout the whole region everliving springs are numerous, and in those parts where there has been placer mining, there are many canals from which water by purchase can be obtained for irrigation. The immense precipitation that takes place during the rainy season along the western face of the Sierra, passes through this region in streams that are tributaries to the Sacramento and San Joaquin. Within this distance there are 54 of these principal streams, whose waters are perpetually adding to the volume of the Sacramento and San Joaquin.

Adaptation to Cultivation.

Every agricultural product that can be grown in the valley, including the semi-tropical fruits, can be grown with equal facility in these foothills. Ordinarily the land has to be cleared of the trees found upon it, and cultivation must be continuous, for on the whole western face of the Sierra, the native trees when cut, or burned down, are rapidly replaced by a new growth of the same kinds.

These lands are found to have all of the requisites for the successful growth of orchards. Fruit trees thrive better upon them than on the lands of the valley. None of the many theories advanced as to the cause of the treeless condition of many plains and prairies, having ample rainfall, seems to be entirely satisfactory, but experience has demonstrated that orchards grow best and thrive with less artificial aid on lands that in a natural condition are covered with trees.

The increasing exports of small fruits, such as strawberries, blackberries and raspberries, from the vicinity of Newcastle and Auburn, and their superior size and quality, prove that this region is better adapted to their culture than any place yet found on the level lands of the valley. The peaches of Coloma have a stall reputation for flavor and size. The apples of Nevada and Georgetown are equal in size, taste and keeping qualities to the best imported from Oregon. The Oroville oranges have been pronounced equal to the best Los Angeles. The vine grows with luxuriance and bears abundantly wherever it has been planted throughout all this region. The wines of Coloma have more than a local reputation. Persons competent to judge assert that wine from grapes grown on the foothills is free from the earthy taste that characterizes much of the wine of the flat land of the valleys. They also express the belief that if ever wine is to be made in California as light as that from the Rhine, and as free from alcohol, the grapes will be grown in the higher elevations of the foothills, where snow falls and remains on the ground a few weeks each season. It is said that the long summers and great heat of the valleys develop the saccharine matter in the grape, which, by fermentation, is converted into alcohol.

The Lands Open to Settlement.

There is but one Spanish grant in all this region—the Fremont grant in Mariposa. The land, therefore, can only be obtained from the Government, in tracts of 80 and 160 acres. A monopoly of the land in large estates is consequently impossible. The character of the country, being of rolling and rounded hills, prevents the possibility of very large farms. Experiments have shown that the soil is more productive than the dry plains of the valley, but of course it does not yield crops as largely as the deltas and bottom lands of the rivers. It is certainly better and more productive than lands similarly situated in France, Switzerland and Italy, which now sustain a population of millions. Wood is everywhere to be found, and in this region north of Oroville there is an abundance of water in streams and springs not yet appropriated. These lands have remained open for settlement, because, up to the present time, sufficient government land could be found in the valleys. The legislation by Congress has been and still is unfavorable to their appropriation for agriculture. The river bars and benches of this region originally contained the placer gold mines. Positive legislation by Congress forbid their survey for many years after the State was admitted into the Union. When surveys were ordered, the Land Department at Washington was so fearful that they would be occupied by farmers to the injury of the miners, that more than 1,000,000 acres were reserved as mineral land. The placer mines of these foothills have ceased to yield gold, even at Chinese wages, for the past 10 years, yet the Land Department at Washington continues the mineral reservation on these lands. The effect of this is to increase the expense of obtaining title from the Government, and thereby settlement of this region has been retarded. Where a farmer settles on land that has been reserved as mineral by the Commissioner of the General Land Office, the expense has to be borne by the settler, of showing, by testimony, that his farm contains no mines, and that it is only valuable for agriculture. There are 2,000,000 acres of these lands, on which there is no mineral reservation, and which can be obtained by homestead and preemption as cheaply as were the lands in the valley. It cannot be but a few years before the unwise policy of reserving lands as mineral, that, in fact, are not mineral, will be abandoned, so that these lands can be obtained by settlement, pre-emption and homestead as cheaply as other lands.

As I have shown, there are more than 3,000,000 acres of these lands open to settlement, fallow from the flood, waiting for occupants; capable of supporting a population of 100,000 people, if they will but cultivate them; situated in a semi-tropical climate, and, in all the higher regions, free from miasma. One need not be a prophet, nor a son of a prophet, to foretell that, before many years, the agriculture of California will become varied, and cultivation will not be confined to one cereal. Then the foothill region of the Sierra will be occupied by a prosperous and happy rural population.

Useful Information.

The Care of Shop Tools.

The *American Machinist* has some important suggestions concerning the advantage of care and system in the treatment of shop tools. First cost of tools seldom represents their ultimate cost, whether it becomes necessary to repair them or not. If a good mechanic makes a tool last a year in constant usage, while his careless neighbor uses up one of the same kind in six months, the cost of the latter should be accounted twice that of the former. When repairs are made their value must be added in computing the whole cost of the tool.

One primary reason why some shops can show a greater profit on a given amount of work is because they get more service out of their tools. This is just as evident when the tools are cheap as when they are dear, for the products of mechanical labor fluctuate the same as the first cost of tools; and if a large part of the income of the business goes for working tools and repairs to the same, balances on the right side of the ledger are likely to be diminutive, if indeed they appear at all. It is the first requisite that tools and machines should be adapted to the work to be performed. Fine tools should not be used on heavy, coarse work. They must also be kept in good working order, cutting edges well sharpened and bearing surfaces lubricated, shafting kept well aligned, pulleys balanced, belts kept clean and pliable and at the correct tension, rust prevented, emery wheels trued up, and dirt kept out of all wearing parts.

Machines should be mounted on stable foundations and run neither above nor below the proper speed required to do the work. Small tools demand as much care as large ones, and a careless or inexperienced workman will often spoil more than the amount of his wages in files, drills, chucks, reamers, taps, dies, calipers, wrenches and the like, unless closely looked after by the master mechanic. It is therefore very essential, in order to insure proper care of tools, that workmen know just how to use them. All small tools should be laid away systematically in a dry place, when not in use. In large shops a room should be set apart for this purpose, and a man detailed to take charge of it and keep the tools in good working order. There is no part of a large machine shop from which an outsider can form a better judgment of the general management than by an observation of the tool room. The best economy is secured by securing none but the best tools at the outset, for in the long run they will be found the cheapest.

An Insoluble Cement.—A very valuable cement has been discovered by Mr. A. C. Fox, of which details are published in *Dingler's Polytechnisches Journal*. It consists of a chromium preparation and isinglass, and forms a solid cement, which is not only insoluble in hot and cold water, but even in steam, while neither acids nor alkalies have any action upon it. The chromium preparation and the isinglass or gelatin do not come into contact until the moment the cement is desired, and when applied to adhesive envelopes, for which the author holds it to be especially adapted, the one material is put on the envelope covered by the flap (and therefore not touched by the tongue), while the isinglass, dissolved in acetic acid, is applied under the flap. The chromium preparation is made by dissolving crystallized chromic acid in water. You take: Crystallized chromic acid, 2.5 grammes; water, 15 grammes; ammonia, 15 grammes. To this solution about 10 drops of sulphuric acid are added, and finally 30 grammes of sulphate of ammonia and 4 grammes of fine white paper. In the case of envelopes, this is applied to that portion lying under the flap, while a solution prepared by dissolving isinglass in dilute acetic acid (one part acid to seven parts water) is applied to the flap of the envelope. The latter is moistened, and then is pressed down upon the chromic preparation, when the two units, forming, as we have said, a firm and insoluble cement.

To Turn Oak Black.—According to the *Revue Industrielle*, Paris, oak may be dyed black, and made to resemble ebony, by the following means: Immerse the wood for 48 hours in a hot saturated solution of alum, and then brush it over with a logwood decoction, as follows: Boil one part of the best logwood with 10 parts of water, filter through linen, and evaporate at a gentle heat until the volume is reduced one-half. To every quart of this add from 10 to 15 drops of a saturated solution of indigo. After applying this dye to the wood rub the latter with a saturated and filtered solution of verdigris in hot concentrated acetic acid, and repeat the operation until a black of the desired intensity is obtained. Oak stained in this manner is said to be a close as well as a splendid imitation of ebony.

Unslaked Lime for Blasting Purposes.—Unslaked lime compressed into cartridges, or used loosely and well tamped down in the hole, using water or other liquid to saturate and expand it, is now proposed for use in fiery coal mines. It is claimed that the advantages to be derived from its use are economy in the production of coal; making less slack than by using ordinary blasting powder; lives of colliers are in less danger; the breaking and shattering of coal back of the charge—which is especially characteristic of the use of gunpowder—is avoided; and the quality of the atmosphere is rather improved by its use than otherwise.

Bleaching Feathers, etc.—The *Moniteur Industrielle* states that Messrs. Viol & Duplot have recently devised a method of bleaching feathers, which, if successful, will be welcome to many who have been unable to get at the carefully-guarded secret methods used hitherto. Their method rests on the fact that feathers immersed in resinous essences (such as turpentines and other hydro-carbureted oils from distillation of resinous juices in general, or in like oils in lavender, thyme, etc., or in bituminous hydrocarbons) are decolorated under the action of light and heat. The feathers, especially ostrich plumes, are kept in the vessels a longer or shorter time, according to the degree of bleaching wished, and at about 86° F., while exposed to light as much as possible. In three or four weeks they are dried and prepared according to known methods.

Marking Tools by Etching.—Warm the steel and apply a thin coat of white wax, and let it thoroughly cool, then take a sharp engraver (a scratch awl will not answer) and run the point through the hair, in order that the point may be coated with the least possible amount of grease, and mark the device through the wax. Apply nitric acid and allow to stand for a few minutes, then wash off thoroughly with water, and heat the article; rub off the wax with a clean rag. By a little practice any one, who can form a shapely letter, will be able to mark a tool very nicely.

Green Ink.—Dissolve 180 grains bichromate of potassa in one fluid ounce of water, add while warm half an ounce spirit of wine, then decompose the mixture with concentrated sulphuric acid until it assumes a brown color; evaporate this liquor until its quantity is reduced to one-half, dilute it with two ounces distilled water; filter it and add half an ounce of alcohol, followed by a few drops of strong sulphuric acid; it is now allowed to rest, and after a time assumes a beautiful green color. Add a small quantity of gum arabic and it is ready for use.

To Make India Ink.—A German paper gives the following recipe for making a deep black india ink, which will also give neutral tints in its half shades: Rub thoroughly together eight parts of lamphlack, 64 parts of water, and four parts of finely pulverized indigo. Boil the mixture until most of the water has evaporated, then add five parts gum arabic, two parts of glue, and one part of extract of chiccory. Boil the mixture again till it has thickened to paste, then shape it in wooden molds which have been rubbed with olive or almond oil.

Good Health.

Why are we Right-Handed?

Investigations which were very recently carried through by a French physician, Dr. Fleury, of Bordeaux, have adduced facts showing that our natural impulse to use the members on the right side of the body is clearly traceable to physiological causes. Dr. Fleury, after examining an immense number of human brains, asserts that the left anterior lobe is a little larger than the right one. Again, he shows that, by examining a large number of people, there is an unequal supply of blood to the two sides of the body. The brachiocephalic trunk, which only exists on the right of the arch of the aorta, produces, by a difference in termination, an inequality in the waves of red blood which travel from right to left. Moreover, the diameters of the subclavian arteries on each side are different, that on the right being noticeably larger. The left lobe of the brain, therefore, being more richly hæmatosed than the right, becomes stronger; and as, by the intersection of the nervous fiber, it commands the right side of the body, it is obvious that that side will be more readily controlled. This furnishes one reason for the natural preferences for the right hand, and another is found in the increased supply of blood from the subclavian artery. The augmentation of blood we have already seen suggested; but the reason for it is here ascribed to the relative size of the artery, and not to any directness of path from the heart. Dr. Fleury has carried his investigations through the whole series of mamalia; and he finds that the right-handed peculiarities exist in all that have arteries arranged similar to those of man. At the same time such animals, notably the chimpanzee, the seal, and the beavers, are the most adroit and intelligent.—*The Electic.*

The Use of Tea.

The following hints concerning the use of tea may prove useful.

1. Whoever uses tea should do it in great moderation.
2. It should form a part of the meal, but never be taken before eating, or between meals, or on an empty stomach, as is too frequently done.
3. The best time to take tea is after a hearty meal.
4. Those who suffer with weak nerves should never take it at all.
5. Those who are troubled with inability to sleep nights should not use tea, or if they do, take it only in the morning.
6. Brain-workers should never goad on their brains to overwork on the stimulus of tea.
7. Children and the young should not use tea.
8. The over-worked and under-fed should not use tea.
9. Tea should never be drank very strong.
10. It is better with considerable milk and sugar.
11. Its use should at once be abandoned when harm comes from it.
12. Multitudes of diseases come from the excessive use of tea, and for this reason those who cannot use it without going to excess should not use it at all.

Food too Easily Digested.—The healthy adult requires food which will give the stomach work to do. The stomach requires work as much as the legs or arms. The nutriment of food for such should not be abstracted and ready prepared, as, for instance, it is in milk, eggs, meat; it is better that the stomach abstract it by the process of digestion from food. With the sick and the young, however, the case is very different. The stomach of a strong man is like a quartz crushing machine, capable of doing vigorous work. That of a dyspeptic is quite different, and may need great care to enable it to do its work at all. Weak stomachs, however, may be trained by slow degrees to do their work well by giving them just the right food, properly chewed, and stopping the expenditure of nerve force in other directions so that the blood may go to it. By such a course half the dyspepsia might be avoided or cured.—*Herald of Health.*

The Nails.—The growth of the nails is more rapid in children than in adults, and slowest in the aged; goes on faster in summer than in winter, so that the same nail which is renewed in 132 days in winter, requires only 116 in summer. The increase of the nails of the right hand is more rapid than those of the left; moreover, it differs for the different fingers, and in order corresponds with the length of the finger, consequently it is the fastest in the middle finger, nearly equal in the two on either side of this, slower in the little finger and slowest in the thumb. The growth of all the nails on the left hand requires 82 days more than those of the right.

Pie for Dyspeptics.—Four tablespoonfuls of oatmeal, one pint of water; let stand a few hours, or till the meal is well swelled. Then add two large apples, pared and sliced, a little salt, one cup of sugar, one tablespoonful of flour. Mix all well together and bake in a buttered pie-dish; and you have a most delicious pie, which may be eaten with safety by the sick or well.

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The Week.

The excitement of the week in mining circles has been the annual meetings of the California, Consolidated Virginia, and Sierra Nevada mines, elsewhere referred to. Another item of interest to the mining community is the re-election of Senator Jones, of Nevada, to Congress. Still another, is the fact that the first water from the Comstock has been run through the Sutro tunnel. The great pumps of the Chollar-Savage-Norcross shaft were started up and sent the water through the drift on the 1593 level into the Sutro tunnel. This is the first water ever pumped into the tunnel, and hence the significance attached to it. Hitherto, since the connection between this shaft and the tunnel was made, what water accumulated in the shaft above the 1593 level has been caught up and sent into the tunnel, but never has a drop been pumped into it before. The Gold Hill *News* says: "Not only is this fact important in itself, but it is also significant when considered in connection with the situation. The fact that preparations have been for some time going on to drain the flooded mines through the lightning drift on the 2000 level of the Savage and Hale & Norcross to this shaft, is well known. The whole plan of operations becomes at once apparent, when the fact is made known that no pumps have been placed in this shaft above the 1800 level. The purpose is plain. Mr. Sutro must take not only the water encountered in the shaft, but also that from the flooded mines, as soon as the preparations for passing it through the lightning drift are completed."

Delegate Gannon thinks the Mormons would be cravens and poltroons if they yielded their religious principles to the dictates of the Supreme Court.

Mining in 1878.

Condition, Progress and Production in the Pacific States and Territories.

As usual at the commencement of each year, we present a cursory review of the mining industries of the Pacific coast for the preceding twelve months. It has been the custom to accept the aggregate amount of hullion made each year as fairly indicating the condition and progress of our mining industries for that year. Measnred hy this standard, the year just closed could hardly he considered a prosperous one; that is, as compared with some of its immediate predecessors, its yield having heen less than that of 1877 hy more than $17,000,000, and less than that of 1876 hy nearly $10,000,000. But the increased production of these two years was due, as is well understood, to the large output of ore from the Con. Virginia and the Califoruia mines on the Comstock lode, and heyond these two properties, could he said to have no special hearing on the mining interests of the coast. As this increase was due to the two mines mentioned, so also has the recent falling off in the aggregate hullion yield been due to a curtailment of their production, and not to that of the mines generally, which, taking the country throughout, have more than kept up the ratio of advance that has now been maintained through a long series of years. There has heen, of course, as there is every year, a decline in some localities and an increase in others. The countries to he credited with an increase for the year, as compared with 1877, are as follows, viz.: California, which shows an increase of $2,068,000 in gold, with a decrease of $1,323,000 in silver, heing a net increase of $745,000; Montana's increase equals $1,118,728, all in silver; Dakota's $715,804, all in gold; Idaho shows an increase of $35,627, three-fourths gold; Oregon, $21,727, nearly all gold; Washington, $18,915, all gold; New Mexico, $74,803, two-thirds silver; British Columhia, $106,270, all gold. Colorado shows a slight increase, ahout equal parts gold and silver, the hullion receipts for the year at San Francisco from the west coast of Mexico, nearly all silver, showing an increase of $162,003. The decrease has heen, in Utah $1,049,142, and in Arizona $100,639. The hullion of Arizona consists of ahout 85% silver, and the halance gold; that of Utah heing composed 90% of silver and lead, the decline in the value of the hullion here produced heing largely due to the depreciation of these metals in the markets of the world.

Annual Production and Rates of Increase.

In the foregoing estimates we have, as in former years, adopted the statements prepared annually hy John J. Valentine, General Superintendent of Wells, Fargo & Co.'s express, and which give the total product of hullion for the entire coast, receipts from British Columhia and Mexico included, dnring the years mentioned helow, as follows:

Years.	Amounts.
1870	$54,000,000
1871	58,284,000
1872	62,236,959
1873	72,258,693
1874	74,401,045
1875	30,889,057
1876	90,875,173
1877	98,421,754
1878	81,154,622

By consulting the ahove tahle it will he seen that a steady progress was made in the hullion production of the coast during the seven years preceding 1878, the advance, when sharply accelerated, having heen caused hy an unusually heavy output from some portion of the Comstock lode. The aggregate gain made during these seven years amounted to $44,500,000, heing at the rate of $6,357,000 per year. It is needless to say that much fault is every year found with these estimates of Mr. Valentine, the local press and parties interested in each particular locality heing apt to complain that his figures fail to fully represent the hullion there produced. While there may in some cases he cause for snch complaint, the tahles prepared hy that gentleman constitute, as a whole, the most reliable data we have in the premises, and must he generally accepted until such time as something more full and anthentic can he ohtained. As regards the State of Nevada there was reason to anticipate some falling off in its gross production, the management of the two honanza mines mentioned, having advised the puhlic at the heginning of the year that such result was prohable if not inevitable. In the case of Utah, too, some decline was looked for, owing to the heavy discount on silver and the prevailing low prices of lead. Of Arizona, however, a hetter account was expected. It was universally thought that she would he ahle to maintain, if not make some advances on, her former largest annual production; and it may well he that more hullion has escaped from that Territory through Eastern channels of transit than Mr. Valentine has given her credit for. While Montana has rather exceeded, Colorado has hardly come up to general expectation; Dakota having failed hy a good deal, to fulfill the promises made hy her friends a year ago. Of particular localities, none bas been able to make a hetter showing than the Eureka district in the State of Nevada, which has turned out for the year $6,981,406, as against $5,676,057 in 1877, heing an increase of $1,305,349. The Bodie district, Mono county, Cal., has also done notahly well, as have also some of the hydranlic mines in this State; more especially several of those operating on the San Juan ridge, Nevada county.

Relative Production of Gold and Silver.

The fact that the two royal metals are now heing produced on this coast in nearly equal quantity should tend to allay the fears of those, who since the discovery of so many silver-hearing mines on American territory, have entertained a fear this metal would attain to an undue preponderance as an element of the currency. From the time that gold was discovered in California, followed soon after hy like discoveries in Australia, the increase of that metal was for many years relatively much greater than that of silver, the disproportion having heen maintained on this coast till the year 1877, when the silver yield was slightly in excess of that of gold; a condition of things that has ohtained for that year only.

Last year our domestic prodnction of silver—receipts from Mexico heing omitted—was $37,248,137; gold, $37,556,030—excess of gold, $407,893. The Comstock hullion made during the year, consisted of 45% gold and 55% silver, the so-called base hullion of Nevada having contained 30% gold. The balance of it was nearly all silver, not more than two or three per cent. of the value consisting of lead. The gross hullion yield of the coast for 1878 contained the several metals approximately as follows: Gold, 48%; silver, 48%; lead, 4%; a proportion that is not likely to he violently disturhed in the near future, and which argues strongly in favor of a retention of our present bi-metallic currency. Certainly the present aspect of affairs affords little warrant for imposing further restrictions upon the coinage of silver, to say nothing of its demonetization, as contended for in certain quarters. So far as Australia and other recently discovered sources of hullion productiou are concerned, they will no douht continue to turn out more gold than silver.

Sources of Production and the Sum Total.

It is now just 31 years since the grand discovery of gold was made in California. During this period there has heen produced in the States and Territories west of the Missouri river, hullion to the value of $1,985,527,939. Of this amount ahout $1,581,433,693 has consisted of gold, and $404,094,246 of silver. Besides this, there has heen produced to date in the several Atlantic States something like $30,000,000, the most of it in Nortb Carolina, Virginia and Georgia.

If to the tahle of hullion production given on the next page, he added the entire yield of British Columhia to date, $33,000,000, San Francisco receipts from the northwest coast of Mexico, $9,000,000, and the product of the Atlantic States, $30,000,000, we have a total of $2,057,527,939 produced from the ahove sources, all hut $42,000,000 heing from mines within the limits of the United States.

Mining in California—Hydraulic Operations.

The business of mining for the precions metals in California during the year under review was, as already remarked, fairly prosperous. Owing to a rather restricted water supply the returns from the hydraulic mines, now the principal source of gold production in this State, fell a little short of what might otherwise have heen expected. There was, however, not much ground for complaint, and with an average amount of rain the coming year will see a large crop of gold gathered hy this class of miners, who employed the leisure afforded hy the last dry season to a good purpose, their claims having, as a general thing, heen put in excellent shape for future operations. Placer, Nevada, Sierra, Bntte and Yuha counties, as heretofore, continue to he the most active and productive centers of hydraulic mining, although some very snccessful enterprises of this kind are heing carried on in Amador, El Dorado aud Plumas. In Trinity and Siskiyou, where this industry was introduced at a later period, it is also meeting with a gratifying success; the conditions for prosecuting it profitably heing in some respects hetter there than in any other part of the State. Water in these more northerly counties is more easily ohtained, and for the extent of the mines, is in hetter supply than in the older hydraulic districts. In the matter of outlet, ahsence of indurated gravel and barren material, unwieldly houlders, etc., they are also hetter situated; and there is no douht hut these counties, more especially Trinity, offer just now the hest openings for investment in this department of mining, to he found on the coast. It should he remembered, however, that these opportunities, even there, are not numerous; the hydraulic deposits of Trinity heing confined to the auriferous helt, that strikes centrally across the county, snd to which all the mines there, including the hars along Trinity river, are indehted for their enrichment. Several of these hars afford the hest possihle chances for inaugurating permanent and paying hydraulic operations. Buckeye mountain, Brown's ridge and Oregon mountaiu, with one or two other similar elevations, also offer exceptionally good inducements for the investment of money in this branch of mining. Appurtenant to some of these properties are fine water privileges that belong to the Buckeye Mountain Ditch & Mining Company, heing one of the most valuahle in the State. That these natural advantages have not heen turned to a more practical account, has heen owing to the fact that the most of these properties have heen in the possession of the pioneer miners and early residents of the county; a class, not overly ambitious or covetous of money, and who, so long as they could realize moderate wages working their claims with such water as the rains afforded, and in a small way, were averse to the exertion and hother necessary to outfit and insure from them a larger production. For many years, too, Trinity heing remote and difficult of access, was not much visited hy capitalists or their agents, or others desirous of finding good openings for the profitahle investment of money. Since the extension of the railroad to its horders, affairs in this county have hegun to change. Experienced hydraulic miners from older localities have gone there, and appreciating the situation, have managed to acquire interests that under their skillful management have already become valuable; and as the attention of our moneyed men is now heing turned strongly toward Trinity and Siskiyou, it may he expected that hydraulic mining will soon undergo a marked expansion in this northeru section of the State.

Drift Mining.

The drift diggings of California have turned out well of late, considering how small a number of claims have yet been opened up and placed in good working condition. The huried channels of the ancient rivers afford here a wide and profitahle field for the prosecution of this style of mining; the only drawhack to this class of ventures heing that they require a considerahle outlay of labor and money hefore making any return. It consumes also, in most cases, a good deal of time to sink the shafts or run the tunnels necessary to reach and work these deposits. Still, with the appliances for hastening this kind of work, now within easy reach, this objection hecomes less formidahle, while a hetter knowledge of the exact levels on which the exploratory tunnels should be run, enahles the engineer to avoid the mistakes which formerly proved fatal to so many of these enterprises. The drift claims at Forest City, Damascus and Michigan Bluff, continue to yield, as they have done for many years, large amounts of gold dust. Many other claims, more recently opened elsewhere, are also heginning to make good returns; while others, having nearly completed their shafts or tunnels, will most likely he producing in a very short time.

Vein Mining.

This, hy far the most important branch of our mining industries, has, as already observed, heen attended during the past year with a full average measure of success. In California our gold-hearing quartz mines have produced fairly, and with their accustomed evenness. If in this department of the business we have hut few startling ore-finds to note, so also are there hut few disastrous failures to record. Throughout the entire southern section of the State, with the exception of Mono county, vein mining has made less progress than was at the commencement of the year hoped for. In Tuolumne county it has experienced some revival, and the outlook there may he said to have heen much improved. In the more central and northern group of counties this industry has also made fair headway, the Idaho, Sierra Buttes, Plumas Eureka and the Black Bear mines having kept up their usual large production, while a numher of otber properties have developed promising ore bodies during the year. In a district named the Silverado, situated in Los Angeles county, a considerahle numher of argentiferous lodes were discovered during the past summer, and some progress made in the work of their development. How rich or permanent the deposits will prove remains to he determined. There seems to be a good prospect, however, of some payiug mines being found there.

Mono County.

For the past year or more this county has heen a central point of attraction hy reason of the many rich gold-hearing lodes that have heen discovered and partially opened up in the Bodie district; a locality that for the preceding 12 or 14 years had heen almost wholly neglected. The mines here are worthy of attention, not only on account of their large actual production, hut also their great prospective merit, there heing at least a score that promise to develop into as good properties as the Standard or Bodie, thus far the most productive mines in the district. As the resuscitation of these mines was primarily due to the efforts made hy the present owners of the Standard to outfit that property and place it on a paying basis, it may he worth while to relate hriefly some of the circumstances connected with the history of that mine. The Standard was owned in the first instance by two German miners, who, up to the month of Septemher, 1876, had worked the ore with good results, hut in a small way, arastras only heing employed for its redaction. At that time the Cook Bros. hought it for the sum of $67,500, and worked it with such effect that they were ahle hy the next Septemher to pay a first dividend from its net earnings of $1 per share, aggregating $50,000. A like dividend has heen repeated every month since, and will prohahly he kept up for many years to come, it heing estimated that there is now sufficient ore developed ahove the 450 level to yield $3,000,000, with a prospect of its extending indefinitely downward. Not less than six valuahle ledges, varying from 15 inches to 15 feet in thickness, some of them of extraordinary richness, have heen opened up, or rather discovered, already, within the limits of the company's claims, which are 1,500 feet in length hy 1,200 in width, and not yet more than half prospected. More than one-half of the 50,000

shares of this company belong to Messrs. Seth and Daniel Cook of this city, who were associated with John F. Boyd and George Story in the purchase of the property. The balance of the shares is held in few and strong hands, this stock being rarely offered on the market. The entire width of the Staadard ground, and for some distance on each side, including the Bulwer and Belvidere mines on the west, and the Summit on the east, appears to be composed of one vast aad continuous ore channel, filled with a system of veins branching from or interlacing with each other; some of which carry very high grade ore, while others are of less value, but rarely do the assays fall below $15 or $20 per ton. The ore in all these veins is of a homogeneous character, beiug generally soft, stratified, free from sulphurets, aud carrying fine free gold well diffused throughout the vein; though containing seams very frequently of extraordinary richness—averaging several thousaud dollars per ton. The ore also contains a large proportion of clay, which seriously interfered with milling, until this compauy introduced the eilvor or pan process, which enables them to savo fully 90% of its value. The compaay has a 20-stamp mill, which will be enlarged the coming spring, after which the dividends will ao doubt be increased in a corresponding ratio.

The monthly product at present is about $100,000, the average value of the ore worked being about $70 per ton. The company has an incline shaft followiug the ledge at au anglo of about 40 degrees to the depth of 835 feet, through which the mine has thus far beeu worked. A now perpendicular three-compartment shaft is going down rapidly, haviug already reached a depth of about 800 feet, and will ultimately be carried to auy depth required for the future working of the mine. A suspended wire tramway conveys the ore at a nominal cost from the hoisting works to the mill. From present appearances, the Standard mine will continue to pay dividends for a lifetime. Happily all adverse claims have beea settled, and the titlo is perfection itself, embracing everythiug from a Uuited States patent; down to the recent school-section-State-title dodge. The total product of the Standard siace it passed under its present management amounts to over a million dollars, of which $850,000 have been disbursed to shareholders in 17 consecutivo monthly divideads, constituting as good a record as attaches to any miue on the coast.

The Bodie mine to date has also turned out considerably over a million dollars, a large proportion of which has consisted of net earnings and been paid to the shareholders in moathly dividends, none of which have yet been intermitted. Besides the Bodie, two or three other promisiag mining districts have lately beea discovered in Moao county, of which the Indian and Lake would seem to be the most important.

In the State of Nevada

There is little calliag for special comment except the shriakage of ballion production on the Comstock rauge, through the causes already alluded to. It may further be etated in this connection, that the year has failed to bring with it the ore developments elsewhere along that range hoped for at its commencement; and taken altogether, the mining outlook along the Comstock cannot be said to be just now particularly encouraging. With a valuable ore find, however, in the Sierra Nevada, Ophir, or at ether point of deep exploration, affairs there would no doubt speedily mend, aud confidence be so far restored, perhape, as to render a coutinuation of active explorations still possible. The resulte of the current year will go far toward determining this latter question. The Sutro tuunel, after a period of nearly ten years spent in its construction, reached the Comstock lode, its objective point, toward the end of the year; the event haviag ae yet been productive of no very marked results, though doubtless it will he of much service in aiding to draia the mines, as well as tend to promote their ventilatioa.

Among the New Mining Localities Discovered in this State During the past Year

The Pyramid and the Paradise districts are the most prominent. Both have attracted much notoriety, and for hoth a good deal of merit has beea claimed. To what extent they deeerve either, remains, however, to be seen. The former of these districts lies in the northern part of Washoe and the other ia Humboldt county; the first has but poor and the latter only moderately good facilities for ore reduction. About eome of the newly-opened minee in this State a good deal has also been said. In this category is the Alexander, located at the westerly hase of the Shoshone mountains, in Nye county. This may be a good property, though the neighborhood has, in times past, been less noted for its euccesses than its failures. In the Columbus district, the Mount Potosi group of mines has been opened under promising conditions, the ore developments beiag already large aad the management an exceptionally good one, heing the same that engineered the Northern Belle, lying near by, to its great success.

Work has been Resumed

During the year on several of the old mines iu the State, upon some of which it had for a long time been suspended or been prosecuted without system or energy. In this list we have the Highbridge, at Belmont, which an Eastern company, after an expenditure of nearly a million dollars, disposed of to a party of practical minere for less than a tithe of that sum. Since resuming operatioas there the presont owners have recovered the faulted lode aad are in a fair way to realize a fortuae from their purchase At the town of Aurora, in the Esmeralda district, a shaft is being sunk to explore a series of the more promising lodes iu that locality, which, after some superficial prospecting, was abandoned many years ago. As the parties who have engaged iu this enterprise have ample means aud desiga making a thorough job of it, it may be expected that something determinate of the merits of this once noted district will be reached before loug. With this revival of work at some points, is to be coupled its suspeasion at some others. Iu the uafortunate White Pine district, the English company, abont the oaly live iastitution there, have, after keepiug up the etruggle for a long time, ceased operations, but whether permaneutly or temporarily we are not advised. In the Mineral Hill and in tho Grant districts, where also English capital was interested, operatioas drag slowly or have come to a dead stop. As cause for hoth surprise and regret it is to be observed that some Nevada companies, which for a series of years had conducted their affairs to the satisfaction of the shareholders, bave lately fallen into disfavor, the Manhattan heing an example of those that have most recently passed uader the cloud. There has also been much murmuring at the manner in which some of the mines in the Tuscarora and the Ely districts have been mauaged of late, and it is to be hoped that with the incoming year such reforms will be instituted both in this State aud elsewhere, as will leave less cause for these complaiats in the future.

Of Arizona

It may be said, that while she has not quite made good the predictions of her more sanguine friends, she has still done much during the past year to sustain her good fame as a mining country. Besides making a very creditable production of bullion, she has added considerably to her population, increased her live stock of all kinds, as well as her farming products. A large extent of new mining territory has been explored and some important mineral discoveries made; and what is of more consequence still, the Southern Pacific railroad which had before reached her western border, has again heen started ahead, aad is rapidly advancing centrally across the Territory. With this road once extended to her more important mining districts, as it soon will be, all her vital interests will he greatly quickened and Arizona begin to realize something of that prosperity, which though often predicted for her, has been long postponed.

Of our Other Pacific States and Territories

It will suffice to say the mining outlook is everywhere full of eacouragement. Utah, dispite the drawbacks already mentioned, is believed to be entering upon a year of renewed prosperity. Colorado, also, seems on the eve of a new aad better era in her mining iadustries; great gains having been made in the methods of treatiug her refractory ores, and some very important mineral diecoveriee having recently been made within her borders. Montana, having lately taken a forward etep, will not be likely to come at once to a dead halt in her progress. The extension of the Northern Utah narrow-guage railroad ie beginning to tell with good effect on the mining interests of both Montana and Idaho. Gold mining in Oregon ie in a very healthful condition, the productioa this year promising to be much larger than ever before. According to the accounts from New Mexico, that Territory is almost sure to do better this year than she did last; while Dakota, if the newspapers there speak truely, is going to speedily exalt herself ae a gold-producing country.

Table Showing the Annual and Total Yield of Bullion in the States and Territories West of the Missouri River.

Year.	California.	Nevada	Montana	Idaho.	Colorado	Oregon & Wash. T.	Utah.	Arizona	Dakota	New Mexico	Wyoming.
1848.....	$ 5,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1849.....	23,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1850.....	50,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1851.....	60,000,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1852.....	50,000,000	.....	.....	.....	.....	$ 500 000	.....	.....	.....	.....	.....
1853.....	68,000,000	.....	.....	.....	.....	500,000	.....	.....	.....	.....	.....
1851.....	64,000,000	.....	.....	.....	.....	500,000	.....	.....	.....	.....	.....
1855.....	58,000,000	.....	.....	.....	.....	600,000	.....	.....	.....	.....	.....
1856.....	63,000,000	.....	.....	.....	.....	700,000	.....	.....	.....	.....	.....
1857.....	61,000,000	.....	.....	.....	.....	600,000	.....	.....	.....	.....	.....
1858.....	59,000,000	.....	.....	.....	.....	500,000	.....	.....	.....	.....	.....
1859.....	50,000,000	$ 100,000	.....	.....	.....	700,000	.....	.....	.....	.....	.....
1860.....	52,500,000	500,000	.....	.....	.....	1,500,000	.....	.....	.....	.....	.....
1861.....	50,000,000	2,300,000	.....	.....	.....	2,000,000	.....	$ 100,000	.....	.....	.....
1862.....	51,500,000	6,500,000	$ 500,000	.....	.....	2,200,000	.....	200,000	.....	.....	.....
1863.....	50,000,000	12,500,000	8,000,000	$ 500,000	.....	2,300,000	.....	150,000	.....	.....	.....
1864.....	35,000,000	16,800,000	13,000,000	6,400,000	.....	2,500,000	.....	150,000	.....	.....	.....
1865.....	35,000,000	16,800,000	14,000,000	6,500,000	$ 100,000	2,000,000	.....	200,000	.....	.....	.....
1866.....	20,000,000	16,000,000	18,000,000	8,000,000	1,000,000	3,000,000	.....	200,000	.....	.....	.....
1867.....	25,000,000	20,000,000	12,000,000	6,500,000	2,000,000	3,000,000	.....	300,000	.....	.....	.....
1868.....	22,000,000	15,000,000	15,000,000	7,000,000	3,100,000	4,000,000	.....	500,000	.....	$ 100,000	.....
1869.....	22,500,000	14,500,000	10,000,000	7,000,000	4,000,000	3,000,000	$ 200,000	1,000,000	.....	500,000	$ 150,000
1870.....	25,000,000	16,000,000	9,000,000	6,000,000	3,200,000	3,000,000	1,300,000	800,000	.....	500,000	150,000
1871.....	20,000,000	22,500,000	8,000,000	5,000,000	4,300,000	2,500,000	3,000,000	800,000	.....	500,000	150,000
1872.....	19,000,000	25,000,000	6,000,000	2,700,000	4,500,000	2,200,000	2,500,000	600,000	.....	500,000	150,000
1873.....	18,000,000	35,300,000	5,000,000	2,500,900	4,100,000	1,500,000	3,800,000	500,000	.....	500,000	100,000
1874.....	20,300,000	35,500,000	3,500,000	2,000,000	5,000,000	800,000	4,000,000	50,000	.....	500,000	100,000
1875.....	17,700,000	40,000,000	4,000,000	1,400,000	6,400,000	1,300,000	7,000,000	500,000	.....	600,000	100,000
1876.....	18,000,000	40,300,000	2,800,000	1,700,000	7,000,000	1,300,000	5,600,000	1,400,000	$ 600,000	500,000	100,000
1877.....	18,174,716	51,589,290	2,841,912	1,832,495	8,913,549	1,284,223	7,113,755	2,388,622	1,500,000	379,010	100,000
1878.....	18,920,451	35,181,949	3,763,640	1,868,122	6,232,747	1,287,035	6,064,613	2,287,983	2,215,804	453,813	100,000
Total..	1,184,095,177	431,762,239	135,208,552	65,900,717	59,846,296	45,271,258	40,218,368	12,576,705	4,315,804	5,032,823	1,200,000

WAVE POWER.—Mr. Filmer, the foreman at Painter's Type Foundry, has constructed a costly model of a machine invented by him to utilize wave power, which can be seen at Mr. Howland's office, No. 401 California St. He employs a float about 24x4 feet, which rises and falls with each wave, working a lever, and in that manner pumping water to any desirable altitude.

Coal and Mineral Lands as Agricultural Lands.

While the Interior Department and the War Department are disputiag about Indiaa bureaus and surveys, a special agent has been sent to Colorado, from the General Land Office, who has just reported (says the Washington *Land Owner*), that a large number of fraudulent entries have been made of coal laads, as agricultural lands. The Secretary of the Interior, on the 5th inst., submitted his reports on the subject to the Attorney General; and the questioa now is, whether the patents shall be cancelled through the courts?

The law aad the precedents in such cases, are simply intended to prevent great tracts of coal or mineral laads from getting locked up in the haads of speculators, who will do nothing with them. But millions of acres of coal underlying whole counties of agricultural lands, have been settled upon, all over the United States, and have never heeu known as anything else than farming lands. If the Attorney General uuderstands the matter therefore, in cases of this kind, where there has been no intentioual fraud or subverstion of the law, he will refer the whole question back to the Interior Department with a note.

It might run to this effect: That the only way for the Department to avoid being "defrauded of large sums of money" by pre-emptions of coal or miaeral lands, will he to institute a segregation of the lande by geological survey. It would not be difficult for the Department to obtain, from the maps of such a survey, areas in which the surface is most valuable, eeparated from others where the coal or material under the eurface, is the most valuable. How else cau the matter be determined equitably?

The Land Office plats ought to show what the Government is selling. It is not fraud to huy agricultural laads as such, from the Government, merely because the eeller afterwards discovers some accessory value attaching to it, or because he suspects that the buyer knew it before him. The Land Office is holding out a premium for perjury, without preventing coal land monopoly in the slightest degree.

In the organization of the geographical and geological eurveys hereafter, the waats of the Land Office, if not placed foremost, should certainly not he overlooked. It is nearest to the material wants of the people; and its surveys and maps are most directly concerned with the development of the soil and of the mine. The Pacific States and Territories are more interested even in the coal land question than is commonly supposed.

BATHING HOUSE AND SWIMMING SCHOOL.—There is a laudable movement on foot to establish a first-class bathing house and ewimming school at North Beach, S. F. The plans include a handsome building with swimming circle, dressing rooms, private baths, etc., below; and furnished apartments above. A prospectus has been issued hy E. M. Morgan and J. L. Sanford as managing agents, in which those seeking enterprises for the investment of money, are iuvited to suhecribe to the stock of this institution. The agents are at No. 80 Nevada block, where full drawinge and proposed details of plaas, prospecte, etc., can be had by those interested.

AUTOMATIC GRIP FOR WIRE TRAMWAYS.—Mr. John Samsoa, C. E., of this city, has iaveated a grip for wire rope tramways for mineral traffic. The novelty consiete in that the cars are rapidly attached to the rope and may be detached at any point on the road required, by simply putting a stop to touch a trigger on the connecting bar. Thus the necessity of conductors on the cars ie avoided, and cars loaded with mineral or grain can he dispatched in frequent succession without trouble or attendance.

AN American bank is about to be established at the city of Mexico.

A Paper of General Interest.

We invite attention to our "Aanual Mining Review" published in this issue of the PRESS. While it is impossible to speak of particular localities or properties witb much detail, where such a great extent of conutry has to be gone over, there will be found in this nrticle much to interest the mining public, as well as matter calculated to commaad the attentioa of the respective advocates of a mono-metallic, a bimetallic and a uoa-metallic currency. Through the several tables presented in this report much light is tbrown upon the questioa of hullion productien, the annual and the total yield of gold and silver, as well as the comparative iacrease of these two metals; both upon this coast and throughout the entire country beiug thereiu set forth. These tables have been compiled from the most trustworthy sources, and may be accepted as containing the most authoritative figures on this subject extaat. By consulting them it will be seen that the opinion so generally entertained that the productioa of silver has of late been largely in excess of that of gold is not well founded. Only ia a single year has this occurred, the aggregate value of the gold produced in the United States having been nearly four times as great as that of silver; and it is probable that nearly the same ratio of iacrease has during the past 25 or 30 years held good the world over. When the Comstock lode was first discovered the most exaggerated reports as to its great wealth, spread rapidly over the world, the impression everywhere obtaining that it was purely a silver-bearing lode. This having beea followed soon after by equally exaggerated reports of like discoveries elsewhere oa this coast, the above erroneous impression was intensified to a degree that filled the nations with apprehensions of an immediate silver glut; hence the crusade against this metal and its partial demonetization hy some of the leading nations of Europe. It subsequeatly transpired that the Comstock ores carried nearly as much gold as silver, and that the rumored discoveries of this latter metal in other parts of the country had but little to justify them. But it took years to bring these facts home to the knowledge of people abroad, aad eradicate from the popular mind these false impressions. With these mistaken notione corrected, it may be expected that more just and enlightened opinions upon the subject of the currency will prevail, and that both of the royal metals will continue to he employed for effecting exchanges and measuring values.

The "Golden Mountain" and the Oranges.

Mr. Redding's paper on the "Foothills of the Sierra," on our inside pages, gives origiaal facts of importance in regard to that iuteresting region. First, the geological formations are described, furnishing the foundatioa on which the horticulturist has to build. The curious fact that the climate of the foothills is more even day and night, and less marred by frosts injurious to semi-tropical fruits, thaa the valleys of the Sacramento and San Joaquin, is precisely and authentically stated; and the cause thereof is clearly explained.

Nothing is wanting to make the foothille one of the most beautiful, and the richest of horticultural regions in the world, but making use of the provisions for irrigation which the Sierra Nevada eo abundaatly afford, and directing them so that the individual land holder may derive a fair benefit from them. Examples of what can be done in this respect are not wanting; but the work is scarcely begun.

Corporations will not monopolize the water rights and the rainfall, wheu the day arrivee for the foothills to he prosperous. The people who uadertake to make homes there, will have an interest in the bounty that comes from heaven. As it has to be impounded, however, in reservoirs, and led long distances ia ditches, the corporatious that have done the work so far, are the first to reap the benefite.

If the laud holder can be protected from unreasonable exactions, while he is furnished with oaly a little water to irrigate, hie home ia the foothills of the Sierra will be bleet with such rare advaatagee that the combination seems certainly unequaled, in most other parts of the world.

THE Presidio Railroad Company, of which Messrs. A. R. Baldwin, A. S. Hallidie, A. W. Bowman, Albert Miller and others are directors, has issued a circular with a fine map, showiug the ronte of their proposed double track wire cable railroad along New Montgomery and Union etreets. It is expected that North Beach and Fort Point real estate will be greatly enhanced, and that the road will pay well; propositions that can hardly be doubted. That portion of Saa Francisco hae the best outlook.

A DOUBLE size iseue of the MINING AND SCIENTIFIC PRESS, containing eight extra pages, with an article and map of Sonora, Mexico, will appear on the 25th inet. Other original articlee, of scientific as well as industrial importance, that have been prepared for the PRESS, will be published at the same time.

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Our U. S. and Foreign Patent Agency presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system and intimate acquaintance with the subjects of inventions in our new community. All worthy inventions patented through our Agency will have the benefit of a description or an illustration and explanation in the MINING AND SCIENTIFIC PRESS or the PACIFIC RURAL PRESS. We transact every branch of Patent business, and obtain Patents in all civilized countries. The large majority of U. S. and Foreign Patents granted to inventors on the Pacific Coast have been obained through our Agency. The files of cases and official records in our office, our patent law and scientific library (already the largest west of the Mississippi), are constantly increasing. These facilities, with the accumulation of information of special importance to our home inventors, by the experience of its proprietors in an extensive and long continued personal practice, gives them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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UNITED STATES
Mineral Land Laws, Revised Statutes
AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Surveys; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of $500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, postfree, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,
Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

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FAVORABLE LOCATION,
GUARANTEEING
Sure Crops Every Year.

The Reading Ranch,

In the Upper Sacramento Valley, originally embracing over 26,000 acres of

Choice Grain, Orchard and Pasture Land,

Is now offered for sale at low prices and on favorable terms of payment,

In Sub-Divisions to Suit Purchasers.

The ranch was selected at an early day by Major P. B. Reading, one of the largest pioneer and owners in California. It is situated on the west side of the Sacramento River and extends some 20 miles along its bank.

The average rainfall is about 30 inches per annum, and crops have never been known to fail from drouth.

The climate is very healthful and comparatively desirable. The near proximity of high mountain peaks gives cool nights during the "heated terms" which occur in our California summers.

Soft well water—remarkably sweet, pure and healthy—is obtainable at a depth of from 15 to 35 feet.

Wood is plentiful and easy to get.

Figs, Grapes, Peaches, Prunes, Almonds, English Walnuts, Oranges and other temperate and semi-tropical fruits can be raised with success on most of the tract. Also, Vegetables, Corn and all other cereals ordinarily grown in the State.

A considerable amount of the rich bottom land has already been cultivated.

Deep Soil With Lasting Qualities.

The soil throughout the tilled portions of the ranch proves to be of great depth and enduring in its good qualities. It is quite free from foul growths. The virgin soil among the large oak trees on the bottom land is easily broken up and cultivated.

The California and Oregon railroad traverses nearly the entire length of the tract. There are several sections, stations and switches, besides depots at the towns of Anderson and Reading—all of which are located within the limits of the ranch.

Land suitable for settlers in colonies can be obtained on good terms.

Are offered for sale in Reading, situated on the Sacramento River, at the present terminus of the railroad. It is the converging and distributing point for large, prosperous mining and agricultural districts in Northern California and Southern Oregon. Also, lots in the town o Anderson, situated more centrally on the ranch. Lots in both these towns are offered at a bargain, for the purpose of building up the towns and facilitating settlement of the ranch.

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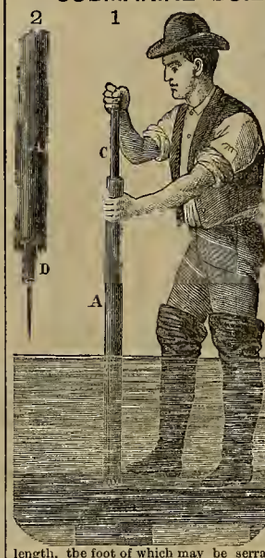

WILLIAM STACK, of Oakland, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus for driving nails or spikes under water, an engraving of which is here shown. It is well-known that it is extremely difficult to drive nails or spikes under water, even if it is only submerged a few inches. These difficulties are completely obviated by Mr. Stack's device, which has been put in thorough practical operation in the construction of wharves and slips in the Oakland side of the bay.

Fig. 1 shows the application of the device, and Fig. 2 shows the construction. *A* is a metal tube of suitable length, the foot of which may be serrated as shown, so that the points will engage with the wood when the tube is pushed or driven against it. The rod or driver, *C*, has a recess or cavity, *D*, at the lower end so as to rest on top of the nail or spike shown in Fig. 2. Where the tube, *A*, is pushed against the timber in the desired position, the spike or nail is dropped in at the upper end and slides down against the timber. The rod, *C*, is then slid down on top of the nail, and by alternately drawing out and forcing the rod into the tube, the rod serves as a driver; or by hammering on the upper end of the rod the nail is driven into the wood. The tube answers both as a guide for the nail and driving rod. The tube can also answer as a guide for a screw-driving device on the end of the rod, by which lag screws may be put in place under water as well as nails. Of course the tube may be set in any position desired, so that nails may be driven at an angle if necessary. The appliance, as simple as it is, will be found very useful in many cases for bridge building or similar purposes. Address,

WM. STACK,
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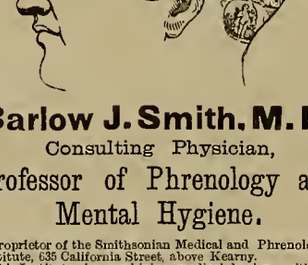

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DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHŒAL or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

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Yours respectfully, J. H. CAVANAUGH.
Walla Walla, Dec. 24th.

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SAN LORENZO, December 6th, 1877.

MESSRS. DEWEY & CO.—*Gentlemen:* I received the Letters Patent for my invention on the 5th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully, WM. DALE.

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DEFLECTORS,

Or Perkins vs. Hoskin.

H. C. PERKINS has for nearly two years been threatening orally and through the Press to prosecute all persons using my Patent Deflecting Nozzle, but for *good reasons*, has failed to come to time. I want miners to understand that Deflectors are still manufactured and sold, and that I will defend all suits and assume all responsibility. Mr. P. will confer a favor if he will carry out his threat, as it will afford me the opportunity I desire to again try the case, and he can rest assured that *professional dodges* will not again be allowed to *temporarily* thwart the ends of justice.

I feel confident that the Supreme Court of the United States will ultimately decide in my favor. The superiority of my invention is shown by the means which Mr. P has resorted to in trying to stop my sales. Mr. P. has so degraded himself as to circulate statements which he knows to be *false and malicious.* Notwithstanding the great number of my Deflectors in use, I have heard of but one accident, and this was caused by the breaking of the iron lever from a defect in the material and great carelessness in use. This circumstance Mr. P. has magnified into several deaths and numerous accidents. I refer to the following owners and Managers for testimonials as to safety and efficiency. Some of them have used and discarded Mr. Perkins' device in favor of my much superior one. Messrs. Gould, Gold Run, ushg 4; Spaulding, Dutch Flat, on different mines, 12; Stone, Gold Run, 2; Morgan, Little York, 6. Bisbee, Iowa Hill, 2; Briere & Wheeler, Bath, 2; McGillivry, Forest Hill, 4; Atkins, Weaverville, 2. 'I could mention scores of others, but these are sufficient.

Mr. Perkins' device is an infringement on a patent owned by Mr. Craig, who is about to institute legal proceedings to protect his rights. Miners are advised to stand from under. A word to the wise is sufficient. R. HOSKIN,

Manufacturer of Machines for Hydraulic Mining. Address, No. 29 Garden Street, San Francisco, or Empire Foundry, Marysville, Cal.

South Pacific Coast Railroad.

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Commencing Monday, September 30th, 1878, boats and trains will leave San Francisco daily from the New Ferry Landing, foot of Market street, at 5:30 A. M., 9:00 A. M., and 4:00 P. M. for ALAMEDA, SAN JOSE, LOS GATOS, ALMA, and all way stations.

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EXCURSION TICKETS will be sold Saturday afternoons and Sunday mornings from San Francisco and Alameda to San Jose, Los Gatos, and Congress Springs, and return, at reduced rates, good only until Monday evening following date of purchase.

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CAUTION

To Hydraulic Miners.

The public generally and Hydraulic Miners especially are hereby notified that any parties making or using the contrivance known as the HOSKIN DEFLECTOR will be prosecuted to the full extent of the law, said machine having been declared by the U. S. Circuit Court an infringement upon my patent, the

Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

HENRY C. PERKINS,
North Bloomfield, Nevada Co., Cal., October 1st, 1878.

Contents of Pamphlet on Public Lands of California, U. S. Land Laws, Map of California and Nevada, Etc.

Map of California and Nevada; The Public Lands; The Land Districts; Table of Rainfall in California; Counties and Their Products; Statistics of the State at Large.

Instructions of the U. S. Land Commissioners.—Different Classes of Public Lands; How Lands may be Acquired; Fees of Land Office at Location; Agricultural College Scrip; Pre-emptions; Extending the Homestead Privilege; But One Homestead Allowed; Proof of Actual Settlement Necessary; Adjoining Farm Homesteads; Lands for Soldiers and Sailors; Lands for Indians; Fees of Land Office and Commissions; Laws to Promote Timber Culture; Concerning Appeals; Returns of the Register and Receiver; Concerning Mining Claims; Second Pre-emption Benefit.

Abstract from the U. S. Statutes.—The Law Concerning Pre-emption; Concerning Homesteads; Amendatory Act Concerning Timber; Miscellaneous Provisions; Additional Surveys; Land for Pre-emption; List of California Post Offices. Price, post paid, 50 cts.

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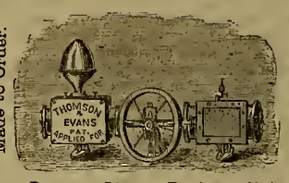

All Sizes of Gas and Tube FLANGES.

Steam Pumps, Steam Engines, Hoisting, Pumping, Quartz Mill, Mining, Saw Mill Machinery, Specialties.

Plans and Specifications for Machinery furnished. Repairing promptly attended to.

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Established 1844.

JOSEPH C. TODD,

ENGINEER
—AND—
MACHINIST.

Flax, Hemp, Jute, Rope, Oakum and Bagging Machinery, Steam Engines, Boilers, etc. I also manufacture Baxter's New Portable Engine of 1877, of one horse-power, complete for $125; can be seen in operation at my store. Two horse-power, $225; two and a half horse-power, $250; three horse-power, $275. Send for descriptive circular and price.

Address J. C. TODD,
10 Barclay Street N. Y., or Patterson, N. J.

THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per ton. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco.

Bodie Richmond Mining Co.

President, I. F. MILLER. Secretary, O. D. SQUIRE.

Incorporated November 16th, 1878.

Office, Room 28, Stevenson's Building, S F,

Continued from page 37.

quite soft, showing considerable clay in the seams of the rock. The north crosscut has been extended 48 feet. The formation is the same as last week. Will probably commence cutting station for the deep winze to be sunk from this drift by the last of the week.

MEXICAN.—Letter of the 11th says: On our 1600 level ths joint Union Con. winze has been sunk and timbered to a depth of 151 feet on the slope, 12 feet having been made during the past week. Material encountered coutinues hard blasting porphyry. On our 2000 level the main north drift has been advanced 41 feet; total length from our south lins, 145 feet. The material passed through has changed to hard blasting porphyry.

BELCHER.—Letter of tbe 11th says: Tbe east drift from station on 2560 level is in 33 fest. The short station sets are all in and one set of timbers in the station proper has been put in place, a chute has been cut out and one length of track laid. All this work, togetbar with the drift mentioned above, has been done during the week. The south drift on the 2360 level is now in 504 feet, having bsen driven and timbered 35 feet during the week. The sinking of the main incline has been resumed today.

BULLION.—Letter of the 13th says: Our incline shaft has been sunk 18 feet during the past week, making total depth on slops below 2050 level of 222 feet, material penetrated has been a mixture of porphyry and quartz of a softer nature than heretofore encountered, and which admits of better progress. The incliue is now 10 feet below the 2158 level, or 2000 level of the Imperial; 2000 level, north drift, has been advanced a distance of 20 feet during the past week; material has beeu soft porphyry which admits fair progress; 2400 level, branch drift, has been advanced 20 feet, making total length of same 37 feet. The ground penetrated has been hard vein porphyry, carrying occaeional streaks of quartz. The water in main drift is gradually decreasing.

HALE & NORCROSS.—Letter of the 13th says: On the morning of the 9th inst., connection was made with the Chollar-Norcross shaft. The total length of the 2000 east drift is 894 feet. We are now engaged in cutting out for a station on tbe west side of the shaft, which will he completed in a few days. The water stande today 22 feet below the 2000-foot station. The pumps at the C. N. S. shaft were started up yesterday pumping water into the Sutro tuunel. The machinery moved off splendidly, giving perfect satisfaction. All of our machinery is running well.

JULIA.—Letter of the 11th says: Owing to the increase of the flow of water discovered in the fore part of tbis week, but little progress has been made in the southwest drift 2000 level. Water shows no signs of diminishing; as soon as it is possible the work of advancing the drift will be resumed in order to develop the favorable veiu material which it shows in its face. Have repaired 856 feet on 1800 level south drift, cut drain and laid car track. Company'e main pump as well as the donkey pump are in excellent order, notwithstanding their increased working epeed.

EUREKA DISTRICT.

CHARTER COMPANY'S MINES.—Cor. Eureka *Sentinel*, Jan. 8: Their mines are located in the center of Eureka district. The main tunnel of the company—now 630 feet in length—is so situated as to develop nearly all the claims. It lies on a level 800 feet below a point where the company are now sinking a shaft in high-grade ore, on the Needle mine. Mr. Chas. Dehman, one of the present owners, located uearly all the claims of the company during the years from 1870 to 1875, and has held uninterrupted possession of them ever since. The tunnel is being pushed forward night and day, by contractors, in a southeast direction. A body of ore, giving assaye from $9 to $44 per ton, and showing a crevice of 15 feet, has just been cut through. The State Pride series, embracing in width 1,000 feet from north to south, embracing 11 locations, are now being pierced by the tunuel. Assays of ore taken from these mines have ranged from $20 to $894 per ton. The Fire-Fly, extending north and south, shows well-defined croppings five feet wide, and will be reached by the tunnel after it has passed through tbe State Pride series. The Monogram tunnel is 40 feet long, and prospecting shafts have proven the value of this claim, which is next in the series to be developed by the tunnel and crosscuts at a depth of 200 to 300 feet below the eurface. The Altai runs north and south, and shows large and well-defined surface croppings. It lies 600 feet west of and parallel with the well-known Grant mine, and adjoius the Needle. A shaft is being sunk on the Needle mine, and very fine ore is being taken out, which is of the same character as that found in the Grant, which joins it. A sample taken at the time of our visit gave an assay value of $549, and ore from this mine has assayed as high as $1,907. The Dehman mine is 500 feet north of the Needle, and shows the same character of ore. The Plummet series lie 2,000 feet south of the Grant, and comprise four parallel claims. A tunnel is now being run iuto this portion of the property, and very fair results have been shown from assays made of the ore. Adjoining the Plummet series, on the side next to the Charter tuunel, is the Peer mine, showing large, well-defined, contact cropings, lying between the limestone on the east and quartzite on the west. The Andalusia lies west of the Peer, and shows croppings over 15 feet wids, yielding very satisfactory assays. Eight hundred fest west is the Premium. Assays from workings on this property show from $40 to $500 per ton. A tunnel 50 feet long and a shaft 50 feet deep are run on a well-defined ledge of tbe Premier. The Coronet, near Prospect Mountain tunnel, has a shaft sunk 184 feet, showing at the hottom a crevice 10 feet wide, from which assays of $500 per ton have been ohtained. Already more than $25,000 in money have been expended.

PIOCHE DISTRICT.

PIOCHE.—*Record*, Jan. 4: The Hillside company shipped on the 29th of December 20,000 pounds of base bullion, the assay value of which was $537 per ton. Yesterday they also shipped 20,000 pounds, of about the same assay value. Nearly all the men employed at tbe Meadow Valley mine were knocked off Monday. We believe it is the intention of most of the men to go to work chloriding, on shares, in tbis mine. The Hillside furnace is still running successfully and turning out bulliou. Work continues at the mine with unabated vigor. The bullion product from the Pioche mines for the year 1878 amounted to $609,841.75. The Christy Mill and Mining Company shipped from Silver Reef on the 25th and 26th of December two bars of bullion valued at $3,531.30. Bullion valued at $6,785 was shipped from this place during tbe past week.

ARIZONA.

CASTLE DOME.—*Arizona Sentinel*, Jan. 4: A remarkable cavo has been found in the Railrosd mine. It is as large as an ordinary room, and adorned with stalactites and stalagmites which are completely encrusted with yellow crystals of lead molyhdate. This cave is at one side of the vein. The Arkansaw shaft ie now down about 350 feet, in excellent ore.

PICACHO.—The new 15-stamp quartz mill was started up on New Year's day. Some 250 tous of ore are on hand at the mill, and as much more is on dump at the mine. The reserves already developed are iuexhaustible. A contract bas been made with Mr. Clark, of San Bernardino, to haul 4,000 tons of ore from mine to mill at $1.80 per ton. His teams are due here ou the 15th. The quality of the ore was fully tested by the old five-stamp mill at work there last year; it was fouud to yield from $15 to $40 in free gold.

MULE PASS.—W. S. Edwards is now out there to make surveys and to have the necessary work done on the mincs recently bought by Corbin & Co. It is expected that the Eastern company referred to will soon erect machinery and go to work iu earnest.

AZTEC.—At the Aztec, under tbe superintendence of Mr. Hunter, a large number of men are at work erecting the mill and it is expected that it will before many weeks be in successful operation.

ARIVACA.—The mill owned by the St. Louis company that is being erected on the Arivaca is approaching completion. The Waterbury com pany, of Connecticut, has recently started work on several mines under the management of Mr. Kirkpatrick.

OREGON.

THE STEAMBOAT QUARTZ MINE.—Jacksonville *Sentinel*, Jan. 1: Says Richard Cook, one of the owners: A large vein of gold-bearing quartz has just been discovered, assaying from $22 to $90 per ton. Messrs. Cook & Herd have doue about $500 worth of work during the past season. An effort is now being made to organize a stock company to work the ledge.

THE LUCKY QUEEN RENTED.—*Independent*, Jan. 1: The Lucky Queen mine has heen rented for a period of one year to a Mr. Rodebaugh, an experienced miner, who, after practical tests, is satisfied he can work the ore with profit.

UTAH.

SILVER REEF.—Enreka *Sentinel*, Jan. 8, quoting Cor. Ward *Reflex*: Speaking of San Francisco district, the writer says: "The distance from Ward is about 135 miles. The miners in Frisco were mostly idle, bnt said they would soon be on again in a few days. Merchandise is about five per cent. less here than in Ward, and costs the merchants from 10% to 20% less to lay it down here than in Ward. Business appears to be good, but chloriders say the mill companies get away with all the profits."

Salt Lake *Tribune*, Jan. 8: J. E. Clayton has returned from Silver Reef, where he has heen examining the silver-sandstone grindstones. The Professor regards it as a rich and interesting country.

FRISCO.—Cor. Salt Lake *Tribune*, Jan. 8 Everybody seems to he awaiting a change of ownere of the big mine. Both smelters shut down during the holidays. Campbell, Cullen & Co. started up on the 1st. Godbe & Co. are making some very needful improvements and relining. They will start up on the 10th of the p resent month.

THE PHYLLOXERA IN PORTUGAL.—The telegraph announces that the Portuguese government, in alarm at the ravages of the phylloxera in the proviuce of Douro, has directed local commissions to make careful investigation and iustruct vineyardists in the best modes of resisting the attacks of this foe.

THE ice blockade in the Columbia and Willamette rivers, Oregon, still continues.

The Discoveries of Scienoe in 1878.

[From our Regular New York Correspondent.]

The closing days of the year 1878 naturally suggest a retrospcctive glance at the many notable events in the realm of science, which must forever mark it as one of the most important eras in which man has made wonderful advances in bis knowledge of nature.

With the dawn of the year came the double announcement of tbe discovery of the liquefaction of oxygen by the great Frsnch scientists, Pictet and Cailletet, who curiously both arrived at the same results by processes perfectly different. If any priority should be given for the solution of this problem, it must be awarded to M. Cailletet, who recorded the fact on the 2d of December; but being a candidate for a seat in the Academy of Science, he consigned the account of his discovery to a sealed packet, which was opeued at the academic session of Decsmber the 24th, the very day M. Raoul Pictet's lstter arrived, anuouncing his succsss.

On the opening day of the year 1878, M. Cailletet accomplished the liquefaction of hydrogen, nitrogen and atmospheric air; and, but a few days after this, January 11th, M. Pictet effected the solidification of hydrogen, which proved to be a metal, a fact that was forsshowed 40 years ago, by thsoretical calculations, by M. Dumas.

As a sequsnce to these important discoveries, the closs of the year brings with it the recent discovery, by Mr. J. Norman Lockyer, that all the 64 so-called elements are merely condensations of, or modifications of a single primitive form of matter, that being hydrogen. It ie yet early to predict the full effect of Mr. Lockyer'e discovery, for as yet it has not been confirmed by others. In some of Mr. Lockyer's last experiments with the spectroscope, he appears to have even effected the transmutation of the metals, and thus accomplished the wildest dreams of the alchemist; for he found that the result of the decomposition of copper gave the spectrum of tin. It yet remains to be proved that the interpretations of the spectroscope were correct, but even if no error is discovered and Mr. Lockyer's discoveries are, in reality, what he represents them, the limit to which the results can he carried should be elearly understood. It may be possible to rednce gold and other precious metals to hydrogen, but it will never be possible to make gold from hydrogen, although such a result might appear to follow, the reason being that one of the factors in the formation of metals ie not within the control of the chemist. As an example, it has been suggested that it is easy to reduce coal to ashes, but to reconstruct coal from ashes is not to be accomplished.

The year 1878 will ever be associated with the name of Thomas A. Edison, for during this year the introduction of old, and perfecting of new inventions of a scientific character, has attracted the attention of the whole civilized world. It would be a waste of time on my part to describe the phonograph (now much improved), megaphone, phonometer and the acrophone, and the tbree great acbievements of his geniue, the improved carbon telephone, the tieimeter and the electric lamp. Of the latter I shall probahly epeak in detail in my next letter.

Of the discovery of an intro-mercurial planet by Lewis Swift and Prof. Watson, but little can he said, as probably the astronomical world will wait further confirmation of their existence, before finally accepting their presence as a fact. Not from any want of confidence in the observations of Messrs. Swift and Watson, but from the recognized difficulties under which the observations were made, permitting the possibility of error.

Space will not permit a more extended survey of the ecientific work of the year 1878, the details of which will be found in the usual annual works published for that purpose. But among the names of those workere whoee work justly entitles them to honorable mention, may he mentioned with pride, our countryman Prof. Graham Bell, in perfecting hie telephone; Mr. Stearns, in "duplexing" the Atlantic cable; of Prof. Alfred M. Mayer, in illustrations of the atomic theory by floating magnets; of Sir J. D. Hooker and Paul Bert, in their discoveries in vegetable chemistry; of Prof. Leconte, in his discovery of a new element; of Profs. Newlauds, Wilde and others, in their ingenious classifications of the elements by periodic lawe; and of Loutin, Rapieff, Jablochkoff, Werdermaun and Sawyer.

On taking a general survey of the scientific work of the year now closing, all interested in real progress must view with satisfaction the marked change in the tone of scientific eommunications and work. No longer the discussion of remote and wild hypotheses claim the attention of the scientific world; those who rack their brains trying to eolve the probabilities of impossibilities, appear to have fallen to the rear, while *au contraire*, the laboratory and the work shop, are once more proving their utility, and give a healthful tone to scientific inquiry and discovery. JOHN MICHELS.

New York, Dec. 30th, 1878.

THE Carson papers report ex-Governor L. R. Bradley as seriously sick with hemorrhage of the lungs.

THE Japanese are apprehensive that Russia intends to annex Yesso.

Science Bearing on Rainfall.

Mr. Lemmon, in his article describing "Scenes in the High Sierra, back of Yosemite," this week (page 34), speaks lovingly of the glaciers, and of the ice, the sight of whose cool grssn edges has done good to his, and to many another mountain tourist's eyes. Studying the retreat of the glaciers, he sighs at the thought of the torrid and moistureless air melting still further away the few short glaciers that are left in the Sierra, to their sources.

Which brings up the question whether we have not turned the corner in the eosmic economy, and are already having an increase of rainfall, and, of course, snowfall, in the mountains, with its accompanying *neve*, and its ice packing, where the conditions for glaciers exist. This matter came up before ths Geological Sscion of the Academy of Sciences, at its last mesting, on Saturday, the 11th inst—a full report of which will appear in the MINING AND SCIENTIFIC PRESS,—and was very ably discusssd by Joseph Le Coute; Clarencs King's foundation for believing in that hypothssis bsing cited along with other interesting facts, by the participants in the discussion.

In our next issue Mr. Samuel Purnell begins a ssries of several articles in which he will tell our readsrs what is known about the sun-spot cycle of 11 1-9 years, in connection with ths rainfall of the coast. Geological and astronomical science have both established in these linss of investigation, a most practical bearing.

Life Insurance.

The John Hancock Mutual Life Insurance Company of Massachusetts, has lately established an agency for the Pacific coast at 417 California street, under the management of J. S. Byington. This gentleman is highly recommended to us by trustworthy frieuds at the East, and we call the attention of those eeeking life insurance to his company. It will doubtless obtain its share of the business done in this line on this coast. It is well known that the Massachusetts laws governing life insurancs, in certain important features, are in advance of those of other States, as for instance in protecting the insured against nnjust forfeiture of policies. The following quotation from the circular of the John Hancock Co., in a measure explaine this feature:

"The theory of the Massachusetts law is to give each policy-holder the benefit of this overpayment, *without any action on his part, and as a matter of right secured by law*, by continuing the policy in force beyond the date of lapse, until the annual cost of insurance has exhausted the reserve accuuulated while the policy was in force. In other words, insurance is guaranteed by the laws of the State at natural, term, or actual cost-rates, for all the money paid on any policy issued by a Massachusetts company.

"In practice, 20% of the net reserve at date of lapse is withheld, by the law, as a fair allowauce for the future expenses chargeable to the policy; and the remainder, or 80%, is applied to pay for the continuance of the insurance at term rates. If death should occur during the term over which the policy is continued in force, the whole amount insured at the date of lapse, less 'the amount at 6% per annum of the premiums that had been forborne at the time of death,' and all dividends accrued on the policy, are paid the heirs. It is better than a contract, because the language of the Statute is clear and explicit, and not liable to judicial construction adverse to the rights of the policy-holder."

THE DUTY OF THE HOUR.—Lest any reader should forget it, we mention the peculiar fitness of the season for renewing old subscriptions and making new ones to the PRESS. In going forward with our journal, we need the help of our patrons both with mind and money. Do no forget to send the printer his due, as tbe aggregate of small individual amounts will give him a force that will make tbe types fairly dance into the lincs. We trust that only a hint will be needed to rally the dollars, for with them assured we bave a thousand themes to occupy our columns. Let all step up promptly to the Captain's office and tben we will go out on deck for another year's voyage —*January 1st, 1879.*

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SETTLERS and others wisbing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Sbasta County, Cal., who has some 15,000 acres for sale in tbe Upper Sacramento valley. His advertisement appears from time to time in tbis paper.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

ARTESIAN WELLS WANTED.—Parties wbo are prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of tbe Reading Ranch, Anderson, Shasta County, Cal.

EXPERIMENTAL MACHINERY, drawiugs, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

HENRY R. EWALD is our general eorrespondent and agent for Arizona.

Chew JACKSON'S BEST Sweet Navy Tobacco

Mining and Other Companies.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte County, California

Notice is hereby given, that at a meeting of the Board of Directors, held on the 24th day of December, A. D., 1878, an assessment (No. 40) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of January, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 18th day of February, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary

Office, 318 Pine Street, Room 6, San Francisco California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of January, 1879, an assessment (No. 15) of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the Company, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal., or the Assistant Secretary at the office No. 9 Nassau St., New York, N. Y.

Any stock upon which this assessment shall remain unpaid on the twelfth day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the twelfth day of March, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Sec'y.

Office, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

Mineral Fork Mining and Smelting Com-

pany.—Location of principal place of business, San Francisco, California. Location of works, Big Cottonwood District, Salt Lake County, Utah Territory.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 31st day of October, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
G Areskog	156	50	$ 1 00
G Areskog	157	50	1 00
W H Atwood	185	100	2 00
W H Atwood	186	100	2 00
W H Atwood	187	100	2 00
W H Atwood	188	100	2 00
W H Atwood	189	100	2 00
Wm Atwood	190	100	2 00
Wm Atwood	101	100	2 00
Wm Atwood	102	100	2 00
Wm Atwood	103	100	2 00
Wm Atwood	104	100	2 00
G Bearson	105	100	2 00
G Bearson	115	100	2 00
G Bearson	116	100	2 00
G Bearson	117	100	2 00
G Bearson	118	100	2 00
G Bearson	110	100	2 00
G Bearson	136	66	1 32
H L A Culmer	295	50	1 00
H L A Culmer	296	50	1 00
H L A Culmer	297	100	2 00
H L A Culmer	298	100	2 00
H L A Culmer	299	100	2 00
Wm H Culmor	378	10	20
Wm H Culmer	379	50	1 00
Wm H Culmer	380	50	1 00
Chs G Denicke	434	50	1 00
Chs G Denicke	435	50	1 00
Chs G Denicke	436	50	1 00
Chs G Denicke	437	50	1 00
A S Easton	4	75	1 50
A S Easton	365	350	7 00
E E Elliott	195	100	2 00
E E Elliott	106	100	2 00
E E Elliott	107	100	2 00
E E Elliott	198	100	2 00
E E Elliott	201	17	34
E E Elliott	271	25	50
E E Elliott	272	25	50
E E Elliott	274	10	20
E E Elliott	275	10	20
E E Elliott	217	50	1 00
E E Elliott	218	50	1 00
E E Elliott	220	50	1 00
E E Elliott	222	200	4 00
E E Elliott	224	200	4 00
E E Elliott	225	200	4 00
E E Elliott	226	200	4 00
E E Elliott	228	200	4 00
E E Elliott	229	200	4 00
E E Elliott	230	200	4 00
E E Elliott	231	200	4 00
E E Elliott	233	100	2 00
E E Elliott	234	100	2 00
E E Elliott	371	50	1 00
E E Elliott	372	50	1 00
E E Elliott	373	50	1 00
E E Elliott	374	50	1 00
E E Elliott	375	100	2 00
E E Elliott	376	100	2 00
E E Elliott	377	100	2 00
E E Elliott, Trustee	503	10	20
E E Elliott, Trustee	504	10	20
E E Elliott, Trustee	505	10	20
E E Elliott, Trustee	506	10	20
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E E Elliott, Trustee	541	50	1 00
E E Elliott, Trustee	542	50	1 00
E E Elliott, Trustee	543	50	1 00
E E Elliott, Trustee	544	50	1 00
E E Elliott, Trustee	545	50	1 00
E E Elliott, Trustee	546	50	1 00
E E Elliott, Trustee	547	50	1 00
E E Elliott, Trustee	512	10	20
W W Elliott	208	100	2 00
W W Elliott	209	100	2 00
W W Elliott	210	100	2 00
Frank Foote	381	250	5 00
B A M Troisith	508	20	40
B A M Troisith	509	20	40
Edwin Gardner	202	100	2 00
Edwin Gardner	203	100	2 00
Edwin Gardner	204	100	2 00
Edwin Gardner	205	100	2 00
Edwin Gardner	206	100	2 00
S J Jonasson	181	25	50
S J Jonasson	182	25	50
S J Jonasson	184	67	1 34
Peter Jhonson	333	100	2 00
Peter Jhonson	334	100	2 00
Peter Jhonson	336	100	2 00
Peter Jhonson	338	100	2 00
Peter Jhonson	340	100	2 00
Peter Jhonson	342	100	2 00
Peter Jhonson	346	50	1 00
Peter Jhonson	348	50	1 00
Peter Jhonson	349	50	1 00
Peter Jhonson	350	50	1 00
Peter Jhonson	351	50	1 00
Peter Jhonson	353	50	1 00
Peter Jhonson	354	50	1 00
Peter Jhonson	355	50	1 00
Peter Jhonson	357	50	1 00
Peter Jhonson	358	50	1 00
Peter Jhonson	359	50	1 00
T F Nystrom	247	100	2 00
T F Nystrom	248	100	2 00
T F Nystrom	249	50	1 00
T F Nystrom	250	50	1 00
T F Nystrom	251	33	66
R B Noyes	270	300	6 00
Samuel Purdy	259	100	2 00
W C Pease, Trustee	607	18	36
W C Pease, Trustee	608	18	36
G Peterson	75	100	2 00
G Peterson	85	100	2 00
G Peterson	87	100	2 00
G Peterson	88	100	2 00
G Peterson	80	100	2 00
G Peterson	96	50	1 00
G Peterson	100	50	1 00
G Peterson	102	50	1 00
William Russell	276	10	20
William Russell	277	5	10
William Russell	278	5	10
P H Sumuor	19	5	10
P H Sumner	20	70	1 40
P H Sumner	180	66	1 32
Edgar Sheldon	201	250	5 00
Edgar Sheldon	202	250	5 00
Edgar Sheldon	203	250	5 00
Edgar Sheldon	204	250	5 00
F C Thompson	243	50	1 00
F C Thompson	244	50	1 00
F C Thompson	245	33	66
Theodore Tangwell	328	50	1 00
C F Winslow, Trustee	555	500	10 00
C F Winslow, Trustee	556	277	5 54
C F Winslow, Trustee	561	50	1 00
C F Winslow, Trustee	562	100	2 00
C F Winslow, Trustee	563	100	2 00
C F Winslow, Trustee	564	100	2 00
C F Winslow, Trustee	565	100	2 00
C F Winslow, Trustee	566	100	2 00
C F Winslow, Trustee	567	50	1 00
C F Winslow, Trustee	570	250	5 00
C F Winslow, Trustee	571	250	5 00
C F Winslow	237	5150	103 00
C F Winslow	301	1000	20 00
C F Winslow	308	1700	34 00
C F Winslow	300	1000	20 00
C F Winslow	310	1000	20 00
C F Winslow	311	1000	20 00
C F Winslow	312	1000	20 00
C F Winslow	314	250	5 00
C F Winslow	318	100	2 00
C F Winslow	324	100	2 00
Ronde N Walter	246	84	1 68
A Winguist	56	100	2 00
A Winguist	62	100	2 00
A Winguist	66	50	1 00
A Winguist	67	50	1 00
A Winguist	68	50	1 00
A Winguist	60	50	1 00
A Winguist	70	50	1 00
William Schade	24	50	1 00
William Schade	25	50	1 00
William Schade	53	100	2 00
William Schade	54	100	2 00
William Schade	55	100	2 00
Otto Metchke, Trustee	609	14	28

And in accordance with law, and an order of the Board of Directors, made on the 31st day of October, 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, Room 20, Safe Deposit Building, No. 323 Montgomery Street, San Francisco, California, on Monday, the thirtieth (30th) day of December, 1878, at the hour of 12 o'clock M. of said day, to pay delinquent assessment thereon, together with costs of advertising and expenses of the sale. OTTO METCHKE, Secretary.

Office, Room 20, Safe Deposit Building, No. 328 Montgomery St., SanFrancisco, California.

POSTPONEMENT.—The above sale has been postponed until Thursday, the 30th day of January, 1870, at the same hour and place. By order of the Board of Directors. OTTO METCHKE, Secretary.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6,) levied on the 10th day of November, A. D., 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Boring, I C	32	1200	$60 00
Bohn, John	150	200	10 00
Lehmann, C	129	2750	137 50
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Storer, J F, Trustee	58	250	12 50
Schmitz, F	205	400	20 00
Turner, J W	65	200	10 00

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of November, A., D., 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, Cal., on Tuesday, the fourth day of February, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 0, No. 318 Pine Street, San Francisco, Cal.

DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of seven and one-half (7½) per cent. per annum, and on Ordinary Deposits at the rate of six and one-fourth (6¼) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of January, 1879. By order.

GEORGE LETTE, Secretary.

San Francisco, December 31st, 1878.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
F. LESTER ..... Acting Manager.
CHAS. H. GODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

Open Every Evening with the Regular Company.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lessee and Manager

CALLENDER'S GEORGIA MINSTRELS.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR ..... Manager.
BARTON HILL ..... Acting Manager

JOHN T. RAYMOND.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

STANDARD THEATER.

M. A. KENNEDY ..... Sole Lessee and Manager.

RICE'S SURPRISE PARTY.

Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

NATURE'S TRIUMPH!

CALIFORNIA

ROOT TEA

Is without a parallel in medicine. The most important discovery ever made in any age or country. It is the only perfect Liver and Blood Medicine ever known, has a powerful and heretofore unheard of influence on the circulation, and is extremely desirable in all forms of debility, local or general, and weakening and wasting diseases, effecting many astonishing cures when all else fails. It effects permanent cures of Blood Diseases which all the old Blood Medicines and the most powerful drugs fail to touch. A continuous influx of testimonials are daily pouring in from all sources.

Mrs. Lydia Read's Cure.

SAN FRANCISCO, January 13th, 1879.

DEAR SIR:—I feel it my duty to inform you what the California Root Tea has done for me, and think you ought to publish it for the benefit of others. I had been failing in health for years, and in spite of all the different treatment I underwent and medicines I swallowed had sunk so low that I could hardly walk across the floor, and felt that my time had come. When in this condition a few weeks ago the California Root Tea was recommended to me by a friend and I began its use. Its effect was most astonishing; it seemed *to actually build me up* from the start, and I am now as strong and hearty as ever. I am confident and so are my friends that had it not been for the California Root Tea I should now be in my grave. [Signed] MRS. LYDIA READ, 1843 Howard Street.

NOTE.—Mrs. Read's complaint was impoverishment of the blood, feeble circulation and a steady and persistent decline that defied the best physicians. For many such complaints there is no possibility of cure with anything heretofore known in medicine. Mrs. Read has resided at her present home for years, and is well known throughout the city as a lady of education and high standing.

The CALIFORNIA ROOT TEA is sold in packets, in its vegetable form. Each 50 cent packet makes a pint of balsam; dose, 2 spoonfuls 3 times daily. Any child prepares it in 10 minutes. Directions inside each packet.

All respectable Druggists and Grocers throughout the country sell it.

PALACE RESTAURANT

218 Sansome St.

This elegant and spacious Restaurant has been re-opened, with Good Living superior bill of fare daily, at 218 Sansome Street, S. F., and is now the best and Reduced Prices most popular dining saloon on this Coast.

[Lunch ready at 10 A. M.] Resident business men and visitors from abroad will be wise in giving this place an early call. Examine bill of fare and prices.

HERMAN H. HORST, Prop'r.

DEFLECTED HEAT!

Boswell's Combined Heater, Cooker, Baker. Clothes and Fruit Drier.

Combining the advantages of a Stove, Furnace, Oven, Dry House and Kitchen Range. An application of Scientific Principles to the economy of living, of labor, of health and of comfort. A handsome piece of Furniture adapted to the wants of every family. It equally economizes time, labor and fuel, and avoids exposure to heat in cooking as well as in baking. It bakes Bread, Cakes and Pies to any desired tint without turning or watching, or danger of burning. All odors produced in cooking are passed up the flue. Food cooked by deflected heat is improved in flavor, more easily digested, contains more nutriment, will keep fresh longer, and is also much improved in appearance. The stages of the cooking or baking can be seen without stooping or opening the doors of the oven. It will dry and bleach your clothes in from half an hour to one hour and a half, and heat your irons.

Fruit dried in the Boswell will gain from TWENTY to FORTY PER CENT. in WEIGHT, and THIRTY PER CENT. in QUALITY over that dried by any other process. It will successfully dry any kind of Fruit, Grapes, Berries, Meats, Fish, Vegetables, Coffee, Tobacco, Corn and Grain of all kinds.

— ALSO —

Boswell's Commercial Fruit Drier,

Used exclusively for drying and heating purposes ON A LARGE SCALE.

— ALSO —

BOSWELL'S CABINET HEATER,

Of all sizes and capacity for heating Private Residences, Hotels, Halls, School Houses, Churches, Offices, Stores, Railroad Cars, Hospitals, etc.

All of which can be operated successfully by a mere child, it is so simple in its construction, and with one-third the usual amount of fuel (coal or wood), used in any other heating, cooking or drying apparatus.

Every farmer and economical housekeeper should use it. It will pay for itself in the saving of fuel; it will pay in the superior character of its FRUIT DRYING, of its COOKING, ROASTING and BAKING; it will pay in its salubrious and healthful warm air; it will pay the rich and the poor alike.

Address, for Price List and descriptive illustrated circulars,

Boswell Pure Air Heater Co.,

No. 606 Montgomery Street, San Francisco, California.

S. R. LIPPINCOTT, Secretary.
EUGENE L. SULLIVAN, Pres't.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manfuactory. 17 & 19 Fremont St., S. F.

FOR SALE.

SEVERAL SECOND-HAND

PORTABLE ENGINES,

FOR SALE CHEAP.

Sizes, from eight horse-power to twenty-five horse-power. IN PERFECT RUNNING ORDER. Apply to

JOSEPH ENRIGHT,

San Jose, California.

Mill and Mining Machinery

OF ALL KINDS FOR SALE BY BERRY & PLACE

At the Old Stand, Market, head of Front Street, S. F.

HEMORRHOIDS OR PILES,

A treatise on their scientific treatment and radical cure, by E. J. FRAZER, M. D., San Francisco. Price, 25 cents; for sale at the bookstores and by the author at 221 Powell street. Sent by mail to any address on receipt of the Price in coin, currency or postagestamps.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

Firet St., between Howard & Folsom, S. F.

WM. H. BIRCH. JOHN ARGALL.

California Machine Works,

BIRCH, ARGALL & CO.,

119 Beale Street, San Francisco.

☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

California Brass Foundry,

No. 125 Firet Street, Opposite Minna.

SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shaftiug, Iron Tanks, etc. For sale at ths lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

UNION IRON WORKS.

Office, 61 First St. | Cor. First & Mission Sts., S. F. | P. O. Box, 2128.

BUILDERS OF

Steam, Air and Hydraulic Machinery.

Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES, HORIZONTAL ENGINES, AUTOMATIC CUT-OFF ENGINES, COMPOUND CONDENSING ENGINES, SHAFTING, BABY HOISTS, VENTILATING FANS, ROCK BREAKERS, SELF-FEEDERS, PULLEYS, STAMPS, PANS, SETTLERS, RETORTS, ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO.

HAWKINS & CANTRELL,

MACHINE WORKS,

210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturere of

IMPROVED PORTABLE

Hoisting Engines,

For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery.

Pacific Rolling Mill Co.,

SAN FRANCISCO, CAL.

MANUFACTURERS OF

RAILROAD AND MERCHANT IRON,

ROLLED BEAMS, ANOLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

☞ Ordere Solicited and Promptly Executed. Office, No. 16 FIRST STREET.

Fulton Iron Works.

Hinckley, Spiers & Hayes.

(ESTABLISHED IN 1855.)

Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

Mining Machinery.

Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating ths same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

PACIFIC IRON WORKS,

First and Fremont Streets, between Mission and Howard, San Francisco, Cal.,

RANKIN, BRAYTON & CO.,

Manufacturers of

ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, Etc., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Bailey Air Compressor, Howell's Improved White Furnaces, Walker's Compound Steam Pumps, Etc.

Western Iron Works,

316 and 318 Mission Street, San Francisco,

PERRY EDWARDS, Prop'r.

Manufacturer of Wrought Iron Girders, Trusses, Prison Cells, Iron Roofs, Crest Railings, Finials, Fences, Weathervanes, Gratings, Iron Work for Models, Etc.

Nickel Plated Railings. Bank and Store Fittings. Estimates given and Iron Work furnished for Buildings.

Dewey & Co. { 202 Sansome St } **Patent Ag'ts.** | DRIVING NAILS UNDER WATER.—Stack's illustrated advertisement appears once a month in this paper.

THE RISDON IRON AND Locomotive Works

Corner Beale and Howard Sts.,

SAN FRANCISCO, CAL.

W. H. TAYLOR, Pres't. JOSEPH MOORE, Sup't.

Builders of Steam Machinery

IN ALL ITS BRANCHES,

Steamboat, Steamship, Land

Engines and Boilers,

HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complets with Hulls of Wood, Iron or Composite.

ORDINARY ENGINES compounded when advisable.

STEAM LAUNCHES, Barges and Steam Tugs constructed with refsrence to the Trads in which they ars to be employed. Speed, tonnage and draft of water guaranteed.

STEAM BOILERS. Particular attention given to the quality of the material and workmanship, and nons but first-class work producsd.

SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therswith.

WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, or sheets rolled, punched, and packed for shipment ready to be riveted on the ground.

HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, riveted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.

SHIP WORK. Ship and Steam Capstains, Steam Winches, Air and Circulating Pumps, made after ths most approved plans.

PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

— AT THE —

Electric Model & Machine Works

Inventore and others can get First-Clase Work at Moderate Prices.

After 10 years experience with inventions and other mechanical work, I am fully prepared to execute drawings, working-models and fino machinery of any description to entire satisfaction.

Brass Finishing, Pattern Making, Gear Cutting, Telegraphic and other Electrical Apparatus by competent workmen.

TELEPHONES TO ORDER.

F. W. FULLER, 415 Market Street, San Francisco, Cal.

Main Street Iron Works,

WM. DEACON, PROPRIETOR.

Noe. 131, 133 & 135 Main St., San Francieco.

Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

SAW MILLS and SAW MILL MACHINERY.

Double C. Reversible. 5½x12, 6x12, 7x12, 8x12, 9x14, 10x14 — ALL SIZES Hoisting Engines FOR SALE BY BERRY & PLACE — 7x12, 8x12, 9x14, 10x14

Market, head of Front Street, San Francisco.

Steel Castings.

From ½ to 10,000 lbs. weight, true to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO.,

EVELINA STREET, - - PHILADELPHIA, PA.

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information giveu upon application.

A. J. SEVERANCE & CO.

Office, No. 320 Sansome street, Room 10.

GOLD MINE WANTED.

One now paying more than expenses. Address

W. S. KEYES, M. E.,

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EDISON'S ELECTRIC PEN and PRESS.

MAKES 5,000 COPIES FROM ONE WRITING.

Requires no Prepared Ink, or Paper, no Skilled Expert to do Good Work From 5 to 15 Copies per minute by an Office Boy.

Indispensable to Lawyers, Bankers, Colleges and Schools, Music Dealers, Real Estate Men, and Business Firms in every department of trade.

Costs but $2.50 Per Annum to run it.

WHAT THEY SAY:

"As good as a full-grown lithographic establishment."—Baker & Hamilton.
"Indispensable to the use of this office."—Fireman's Fund Insurance Co.
"Exceeds our most sanguine expectations."—Hy Balzer & Co.
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Call on, or send for Circular and Samples of work to

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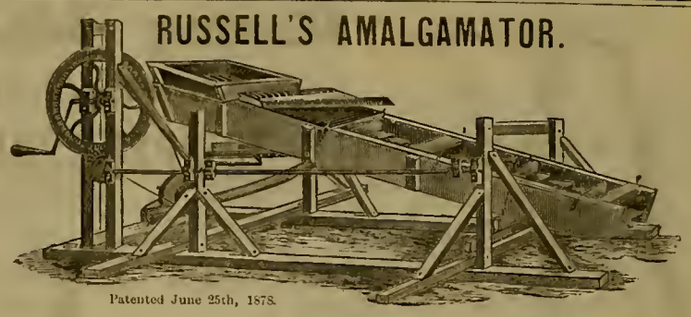
RUSSELL'S AMALGAMATOR.



Patented June 25th, 1878.

SAVE YOUR GOLD

And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

IS GUARANTEED TO SAVE THE FINEST OR FLOAT GOLD.

Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

J. MORIZIO, Gen'l Agt.,

Room 24, Safe Deposit Building, Corner Montgomery and California Streets, SAN FRANCISCO.

Ingersoll Rock Drills.

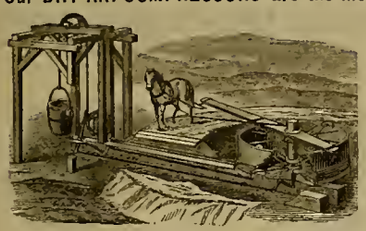
In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

Has less Repairs.

Is Lighter and more Easily Adjusted than any other Drill.

Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

REYNOLDS, RIX & CO., 18 & 20 Fremont St., San Francisco.

ELECTRIC LIGHT.

BRUSH PATENT.

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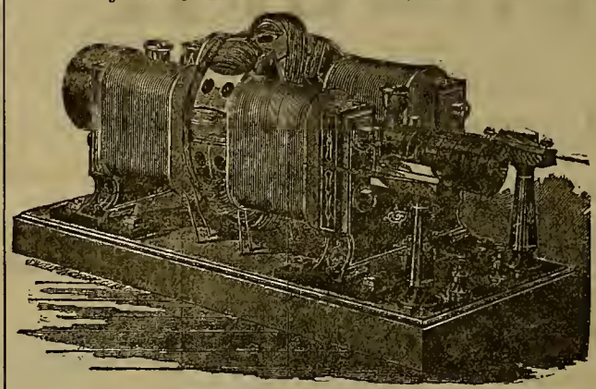

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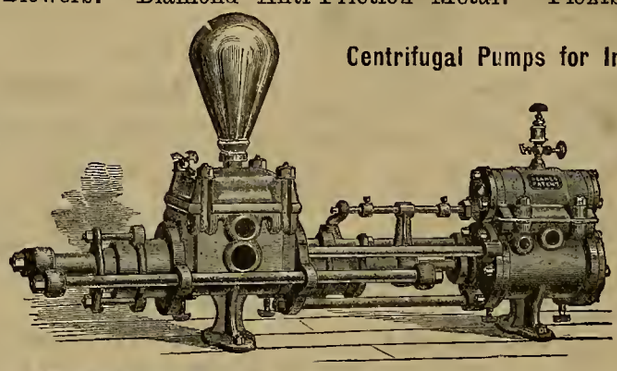

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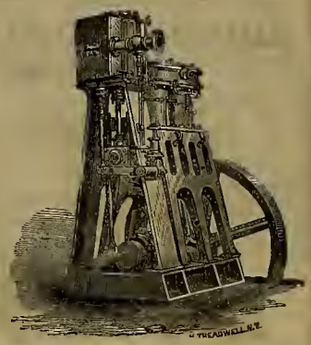

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The Annoying Thumb-Screws are Entirely Done Away With.

We Make Seven Sizes, as follows:

Number or Pints.....	1	2	3	4	5	6	10
Holds Pounds Quicksilver..	12½	25	38	50	63	75	125
Weight each.....10lbs	15	18	25	31	44	65	

Mortars and Pestles,

GROUND INSIDE.

Size—Quarts.....	½	1	2	4	6	8	12	16
Hight—Inches ...	3½	5	6	7½	8½	9	11	1
Weight—Pounds .	6½	9	16	22	37	43	72	86

Bullion Ladle.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JANUARY 25, 1879.

VOLUME XXXVIII Number 4.

The Little Wonder.

We illustrate herewith a self-calculating sample and button weigher, for prospectors and assayers' use, a patent for which has just been obtained through the MINING AND SCIENTIFIC PRESS Patent Agency, by Mr. J. S. Phillips, the well known author and mining engineer of this city. It is a combination in one device, of weighing scales, balances, weights, forceps, calculating tables, or scales, by which the inventor provides a simple and ready apparatus, with which the prospector can accurately determine the dollars per ton in gold and silver, as well as the fineness and percentage. It is well named "The Little Wonder."

The stand or case is made of metal, and has an open top and ends. Across the center is an upright gripping piece, in which is an inverted knife edge, on which the beam is balanced. This metal beam has at one end and forming a permanent part of it, a conical platinum cup, and at the other end a small knife-edged crook, on which may be hooked a little pan. To balance this aluminum pan when attached to the crook by a hook and silk cord, a balance-clasp is put on the beam. This clasp is shown snapped on to the forceps ready for use. When balanced by the clasp the pan can be used for weighing the sample bullion, and buttons in the usual manner.

On the back of the case are two lugs, *L*, which hold the beam in position, when it is not in use. The knife-edge, on which the beam rests, extends to the back of the case; and by sliding the gear back and slightly springing the ends under the lugs, it is held firmly in place. The gudgeon piece or inverted knife action is shown in the center of the beam. The weights for use on this beam are made in the form of riders, and are kept in the weight case, *W*, which has a cover, as shown, to keep them in place. On the beam is fitted a permanent adjunctory or regulating paper disk weight, which may be slid back or forth. The riders or weights are of different colors, for easier discrimination.

On the inside of the case, under the beam, is placed a scale, marked or printed on paper with properly marked cross lines, which in combination with the different colored and weighted riders, will give the value in gold or silver bullion in dollars and cents, without the necessity of figures or any calculation whatever on the part of the operator, who is not even required to read figures as none are used.

The front part of the stand is turned over to form a circular hollow side, inside of which is placed the large bar weight, used as a balance for samples of ore. The heavy beam is made semi-tubular at its center, and on its closed side is made a diamond-shaped slot (shown in engraving) by which the beam is kept in proper position on the knife top when in use. Two large pans, *P*, are used with this beam and are suspended from its ends by hooks and silk cords. This beam is used for weighing samples of auriferous quartz and large silver assays. These pans have only two sides, which when not in use fit under the stand or case, the sides projecting upward as shown, so as to encircle said case. The three weights used with these pans are made of different sizes and colors. They are made of wire rod bent into S C shape, indicating that they are self-calculating weights. These are used for weighing the samples to be assayed, the resultant button being weighed on the other beam by the other weights as described.

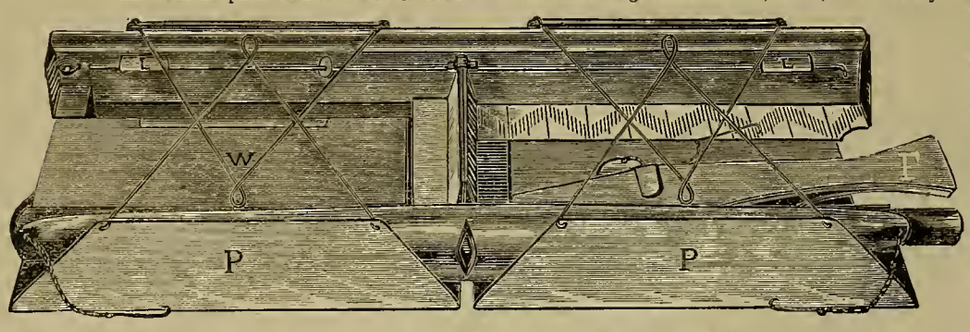
By weighing a sample of bullion or base metal ore to equal either of the riders, or any other quantity, by a rider-shaped weight, the thousandth fine of such metals, or percentage of such ores may be known at sight after cupellation or reduction, by simply placing each of the several resultant buttons in the cup, and sliding the same rider to correct the balance upon the other end of the beam opposite the appropriate scale.

It will be readily seen that by taking suitable quantities as provided by the large yellow bar for gold, and the yellow S C weight for silver, not only the percentage and thousandths fine may be obtained as above, but also the value in dollars per ton for gold and silver, the same scale being common to all fire methods of assaying.

This device is extremely portable, the beams, weights, pans, pliers, all fitting together, as shown, so as to be slipped in a small box and put in the pocket. It affords a portable, convenient, self-calculator, and exceedingly delicate weigher of minute buttons, and such assays may be made with very great accuracy. But it may also be used for furnace assay buttons, either by its self-calculation or the scale, or for those who may prefer it, by attaching the pan and weighing by any decimated weights in the pan itself, which may still be read under the self-caculating mode or by any more ordinary manner.

Being entirely portable, delicate and efficient, this apparatus is of great use to prospectors as it does away with the necessity of expensive balances which occupy considerable room and require care and skill in management. This apparatus contains all that is required for such simple assays as prospectors need to make, and obviates the necessity of any calculations being made, the weights, as described, being self-calculating. It is specially devised for blow pipists.

The illustration is full size, and the price of the whole apparatus is $25.



PHILLIPS' SELF-CALCULATING SAMPLE AND BUTTON WEIGHER, FOR PROSPECTORS.

PACIFIC COAST CONE-BEARERS. — We begin this week the publication of a series of articles on the cone-bearers of California, written for the PRESS by Prof. J. G. Lemmon, of Sierra Valley. Prof. Lemmon is well known to our readers as a botanist of high standing, and as a writer whose love of nature, brilliant imagination and warm heart lie near his pen point and give a glow to all his composition. The series which we now have in hand will be found of a more popular character than the essays on the subject, by Prof. Asa Gray, which we published last summer. They will, however, be no less accurate as scientific reviews of the subjects advanced. Prof. Lemmon has lived for years among the trees which he presents to his readers, and has studied them as familiar faces. To be sure of his accuracy on scientific points, the series has been examined by Dr. Engelmann, of St. Louis, who leads the van in this branch of botany. We trust that all our readers who are interested in trees (and who is not?) will study this series of articles carefully and acquire an accurate knowledge of this division of local botany, which will be always of educational and practical advantage to them. Prof. Lemmon does public service by his writings of this kind, and we trust his reward for his honest work will come in due time, from the pockets, as well as the hearts of the people.

THE London and San Francisco Bank has received a telegram from its London correspondent, announcing that Lawrence O. Hall, the absconding clerk who got away with about $40,000 of the bank's money, was arrested on the steamer *Oceanic*, but whether at Yokohama or Hongkong the dispatch does not state.

THE United States sailing ship *Constitution* went ashore the other day on the English coast.

Copper Metallurgy.

Mr. Tulio Ospina, a student of the College of Mining of the University of California, proposes a modification in the precipitation of copper, by means of iron, in its extraction by the wet process, to be applied when the precipitating iron is in the shape of filings or *iron sponge*, for the purpose of avoiding the mixing of the fine iron with the copper precipitates.

The process consists in packing the iron into bags before putting it into the copper solution. It is based on the principle that the precipitation is effected in an electrolitbic way—a fact that Mr. Ospina has proved conclusively by the following experiments:

He packed some iron in a linen bag, with a piece of copper wire, in such a way that only a part of the latter would project outside of the bag. This having been placed in a solution of sulphate of copper, a thick layer of copper was deposited on the copper wire.

A similar arrangement, but in which the copper wire was isolated from the iron by a piece of glass tubing, remained in the solution till all the copper was precipitated on the linen, while there was none on the wire.

The precipitation, when effected in the proposed way, takes of course longer time than if it were effected by uncovered iron; but not so much longer as it would seem at first sight, on account of the precipitation being electrolithic.

Experiments made with bags of different kinds of materials gave the following results, as to the amount of copper precipitated inside of the bag, and the relative time of the precipitation:

Number of Threads per Centimeter of the Staff.	Percent of Copper Precipitate inside of the Bag.	Length of Time Required for the Precipitation.
12	3.1	5h 45'
18	2.6	6h 50'
31	2.3	8h 2'

The precipitation has to be made at a high temperature, and from a solution not exceeding 12° B, in order to obtain a loose precipitate, that can be easily detached from the bag. To make this, a canvas made of well-twisted threads is to be preferred.

The applicability of this process, as that of all the metallurgical processes, depends on local circumstances; but so far, we do not see why it could not be used in the localities where only *iron sponge* is to be had as a precipitating agent for copper, with the advantage of saving, by the use of some more time and fuel, the expense and trouble of refining the copper when it is mixed with a large amount of iron.

OUR series of articles on the quicksilver mines of old Almaden are concluded with a showing of the total product from 1564 to 1875, amounting to 120,000,000 tons in weight. *Apropos*, is the present value of quicksilver, for a graphic representation of which we are indebted to a fluctuation profile prepared by Mr. J. B. Randol, covering the period from 1850 to 1877. The price was lower in 1877 than ever before, during the period mentioned, except in 1861 and 1862, averaging between 40 and 50 cents per pound.

Academy of Sciences.

The regular meeting of the Academy of Sciences was held on Monday evening last. Dr. Blake read a paper on "The Rainfall in Different Parts of the State." It was shown that nearly all points on the coast receive more rain than San Francisco. The largest fall last year was at Truckee, viz., 87½ inches.

Dr. Kellogg read a description of a Japanese plant, purporting to be a superior substitute for asparagus, cooked and eaten in the same way. The seeds of this plant had been brought from Japan, but it had been cultivated here by Dr. Kellogg and Mr. Harford, successfully, and the specimen of the plant exhibited was that raised here.

A paper upon the "Genesis of Cinnabar Deposits" was read by S. B. Christy. The purpose of the paper was to determine whether cinnabar deposits were formed, as is usually supposed, by volatilization or from solutions. In the first place, the most noted cinnabar mines were briefly considered, and that of New Almaden was minutely described. Second, a brief statement of the chemical properties of cinnabar, as at present known, was given, showing that the present state of knowledge was insufficient to explain the formation of cinnabar in the wet way. Third, the results of some original experiments made by the author at the University of California were described. These experiments were undertaken at temperatures of from 150° to 250° Centigrade, and at pressures of steam of from 200 to 500 pounds per square inch. The results showed that cinnabar was soluble in the alkaline sulphides under these circumstances. The author succeeded in producing artificial cinnabar similar to that which occurs in nature. Also from the New Almaden Vichy water by adding sulphydric acid, in a similar manner, cinnabar was produced. Fourth and lastly, the author discussed the relative probabilities of the rival theories, and showed by a preponderance of evidence that the deposits of cinnabar, as they exist at present *in situ*, are undoubtedly the result of deposit from solution in solutions of the alkaline carbonates.

Prof. Davidson expected to have read a paper "On Instruments of Precision," but illness prevented his attending the meeting. The paper will probably be read at the meeting on the first Monday in February.

Tricks that are Vain.

We have been favored with another example—from Mr. J. S. Phillips, M. E.—where a peculiar method of salting had evidently been used. It consisted in dissolving an ordinary amalgam of silver and mercury in sulphuric acid, dipping porous sand-stones in the solution, and then disguising the excess of acid by ammonia.

The suspicious character of the stones and the peculiarly precious story of a mile square of such high ($500) average rock, induced the intended victim to seek chemical aid, which exposed unnatural quantities of sulphur, quicksilver, and even ammonia.

Subsequent examination of the so-called valuable property led to its condemnation, as none of these substances were found on the extensive scale described, in otherwise similar natural formations.

AN organized raid has been made by the Los Angeles police on the Chinese opium dens, and for the first time a law is found to fit their case. These places will now probably be entirely broken up.

SECRETARY SHERMAN, on Saturday, called for redemption $20,000,000 of 5.20 bonds of 1865, consols of 1867.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

About the Snake River Gold Mines.

How to Save the Gold.

Editors Press:—In reference to the Snake river country I will give you what I know to be facts, partly from personal observation and from information gathered from reliable parties who have but recently returned, among them Prof. J. E. Clayton. You say that many people at the Bay think the Snake river reports a humbug, and got up in the interests of traders, etc. This is quite an erroneous opinion. I have had men in my employ for years who were prospecting that stream in 1870, following it up from Taylor's bridge for 400 miles; they reported then finding gold all the way up, but so fine that they could not make wages with pan and rocker, but used amalgamated copper plates, then making high wages. They did not prospect then for *lodes* or *veins* bearing gold, but followed up the stream for coarser placer gold, that could be saved in the sluices. They were not prepared at that time, to try the plates as thoroughly as they are used now, but used quicksilver in riffle boxes. They reported finding hars where they could make four and five dollars a day to the hand on the average, and sometimes $30, $40 and $50 per day, but were much harassed and troubled by Indians attempting to steal their stock.

The whole valley and river bottom is frequented by the Snakes, Shoshones, and other tribes, for fishing purposes. The stream affords any amount of sturgeon, salmon, and various kinds of fish. The sturgeon are very large, some of them weighing 150 pounds. Though supposed to be friendly, the Indians of this region have always shown a disposition to annoy small parties.

The river bottom is not a continuous valley. In many places it runs through barren sage brush plains; in other portions through beautiful fertile valleys. But little timber is found, except cottonwoods upon the immediate banks of the river, until it turns north towards the Columbia, and above the first canyon. This is situated 30 miles or more above Taylor's bridge, and is 25 miles long.

Most of the mining was done in '70 and '71, below the bridge. The bedrock there, is a lava rock; and the gold on the bars is in sand with fine shells, but very little clay is found. Above the canyon there are extensive gravel beds 50 feet high, showing cement gravel where the river has changed its bed, good gravel claims will no doubt be found. Above this the stream forks into the north, middle and east forks. On some of these good hydraulic claims were opened several years ago, and it is said coarser gold was found on some of the branches.

That it is a gold country for 400 miles along Snake river, does not admit of a doubt. If there are any traders to be benefited by reports, they have established themselves lately, and since we passed through the country in '71. It is a good stock range and a great game country, ducks, geese, deer, antelope and hare are plentiful along the whole stream. That portion of it now being prospected, runs through several detached spurs of the Rocky and Blue mountain ranges. These canyons are steep, rocky and hard to penetrate with animals. Here of course, there is plenty of fall, but very little chance to get at the river bed. Outside of these gorges where the river spreads out and forms bars, there is but little fall and water. To get any considerable head, water will have to be brought long distances—if indeed that is practicable, on account of the sandy nature of the soil. Doubtless gold will be found in the vicinity of small branches and the canyons above referred to, where water may be obtained without pumping it from the river.

The Present Method of Saving the Gold

Is simply adapting the mill process of saving the gold outside of the batteries; and parties succeed who copy this process as nearly as possible, provided always that there is plenty of gold to save.

I read with much pleasure the opinions of Messrs. Attwood and Paul, on gold amalgamation, rusty gold, etc. They are both gentlemen of long practical experience, and their ideas tally with the settled convictions of a large majority of old miners and millmen. Ask them to explain through your columns, why it is that gold scraped from a retort will not readily amalgamate. Such is the fact; sometimes a little adheres to the bottom when the retort has been overheated; on chipping this off it is difficult to make the gold amalgamate with clean quicksilver. I often thought of trying to ascertain the cause, but never attempted to do so; and it is now several years since I have had the opportunity. Mining in this section is confined to silver and galena ores.

In conclusion, without going minutely into the details of gold amalgamation, I will say in general terms, the slower the gold can be made to pass over the plates, the more will adhere to them. It is scarcely necessary to say the more perfectly the gold is freed from clay, sand and all other sticky gangue matter, before it reaches the plates, the better; for the reason that if much remains you must either use a large head of water, or set the plates steep; either of which is against close amalgamation. In placer mining the gold is nearly always mixed with more or less clay. It is absolutely necessary to free the gold from this before its reaches the plates. To do this it often requires a large and swift head of water in the sluices. The sluices should be sufficiently long to have the clay forked back until completely torn to pieces, and dissolved, so that nothing but riley water passes over the plates. Before the rush of water reaches them, make a quicksilver trap; a box six or eight inches deep between the last sluice and the plates. In the center of this, crosswise of the sluice, a gate. Put an inch of quicksilver in the box and push the gate down close to it, so that everything goes down on the upper side of the gate, into the silver, and up on the lower side into the amalgamated plates—having taken a quicksilver bath. Below the trap a table should be used much wider than the sluices, and the water spread over it by stops and cleats, with just force enough to clean them of sand. Keep the amalgam as soft as it may be without breaking and running off the plate. Use rubber belting to scrape your plates, and do not scrape to clean at first; have plenty of amalgam on them, you will not lose by it. Truly yours,

"'49ER."

Park City, Summit Co., Utah, Jan. 1st, 1879.

Undercurrent Wheels for Hoisting and Washing Gravel.

Editors Press:—Much has been said and written in the Press about dip wheels and their uses. Such a wheel has been erected this summer on Poverty Bar, on the middle fork of the American river, Placer county, California, by five workingmen, no other capital except their labor and brains, combined with indomitable will; they deserve much credit for their energy and perseverance. The wheel is doing excellent service, and they are being amply rewarded for their labors by working a fine claim, which is paying well.

The size of the dip wheel is 48 feet diameter and 8 feet breast. The buckets are 15 inches wide on each side of the wheel. It lifts 125 inches of water 48 feet, and discharges it into a ditch 500 feet long. This water is the power for hoisting the dirt with a derrick and pumps the water over 25 inches. The pit is 40 feet deep.

The latter wheel is 29 feet diameter, 4 feet breast. They raise about 30 cars per hour; each car weighs 1,400 pounds. This water is also used to wash the dirt, and there is plenty of water for all purposes.

Now will any of your readers tell us how much water (miners' inches) it requires to run the big wheel, and lift from 125 to 175 inches of water 48 feet?

By giving this a place in your valuable paper you will much oblige a constant reader.

John Hemsley.

Cosmic Meteorology.—No. 1.

[Written for the Press by Samuel Purnell.]

Some of the readers of the Press may remember that about a year ago a series of articles was published over my signature on "Trees and Rainfall," in which it was attempted to be shown how summer rains can be produced in California. The lapse of a year has further convinced me as to the soundness of the views therein expressed, to the effect that a considerable rainfall could be induced during the hot months of summer by the maintenance of trees. In one of the articles some reference was made to the recently-arisen question of the relation of

Sun-spots and Rainfall,

And the extreme probability of the amount of rainfall upon the Pacific coast of the United States being dominated by the 11 years sun-spot period; also that, as the year 1877 was one of a minimum sun-spot group, I considered it probable that the ensuing winter would be what is locally known as "dry;" that is, a winter when the average rainfall throughout California is not sufficient to secure fair crops throughout the State. Inasmuch as nearly twice the annual average of rain actually fell, the failure of the prophecy hazarded, was so complete as to be almost ridiculous. The grounds of this supposition were, in brief, as follows: That as all terrestrial motion depends upon the sun, more or less activity of the sun will cause more or less activity in the motive powers at work upon the earth; that after many years of observation it has been ascertained that the activity and dynamic qualities of the sun vary from year to year, and in a cycle averaging eleven and one-ninth years; and that this variation is coincident with, and more or less dependent upon, the increase and diminution of the sun-spots; that when the surface of the sun is thickly covered with spots, its potency is enormously magnified, and the solar forces which govern all terrestrial phenomena are correspondingly exalted; that during the period of minimum sun-spots the activity of the sun is greatly lessened, as shown by the insignificance of the chromo-sphere, the prominences, and the corona; that while the whole scope of the power and influence of sun-spots, or of that solar condition of which they are indicative, is not much understood, yet enough is known to strongly affirm that the potency of the leading terrestrial physical phenomena advances and recedes as does the quantity of the sun-spots; and that a cycle of magnetic declination, of *aurorœ polares*, of cyclones, of temperature, and of rainfall exists coincidently with, if not completely governed by, the sun-spot cycle; and that while the winter rainfall of California did not, as yet, exhibit exact accordance relatively with the sun-spot curve, it appears to be chiefly influenced by the varying solar state, the maximum and minimum of rainfall generally occurring in the maximum and minimum sun-spot year-groups respectively; and that there can be little doubt of the truth of the broad assertion that, taking the entire surface of the earth, the totality of the rainfall is strictly variable relatively with the solar spots.

But the time for prophecy has not yet come; knowing the law of the totality of rainfall, its local distribution is but feebly understood, and cannot be predicted. Why, in 1877–8, a year of the minimum sun-spot group, California should have received a maximum rainfall, I do not know, have no means of knowing, nor do I know of any one who will venture a theory upon the cause. Evidently, there is much yet to be ascertained before the rainfall of any particular place can be confidently and scientifically predicted far in advance; but very much, indeed, has been accomplished when one is able to say that the totality of rainfall agrees with the variation of a well-known heavenly phenomenon; and

The Day will Come

When cosmic and terrestrial meteorology will each be so thoroughly understood that the local rainfall of California, or of any other State, can be accurately predicted many years in advance. When this, now intricate and insoluble problem is mastered, the coming man will have learned how to produce rain.

Although the rainfall for 1877–8, upon the Pacific coast of America, was so largely in excess of the indications, yet the influence of the minimum sun was remarkable in many other parts of the world, and the moisture that should have fallen upon their drouthy lands, was instead poured upon this coast. From Alaska to the equator the Pacific coast received, with some exceptions, from one and a half to three times its mean annual rainfall, and most of the entire continent of North America and western Europe is reported to have received more rain than upon the average. In contradistinction to this,

Australia,

In the summer of 1877–8, suffered a severe drouth; the famine of India still continued; northern, China experienced a drouth and resultant famine that cost millions of lives; the Sandwich islands and other Pacific islands suffered from an unprecedented drouth; Brazil encountered her most disastrous drouth of the century; in the northern States of Mexico a drouth and famine prevailed to such an extent that provisions had to be imported; in New Guinea the natives suffered frightfully from a drouth; a drouth that caused the failure of crops prevailed on the western coast of South America; Persia and the central plateaus of Asia were also devastated by drouth; and, no doubt, when the returns shall all be made up, it will be seen that upon the whole, the rainfall of the last season was largely below the mean. Thus it will be seen that there were weighty reasons for the belief that California would, last season, meet with a "dry winter;" and why it did not, will in the future appear from the law of variation, to be discovered.

It will be interesting to examine briefly the

Literature of Sun-Spots

And their correlative manifestations; to look into their cause, nature and character, their periodicity, the like and almost equal periodicity of magnetic variation, of cyclones, of aurora polaris, of hurricanes and marine losses, of epidemics, of disease, and of drouths and rainfall.

The literature of sun-spots commences with the dawn of history. In very ancient times black spots upon the face of the sun were, of course, observed when large enough to be seen by the unassisted eye (?) They are supposed to be mentioned in the first Georgic of Virgil. The Chinese recorded the appearance of sun-spots A. D. 321; and Acosta says the natives of Peru told the Spanish invaders that the sun's face had, in former times, been marked with spots. In the year A. D. 807, a large spot was seen on the sun for eight successive days. In 1611 the first scientific observations upon the spots were made by Fabricius; and soon after Galileo began to study them, pursuing the subject with such diligence that he lost his eyesight. But no systematic observations were made till Hofrath Schwabe took up the subject in 1826, who, after about 12 years' labor, first recognized their periodicity. It is almost needless to say that no one believed his report. He then labored on for 20 years more, till he had completed the observation of three complete oscillations from maximum to minimum and back again, during which time he made about 9,000 observations and discovered 4,700 groups of spots. It was principally from a study of Schwabe's observations that Prof. Rudolf Wolf, of Zurich, deduced the periods of oscillation as 11.11 years. Schwabe's observations were improved upon by Mr. Carrington, of England, and by Dr. De la Rue and Prof. Balfour Stewart. Dr. Wolf has published a list of the mean relative number of sun-spots for each year from 1750 to 1877. Although somewhat inaccurate for those years prior to 1820, when Schwabe began his exact observations, this list exhibits 11 cycles of sun-spots, giving an average of 11 1-9 years to each cycle.

These Cycles

Of solar activity have been proved to be coincident and correlative with several well marked cycles in the atmospheric and other conditions of the earth, attention having been chiefly given to the correspondence in four particulars: 1st, periodical variations in terrestrial magnetism and electrical activity; 2d, periodical variations in temperature; 3d, the periodicity of wind disturbances, hurricanes and cyclones; 4th, the periodicity of the total rainfall.

In the condensation of the facts of the several discoveries and publications upon these subjects, as given below, I am chiefly indebted to the admirable resume of the whole subject by Messrs. J. N. Lockyer and Dr. W. W. Hunter, in a late issue of the *Nineteenth Century*.

1. With regard to the

Sympathetic Periodicity

Of terrestrial magnetism and electrical activity. The magnetic needle, though seemingly still, is yet always in motion. Certain of these motions depend on the hour of the day; others on the rotation of the sun, moon, etc., but the magnet is liable to irregular and abrupt fluctuations which cannot be connected with the daily oscillations. Sir Edward Sabine found that such fluctuations are most frequent in years of high sun-spot activity, which relatively had been suggested as far back as 1785. Gauss made further discoveries between 1834 and 1837. Arago's observations from 1820 to 1830, published in 1854, further established the relation. In 1851, Dr. Lamont published his long-continued researches, indicating the existence of a cycle of magnetic variations, occupying, as he believed, on an average 10½ years. Sabine in 1852 carried on the work still further, and be observed that the irregular fluctuations of the magnet were almost invariably accompanied by displays of the *aurora polaris*, and concluded that auroral displays occurred most frequently in years of maximum sun-spots, a conclusion which has since been completely verified. Dr. Wolf and M. Gautier had independently remarked in 1852 the coincidence of the decennial magnetic period with Schwabe's period of sun-spots. In 1865, Prof. Loomis, of Yale college, supplied further evidence on the range of the magnetic declination and auroras in their relations to sun-spots. He concluded that the auroras observed in Europe and America exhibited a true periodicity, closely following the magnetic periods. Signor Schiaparelli, in 1875, made important contributions to this subject, as did also Sophus Tromholdt in 1875, and Dr. J. A. Brown in 1876. The latter gave the mean duration of the magnetic cycle at 10.45 years, and he supplied a valuable chart showing the decennial period of the diurnal range of the magnetic declination and the sun-spot area from 1784 to 1876. The curves show the general coincidence of the magnetic and sun-spot cycles in a clear light. In 1877, Prof. Balfour Stewart reviewed the whole question, and exhibited the sun-spots, magnetic declination, and auroras from 1776 to 1872 in curves which follow each other with indisputable coincidence. He further examined the connections of these three coincident cycles with the planetary configurations, the result of which will be stated further on. It has been observed in England that earth-currents disturbing magnetometers, and telegraphic instruments are in close relationship with auroras and sun-spots; and that magnetic storms occur most severely during periods of maximum sun-spots. "To sum up," says Lockyer and Hunter, "magnetic observers now hold that not only do the spasmodic fluctuations of the needle follow closely, curves coincident with the sun-spots, but its diurnal oscillations are not less dependent on the state of the sun's surface."

2. With regard to solar radiation and

Thermometric Variations

Many difficulties complicate this line of research, and the evidence is less complete than that which connects the other phenomena mentioned with the sun-spots. The reasons for this will be plain upon a little reflection. The temperature range that must first be had, is that of the universal mean, and this, of course, cannot be obtained till there is a universality of thermometric observations and records. The mean temperature of one locality, or even the average mean of a hundred localities, it is plain can serve, but as a coarse approximation, to the mean total temperature. Unlike the instantaneous and universal operation of terrestrial magnetism and atmospheric electricity, which can be nearly as well observed in one place as another, and almost as completely in one place as in a hundred, heat is, as far as can now be said, altogether local in its appearance, power and duration, and, as is well known, the mean temperature of every locality is an individual quantity, varying from that of its neighbors.

The atmosphere is the scene where the solar energies are incessantly in operation; and when most active, are most screened from the surface. There is evidence to show that the vapor of water, like the vapors of metals, exists in various molecular conditions, some of which are transparent and some are opaque to those rays which affect our thermometers; and, according to Mr. Lockyer, there is evidence to suggest that the aqueous vapor produced at the period of minimum sun-spots would be more transparent to the heat rays than that produced at other times. The thermometric inquiry divides itself into several distinct branches, such as the direct solar radiations, the calorific intensity of the sun's light, the daily temperature range, and the mean annual temperature, all of which must be passed by with slight notice, as this paper is more particularly devoted to the question of the relation of sun-spots and rainfall.

MECHANICAL PROGRESS.

Dry Plumbago vs. Oil in Steam Cylinders.

A correspondent of the *American Machinist*, has been experimenting with the ors of dry plumbago as a substitute for tallow and oils for steam cylinders. The correspondent, who is an engineer of some years' standing, writes as follows: The engine upon which the experiment was tried was an 11x30 horizontal engine; piston speed, 300 feet per minute, and was known as the "West Poppet-Valve, Automatic Engine." It was worked up to its full capacity, and, to insure a fair trial, the existing oil-cup was exchanged for a goblet-shaped tallow-cup with a lid, after which the piston-follower and springs were taken out and cleaned. When ready to start the engine, one-third of an ounce of finely powdered Ceylon plumbago was placed in the cup. As soon as the engine was fairly under way, the valve of the grease-cup was opened half way. After running some time it was opened all the way. When the engine was stopped at noon, the plumbago had all passed into the cylinder, of which there had been strong evidence, soon after starting, as the piston-rod became coated with it. Upon starting up in the afternoon, one-third of an ounce more was placed in the cup, and the engine run until six o'clock, with a similar result. There was no noise in the cylinder, either in the starting, running, or stopping of the engine; and after 18 months' use, with the above-named quantity applied twice a day, no noise has been heard in the cylinder, except when the steam was shut off for the purpose of stopping the engine, when it would be heard during one or two strokes of the piston, just before the engine stopped. This occurred not oftener than would have taken place if tallow or oil had been used. Soon after beginning its use, a portion of the plumbago would be found remaining in the cup; to obviate this, about an ounce of water was poured into the cup, after the plumbago had been put in, when a decided improvement was observed, so much so, that it can now be fed into the cylinder as readily as oil or tallow. After four weeks' use, the cylinder-head was taken off and the working part of the cylinder was found coated with plumbago which could not be easily rubbed off with the fingers; the interior of the piston was found as clean as when it left the lathe, so far as dirt of any kind was concerned, and such is the condition to this day.

GAS ENGINES.—A successful gas engine is something that is greatly needed for many purposes, especially when but small power is required, and particularly on crowded business streets in cities, where the presence of steam boilers are not desirable. Just at this time the Otto gas engine seems to be attracting much attention. At a recent meeting of the Franklin Institute, in Philadelphia, the chief attraction of the evening was the new "Otto silent gas engine," which was placed upon the stage, and, after an explanation of its various parts, as shown upon a screen by the aid of stereopticon, was set to work. It was claimed that for persons requiring a moderate use of power, this motor is the best that could be devised. It is at all times ready for use, either continuously or intermittently; can be started and stopped readily; burns not more than four and a half cents' worth of gas per hour per horse power; is entirely free from the danger of explosion, as no steam is used; there are no coals, ashes, dirt or smoke; costs nothing when idle, and but little when running, and is almost noiseless. The charge of gas (or petroleum) and compressed air burns readily, and the combustion is automatically regulated with very little shock to any of the parts, in proportion to the power developed.

HEAVY RAILS PREFERABLE.—English engineers are fast coming to the conclusion that heavy steel rails are economical. They entertained this belief long ago, and it was based upon scientific reasons. Now that steel is so very cheap, their scientific views are more than confirmed. The Phœnix Bessemer Steel Company are now making exceptionally heavy rails for the Midland Railway Company, the weight being 85 pounds to the yard. A heavy rail like this ensures a smooth run, and adds to the safety of the train. Rails now in course of delivery by the Dronfield Steel Works to the Great India Peninsular railway are 80 pounds to the yard.

IRON AND STEEL.—In the course of his address to the Society of Arts, recently, Lord A. Churchill called attention to the enormous development of the steel manufacture during the last two or three decades. So rapidly, he said, was it taking the place of iron, that an eminent engineer has said the days of iron are numbered, and that 50 years hence it would be unknown.

THE steel product of the whole world 20 years ago amounted to little more than 300,000 tons, at an average cost of about $150 a ton. Last year the production went beyond 2,200,000 tons, and its cost only showed an average of $60 a ton, a falling off in cost of production of 60%.

A NEW COMBINATION RAIL.—The latest device for a rail consists of two outer steel plates, two inner iron plates, with a lead plate between them, and strips of paper between the iron and steel plates, the whole united by bolts.

Making Lumber from Straw.

A person named S. H. Hamilton, of Bushnell, Illinois, has been in this city for two or three days past, with samples of lumber, which has attracted much attention among the lumbermen and which, if it possesses all the virtues that are claimed for it, is one of the most important inventions of its kind ever brought to notice. If it is a success it will form a new era in the art of building. To make hard wood lumber out of common wheat straw, with all effects of polish and finish which is obtainble on the hardest of black walnut and mahogany, at as little cost as clear pine lumber can be manufactured for, is certainly wonderful. Such are the claims of Mr. Hamilton for the straw board lumber which he has been exhibiting in this city, and the samples which he produces would go far toward verifying his claims. The process of manufacture, as explained by Mr. Hamilton, is as follows: Ordinary straw board, such as is manufactured at any paper mill, is used for this purpose. As many sheets are taken as are required to make the thickness of lumber desired. These sheets are passed through a chemical solution, which thoroughly softens up the fiber and completely saturates it. The whole is then passed through a succession of rollers, dried and hardened during the passage, as well as polished, and comes out of the other end of the machine hard, dry lumber, ready for use. Mr. Hamilton claims that the chemical properties hardening in the fiber entirely prevent water soaking, and render the lumber combustible only in a very hot fire. The hardened finish on the outside also makes it impervious to water. The samples which Mr. Hamilton exhibits could hardly be told from hard wood lumber, and in sawing it the difference could not be detected. It is susceptible of a very high polish, and samples of imitation of marble, mahogany, etc., were shown, which might deceive the most experienced eye. Not only does Mr. Hamilton claim a substitute for lumber in sash, doors and blinds and finishing stuff, but also as a substitute for black walnut and other woods in the manufacture of all kinds of fine furniture, coffins, etc., and also an excellent substitute for marble in marble-top tables, mantle pieces, bureaus, etc. He claims that it will not warp in the least. Mr. Hamilton is negotiating with parties here, with a view of establishing a manufactory in this city for making the various articles of building material for which his lumber is suitable.—*Oshkosh, Wis., Northwestern.*

FLINT BRICKS.—Under the title of "Improvements in furnaces and other building blocks, retorts, crucibles, and other fire-resisting articles" a patent has recently been taken by Mr. D. Selwey, of Bridgend, Glamorganshire, for bricks composed of pure flint, without the admixture of alumina or any other substance to detract from the high refractory character of the material. The inventor treats the flints in such a manner as to produce from them, when in a pulverized condition, bricks or blocks of great structural strength and durability, superior in fire-resisting properties, it is said, to the best descriptions of fire-clay goods. His patent also extends to the manufacture of artificial stone for building purposes. The material when burned resembles a fine-grained freestone, and is sufficiently hard to resist the action of the weather. It is in furnace work and similar applications, however, that these bricks are expected to be most successful.

A NEW ROTARY ENGINE.—Mr. Babbitt, the well-known soap manufacturer, of New York, has invented a rotary steam engine, which is said to develop extraordinary power, with a very small steam supply. A correspondent of the *American Machinist* reports having seen one, four inches in diameter, running 20,000 revolutions a minute, with steam supplied by an one-eighth-inch pipe, which defied the efforts of the heaviest men to stop it by throwing their weight upon a good lever.

MALLEABLE BRASS.—A German periodical is responsible for the following method of making malleable brass: Thirty-three parts of copper and twenty-five of zinc are alloyed, the copper being first put into the crucible, which is loosely covered. As soon as the copper is melted, zinc purified by sulphur is added. The alloy is then cast into molding sand in the shape of bars, which, when still hot, will be found to be malleable and capable of being brought into any shape without showing cracks.

AN IMMENSE LOCOMOTIVE.—An immense locomotive has recently been built at Philadelphia for the Mexican and Southern Pacific railroad. The engine weighs within a fraction of 60 tons, has 8 driving wheels, and a pony (two-wheel) truck. The weight is so great that the Western railroads, over which it must pass, will not permit it to go over bridges, so it will be taken to pieces and carried over in sections. It passed over all the bridges of the Pennsylvania road without being dismantled.

EDISON'S MECHANICAL DEVICE.—One of the most interesting and useful of the mechanical devices which Mr. Edison employs in his electric light apparatus is his plan to prevent the wire fusing, and this it is claimed, has been accomplished by so applying a small bar that it will expand the instant the wire reaches the fusing point and intercept the flow of the current through the wire sufficiently to prevent fusion.

SCIENTIFIC PROGRESS.

Bioplasm.

Among the recent discoveries in science, none perhaps will prove of more utility to man than those relating to bioplasm, because they throw light on physiological questions, particularly those concerning the construction and nutrition of the body and the causes of disease. It was formerly supposed that our bodies were alive from top to toe, inside and out; but this is found to be a mistake. Only about one-fifth part is alive; the rest is formed material. Everybody knows that a tree may become so hollow that only a shell is left; yet the tree may grow and mature buds and leaves and fruit. It is because the outside of the tree—the bark—is alive; the wood is non-living; it is simply formed material. Now the body is not like the tree—alive only on the outside; but the living portion and the formed material exist together in every part—in every tissue, organ and vessel.

A slight abrasion of the cuticle, or the rupture of a cell, is followed by particles of fluid which were formerly overlooked as of no account. But the microscope has revealed to us that this apparently useless, insignificant ooze is the vital, living part of the body; it is *bioplasm*.

This is the mechanic, the skilled artist, that constructs the cells, builds the organs, and perhaps, under the direction of a higher power, adapts each part to one harmonious whole.

For the last 15 years, certain English and German physiologists have spent much time with the microscope, watching this little workman. They have seen it forming tissue, muscle and nerve, changing food into blood, making the secretions; and, as parts of the body became worn and effete, silently disintegrating and utilizing them, or removing the useless parts from the body.

The first decided knowledge of bioplasm came by accident (if finding a thing we are searching for can be called accident; is it not rather revelation?), by ascertaining that when a piece of live tissue is immersed in a solution of carmine the bioplasm is stained, and the formed material is not stained. This discovery has enabled observers to find and watch this little workman, while busy in constructing every part of the body.

Bioplasm is the builder not only of the body, but of all animals and plants. To it every organized form, whether animal or vegetable, owes its formation and growth.

Bioplasm is a clear, colorless fluid, like thin mucus. Only microscopes of the highest power are of use in studying the substance; for the largest normal masses are not one-thousandth of an inch in diameter; but such microscopes fail to detect in it the least sign of organization. Yet this apparently unorganized substance is the cause of all organization. It is a medium through which dead inorganic matter becomes living, organized.—*Journal of Chemistry.*

POSSIBLE EFFECT OF THE MOON IN EARLY GEOLOGIC TIME.—In a note to *Nature*, Mr. W. Davies writes: "In considering the climatic changes which have evidently taken place on various parts of the earth's surface, it seems to me that what may have been a very important factor has been rather strangely left out of calculation by physicists, never having been noticed hitherto, as far as I am aware. It is that of the heat which must at one period or the other have been transmitted from the moon. There can be scarcely a doubt that this must at one time have influenced the earth's climate to a very powerful degree, producing the effect of a second or additional sun. In the absence of any perceptible marks of atmospheric or aqueous erosive action on the moon, it is at present impossible to arrive at an idea of its relative age, or at what period its heat may have been most abundantly radiated; but if the much hotter climate which once prevailed in northern latitudes could be referred to this cause, it might give us some clue to the difficulty. Something also might be done in comparing the various changes of climate which have taken place in certain parts of the earth's surface, as indicated by geological evidence, with the actual course of the moon. The subject is at least worth entertaining, and may be recommended to the consideration of physicists."

SAFE AND CONVENIENT METHOD OF TESTING DYNAMITE.—The *Chemiker Zeitung* contains a description of a method of testing dynamite. The percentage of nitro-glycerine is determined by extracting it with ether, which dissolves it, but leaves the infusorial earth unchanged. The difference in weight of the dynamite and of the infusorial residue, directly yields the percentage of nitro-glycerine. In order to ascertain whether the dynamite contains any other bodies soluble in ether, the ether extract is diluted with water, which precipitates any foreign substances present.

A NEW BLASTING AGENT.—In Stockholm the following recipe has been given for a new blasting agent: In wooden or gutta-percha vessels 5 to 20 parts sugar or molasses are ground with 25 to 30 parts nitric acid, and 50 to 75 parts sulphuric acid. Of this mixture 25 to 50 parts are mixed with 15 to 35 parts nitrate of potassium and 15 to 35 parts cellulose. The agent is called nitrolin.

Occlusion of Hydrogen by the Metals.

In his notes of interesting things seen at the Paris exposition, Professor B. Silliman writes to the *Engineering and Mining Journal* of the occlusion of hydrogen by palladium: "The late Dr. Graham, of London, the distinguished chemist and Master of the Mint, first described what he called *occlusion* of hydrogen in the pores of the most solid fused and coined palladium, a property in virtue of which palladium can imbibe, so to speak, more than a thousand times its own volume of hydrogen gas and hold it with great permanence at ordinary temperatures. This is not a fact of merely curious scientific interest; nor is it peculiar exclusively to palladium; for Dr. Graham found that some meteoric irons, especially that of Lenarto, which he specially studied, held also many occluded volumes of hydrogen gas which had accompanied the meteor from the realms of space. Considering the enormous condensation of hydrogen occluded in palladium, Dr. Graham was led to the not improbable suggestion that this element, which others before him had suggested might be a metal in vapor, must exist in palladium *as an alloy*, and he was thus led to propose for the metal the name "Hydrogenium." This class of facts had quite recently received great expansion by the researches of Dr. Wright, of Yale, who has followed the subject into the domain of astronomy, and drawn important inference respecting the tails of comets and nebulæ as connected with the occlusion, not only of hydrogen, but other gases in meteoric stones and irons.

Increased Weight and Volume of Metal by such Occlusion.

This curious subject, so full of scientific interest and fertile of speculation, has a magnificent illustration in the present exhibit of Messrs. Johnson, Mathey & Co., who show a disc of palladium within which one thousand volumes of hydrogen gas are condensed by occlusion, a volume of gas which would be represented by a column of 2,000 millimeters in hight and 100 millimeters in diameter. The original palladium disc had exactly 100 millimeters diameter, and a thickness of precisely two millimeters. It was, before imbibing the enormous volume of hydrogen which it now holds, perfectly flat; and it was gauged by a ring within which it exactly fell. Now the disc is a concave mirror, the new form being occasioned wholly by the molecular displacement due to the hydrogen it has absorbed; it no longer enters its gauge ring, for its 100 millimeters diameter are now enlarged to 102·5 millimeters, and its original weight of 187·3775 if now increased to 188·2882 grams. This remarkable absorption of hydrogen has no visible effect upon the luster, color, or tenacity of the palladium-alloy of hydrogen, if indeed it be an alloy. The hydrogen absorbed by palladium enters this metal, when it is made part of the circuit of a voltaic battery the gas usually evolved at the positive pole being then taken into the substance of the solid metal."

UNIFORM TIME FOR GERMANY.—The question of establishing one uniform time for the whole German empire is being just now much discussed in various circles in Germany. Many persons regard the existing condition of things as very inconvenient, especially in connection with telegraphic communication. Metz, in the extreme west, is about an hour and seven minutes later than the extreme eastern frontiers. Opinions are agreed that taking into account the geographical position of Berlin, which is not very far from the central meridian of the whole country, the metropolitan time will be the most suitable for selection as the normal time for the entire empire. This will involve the least departure from astronomical exactness which is compatible with general uniformity. The difference between Berlin and the eastern frontier is little more than thirty-seven minutes; between it and Metz is less than thirty minutes. It is understood that the matter has already engaged the attention of the several federal governments, and that it will be most carefully considered in all its bearings before a decision is arrived at.

"DENDRITIC" SPOTS ON BOOKS.—Few persons familiar with old books have failed to observe dark specks here and there upon, or rather within, the substance of the paper, which, upon close examination, especially with a lens, are seen to have the same dendritic appearance that we find in moss-agates, and upon the naturally-fractured surface of other compact rocks. It is well known that such markings on the stone, are generally produced by an oxide of manganese; and the similar markings upon the paper are doubtless due to the same cause. The following is suggested as an explanation: Binoxide of manganese is sometimes used in some of the processes of bleaching the pulp. Minute portions of the mineral would naturally remain in the manufactured paper, which by a slow reaction would be restored to an oxide again, in the process of which it would assume its characteristic dendritic form.

DELICATE REAGENT FOR COPPER.—Dilute solutions of copper salts, it is well-known, give a deep blue with ammonia. F. Weil, of Paris, announces a still more delicate test for copper, namely, to add to any copper solution double its volume of pure hydrochloric acid, which produces, especially on boiling, a yellowish-green color, even when the quantity is too small to be weighed.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 2.		Week Ending Jan. 9.		Week Ending Jan. 16.		Week Ending Jan. 24.	
Alpha	11	10¾	11⅞	10½	12⅞	11⅞	15	12½
Alta	5½	5	5⅝	5	8	6¾	8½	7¼
Andes	50c	....	65c	50c	....	....	60c	45c
Alps	....	....	....	....	....	....	....	....
Argenta	2.90	2.60	2.65	2.60	1.35	50c	60c	80c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	1.40	1½	2	1½	1½	1½
Belcher	3.80	3¾	4.30	3.80	4.90	4½	5½	4.40
Belmont	60c	10c	60c	....	60c	50c	60c	50c
Best & Belcher	18½	17	18¾	17⅞	24½	19½	22¾	21½
Bullion	5⅝	4.65	7	6⅝	8½	6½	9	7¾
Bechtel	70c	50c	60c	50c	60c	50c	1	75c
Belle Isle	20c	15c	70c	....	20c	....	20c	....
Bodie	8	7¾	9	7¾	9½	8½	9	7¾
Benton	3½	2¾	3½	3	4½	3.20	4.90	4½
Bulwer	15	14¾	15	10	15	14	15	14
Boyle	....	....	....	....	....	....	....	....
Black Hawk	....	....	30c	10c	60c	50c	75c	70c
Belvidere	75c	50c	60c	....	60c	....	70c	50c
Booker	60c	50c	50c	45c	40c	....	30c	25c
Caledonia	2.55	2¾	2.95	2.40	3.20	2¾	3.20	3
California	10½	9¾	11½	10⅝	11½	9⅝	9¾	9¼
Challenge	1.70	1.60	2	1½	2.95	2.40	3.05	2½
Chollar-Potosi	47½	38½	46	41½	52	44½	50½	47
Comanche	....	....	....	....	....	....	....	....
Confidence	9¼	9	10⅝	9	15	12½	17	14½
Con Imperial	80c	70c	85c	75c	95c	75c	1.15	95c
Con Virginia	8½	7¾	9⅞	8½	8¾	7½	8⅝	7⅝
Crown Point	3.65	3.45	3.90	3.60	5¾	3.95	6	5
Con Washoe	....	....	3.10	2.10	2.10	....	....	....
Champion	40c	30c	....	....	40c	10c	40c	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	....	10c	....	....	....	15c	5c
Daney	....	....	....	....	....	....	....	....
Day	30c	....	25c	....	25c	....	30c	20c
Eureka Con	32	31	32½	31	31¾	26¾	29	26
Exchequer	4.40	4	5½	4½	5⅝	4½	6⅝	5⅝
Endowment	35c	30c	....	....	35c	30c	30c	25c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	8½	7⅝	7½	5⅝	5½	4	6⅝	3.90
Gila	....	....	25c	15c	....	....	20c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	5⅞	....	5⅝	....	5	....	....	....
Goodshaw	40c	30c	40c	30c	35c	30c	35c	30c
Gould & Curry	9½	8⅝	11⅝	9½	16⅞	10⅞	14⅞	13¼
Hale & Norcross	12½	10⅝	14½	12¼	20	14½	16¼	16½
Hillside	2¼	2	2.10	2	2.10	....	....	....
Highbridge	2.40	2¼	2.45	2⅛	2.05	1¾	1.80	1.55
Homestake	....	....	....	....	....	....	....	....
Hussey	35c	....	30c	15c	15c	....	20c	....
Independence	1½	1.20	1.10	1.05	1.30	1.05	1½	1.40
Julia	6⅝	2¾	4.15	3½	3.90	3.40	4½	3.45
Justice	3¾	3½	4½	3.90	4¾	3.90	4½	4
Jackson	7½	7	9	7¾	7½	....	7½	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	3.90	3.70	4.85	3.95	5⅞	4¾	8	5½
Kossuth	20c	15c	50c	20c	20c	....	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	90c	50c	75c	50c	75c	55c	75c	60c
Lady Wash	80c	70c	1½	65c	1.30	1.20	1½	1
Leopard	1	....	50c	....	....	....	70c	30c
Leviathan	50c	35c	65c	50c	55c	50c	1	55c
Leeds	1½	1½	1	....	1.10	.1	1.10	1
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	....	....	....	....	....	....
Modoc	60c	....	60c	50c	50c	....	60c	50c
Manhattan	4½	4	4½	4	4½	3.35	3¾	3½
Martin White	5	....	4½	4	4	....	5½	5
McClinton	40c	....	40c	25c	40c	25c	50c	25c
Meadow Valley	20c	....	20c	....	20c	....	....	....
Mexican	31	28	33	30½	34	29¾	34¾	32½
Mides	....	....	....	....	....	....	1½	....
Morning Star	2½	....	....	....	3	2¾	3½	3
North Con Virginia	5¼	4½	6¾	5½	7¾	5¾	7½	5⅜
New York	65c	55c	90c	75c	75c	65c	75c	70c
Northern Belle	10	9¾	9¾	6½	8¾	7½	7	6
New Coso	....	....	....	....	20c	....	....	....
Navajo	45c	40c	45c	35c	45c	35c	35c	25c
Occidental	....	....	....	....	1	80c	1	50c
Ophir	36	33¾	35¾	33	36½	31	35½	33½
Oriental	65c	....	1½	80c	70c	50c	50c	....
Overman	9¾	9½	10	9½	11¾	9¾	12½	10⅝
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	30c	25c	40c	25c	50c	40c	45c	25c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	8⅜	7½	6½	5	8½	7	7	5¾
Richer	50c	40c	....	....	....	....	75c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	10½	9¾	13¾	10¾	16	13½	16	14
Seg Belcher	18	17	20	....	21	20	23	20
Sierra Nevada	43½	37½	43	41	56	42	49¼	44
Silver Hill	1⅞	1.30	2½	1.40	1⅞	1.55	2.40	1.70
Silver King	10	....	....	....	....	....	....	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	25c	20c	30c	20c	50c	20c	1½	50
Summit	1.30	80c	1½	1½	2¼	1.60	2¾	1½
Scorpion	1	50c	....	....	1.60	55c	1½	1¼
Solid Silver	50c	....	50c	....	1.80	50c	1	70c
South Bodie	....	....	25c	....	....	....	25c	20c
South Standard	25c	....	....	....	10c	....	....	....
Star	50c	....	50c	....	50c	....	80c	....
St. Louis	....	....	....	....	70c	30c	55c	40c
Syndicate	1½	....	....	....	....	....	85c	....
Tioga Con	1½	1	1.20	1	1.60	1½	1.70	1½
Tiptop	1.40	1½	1.30	1½	1.20	1	1.20	1
Trojan	30c	25c	60c	30c	50c	....	50c	40c
Union Con	58	62	58½	56	63	56¾	60½	50
Utah	11¾	10⅞	13¾	11½	22	13½	18¾	16¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	1½	50c	75c	70c	75c	65c	95c	75c
Wells-Fargo	20c	15c	20c	15c	20c	....	20c	15c
Woodville	25c	....	....	....	50c	20c	50c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	14⅝	13¼	16½	13¾	20	16½	22¾	19

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 17.
860 Alta.....7¾@8
255 Alpha.....14@14¼
350 Andes.....60c
290 Best & Belcher...22@21¾
2235 Bullion.....9@8¾
705 Belcher.....5½@5¾
460 Benton.....4⅝@4.60
950 Baltimore Con.....1¼@1½
335 Con Virginia.....8⅝@8½
515 California.....9½@9⅝
130 Chollar.....51@50½
2875 Con Imperial.....1@1.10
775 Caledonia.....3¼@3.20
495 Confidence.....17½@17
1310 Challenge.....3.05@2.95
200 Con Washoe.....1½
250 Dardanelles.....1.30
1870 Exchequer.....6@6¼
175 Flowery.....15c
450 Grand Prize.....6⅝@6½
655 Gould & Curry...14¼@14⅝
315 Hale & Nor.....16½@18¼
260 Justice.....4.40@4¼
2880 Julia.....4.20@4.45
695 Kentuck.....7@8
200 Kossuth.....15c
105 Lady Wash.....1½
125 Lady Bryan.....70@75c
550 Leviathan.....55@60c
250 Mexican.....33¾@34¼
100 Mt Hood.....50c
900 N Sierra Nevada.....5c
170 North Con Vir.....7½@7
930 N Bonanza.....1½@1⅝
360 New York.....70@75c
750 Overman.....12½@11¾
165 Ophir.....35½@35
570 Phil Sheridan....45@30c
470 Sierra Nevada...49¼@48½
910 Savage.....16@15½
1005 Silver Hill.....1.80@1.70
1180 Solid Silver.....90c@1
300 Sutro.....20c
1480 Succor.....50@55c
20 Scorpion.....1.40
700 Trojan.....50c
260 Union Con.....60½
105 Utah.....18½@18¾
1700 Wells-Fargo.....15@20c
790 Ward.....95@90c
1275 Yellow Jacket.....22@22¾

AFTERNOON SESSION.
8090 Argenta.....60@65c
100 Albion.....50c
310 Bechtel.....1
880 Bodie.....8½@8¾
100 Belmont.....50c
330 Bulwer.....14@14¾
1160 Booker.....30c
200 Black Hawk.....70@75c
140 Belvidere.....50c
500 Dudley.....1
100 Day.....25c
300 DeFrees.....10c
425 Eureka Con.....29@28¾
300 Endowment.....30@35c
250 Goodshaw.....30@35c
740 Grand Prize.....4@3.90
250 Gila.....15@20c
50 Hamburg.....1½
100 Hillside.....2.10
1250 Highbridge.....1¾@1.80
315 Leeds.....1
60 McClinton.....50@40c
130 Manhattan.....3½@3¾
20 Mono.....2¾
100 Martin White.....5¼
1050 Modoc.....50c
1050 Navajo.....35@30c
150 Northern Belle.....7
2040 Paradise.....2.60@2.35
730 Raymond & Ely....7@6½
770 Summit.....2¼
200 South Bodie.....20c
600 S Bulwer.....90@80c
450 Tuscarora.....5c
400 Tioga Con.....1½@1.40
700 Tiptop.....1

Saturday A.M., Jan. 18.
100 Alpha.....12¾@12½
370 Alta.....7½
140 Andes.....55@50c
400 Albion.....50c
1210 Argenta.....65@70c
750 Belmont.....50c
350 Best & Belcher..21½@22¾
1515 Bullion.....8½@8¾
150 Belcher.....5
1280 Bodie.....8¾@9
600 Baltimore Con...1.35@1¼
950 Benton.....4½@4¼
910 Bechtel.....1
50 Bulwer.....15
100 Belvidere.....50c
100 Champion.....40c
425 Con Virginia.....8⅝@8¾
670 California.....9¾@9½
435 Confidence.....14½@15
80 Chollar.....48½@48
280 Crown Point.....6@5⅝
3265 Con Imperial.....1.05@1
1040 Challenge.....2.70@2½
245 Caledonia.....3@3.05
20 Con Pacific.....1⅝
1200 Caledonia (B H).....1
250 Day.....25c
755 Exchequer.....5¾@6
150 Eureka Con.....28¾
1220 Gould & Curry....14@13¾
845 Grand Prize...4.40@4.30
720 H & Norcross.....16½
100 Hussey.....20c
450 Independence.....1½@1¾
125 Justice.....4½@4.20
1635 Julia.....4½@4.35
320 Kentuck.....6½@5¾
100 L Bryan.....70c
20 Leopard.....70c
25 Leeds.....1.10
300 Lady Wash.....1½@1.30
210 Mexican.....34½
50 Mt Hood.....50c
50 Morning Star.....3½
200 Manhattan.....3½
200 McClinton.....40c
90 New York.....70@75c
745 N Bonanza.....1½@1.35
250 Northern Belle.....7@6
200 N Sierra Nevada.....5c
400 Navajo.....30c
140 Ophir.....35½@35
820 Overman.....11½@11⅝
10 Occidental.....50c
640 Phil Sheridan.....35c
750 Paradise.....2.40@2½
255 Raymond & E.....6@5¾
365 Savage.....14¾@14
1420 Succor.....50c
320 Sutro.....20c
280 Sierra Nevada....48½@49
845 Silver Hill.....1.80@1.70
220 Solid Silver.....90c
355 Scorpion.....1.45@1½
50 Star.....80c
100 Summit.....2¼
1300 S Bulwer.....85c
255 Tioga Con.....1½@1.45
1100 Trojan.....50@45c
450 Tuscarora.....5c
50 Tiptop.....1
75 Union Con.....59
405 Utah.....18@17¾
750 Ward.....90@80c
1040 Wells-Fargo.....15c
210 Woodville.....50@40c
660 Yellow Jacket....19¾@20

Monday A.M., Jan. 20.
160 Alta.....7¾@7½
105 Alpha.....13
50 Andes.....55c
195 Best & Belcher...22½@22¾
400 Baltimore Con.....1½
485 Belcher.....5½@5½
1045 Bullion.....8½@8¾
630 Benton.....4½@4¾
390 California.....9½@9¾
300 Con Virginia.....8⅝@8½
625 Crown Point.....5½@5⅝
3100 Con Imperial.....1
40 Chollar.....48¾
495 Challenge.....2¾
420 Caledonia.....3.05@3.1
165 Confidence.....15¾@16¼
470 Exchequer.....6@5¾
850 Gould & Curry....14@13¾
200 Geo Douglas.....50c
560 Hale & Nor.....17¾@18¼
475 Justice.....4⅛@4.05
1395 Julia.....4@3.90
100 Kentuck.....6¼
500 Kossuth.....15c
350 Lady Bryan.....75c
2695 Leviathan.....75@90c
130 Lady Wash.....1¼
85 Mexican.....33¾@32½
100 Mt Hood.....50c
10 North Con Vir.....7
675 N Bonanza.....1½
260 New York.....70@75c
55 Ophir.....35
105 Overman.....11¼@11⅝
50 Occidental.....1
250 Phil Sheridan.....35c
1400 Solid Silver.....90@80c
435 Savage.....14¾@14½
445 Sierra Nevada.....48½@48
875 Silver Hill.....2
200 St Louis.....40c
950 Succor.....1@1.10
35 Scorpion.....1½
450 Trojan.....40c
250 Utah.....18¼@18
145 Union Con.....59½@59¾
100 Wells Fargo.....15c
1050 Ward.....75c
50 Woodville.....40c
825 Yellow Jacket.....20@21

AFTERNOON SESSION.
6075 Argenta.....70@80c
220 Albion.....50c
295 Belmont.....50@60c
250 Bulwer.....15@14⅞
150 Bodie.....7¾@8
200 Bechtel.....75c
1200 Booker.....25@30c
200 Belvidere.....60c
1600 Belle Isle.....20c
150 Black Hawk.....70c
100 Champion.....40c
40 C Pacific.....1.70@1¾
110 Dudley.....1.10@1
60 Day.....25c
135 DeFrees.....5c
65 Eureka Con.....26½
1500 Endowment.....30@25c
1105 Grand Prize.....5@4¾
250 Goodshaw.....30c
100 Hussey.....20c
100 Hillside.....2¼
240 Independence....1.60@1¾
200 Jackson.....7½
30 Leeds.....1
200 Leopard.....50c
225 Manhattan.....3½
170 Mono.....2¼@2.10
2000 Modoc.....60@55c
500 McClinton.....35@30c
595 Northern Belle.....6½@6
460 Navajo.....30@25c
435 Oriental.....50c
1200 Paradise.....2½
400 Raymond & Ely..6½@6½
190 S Bodie.....25c
2150 S Bulwer.....90c@1
250 Summit.....2.15@2¼
50 Star.....80c
20 Tiptop.....1.20
300 Tuscarora.....5c
470 Tioga Con.....1.70

Tuesday A.M., Jan. 21.
200 Alpha.....12¾@13
915 Alta.....7¾@8¼
120 Andes.....50c
285 Best & Belcher...22½@22¾
305 Belcher.....4¾@4.85
1380 Bullion.....8@7¾
815 Benton.....4.65@4¾
720 California.....9½@9⅝
435 Caledonia.....3.10@3
750 Con Virginia.....8⅜@8½
2580 Con Imperial...95c@1.05
60 Chollar.....47½
335 Crown Point.....5⅝@5¾
495 Confidence.....15¼@15
765 Challenge.....2¾@2.65
250 Dardanelles.....1.30
355 Exchequer.....5¾@5½
920 Gould & Curry...13¼@13½
200 Geo Douglas.....50c
490 H & Norcross.....17@16⅝
440 Justice.....4.10@4.15
2375 Julia.....3.60@3.45
190 Kentuck.....5¼@5⅝
640 Kossuth.....20@15c
410 Lady Bryan.....70@75c
198 Lady Wash.....1¼@1
2515 Leviathan.....1@80c
240 Mexican.....33@33¼
250 Mides.....1½
100 Morning Star.....3¼
370 Mt Hood.....50@45c
70 New York.....75c
320 North Con Vir.....5¼@5½
1025 N Bonanza.....1.30@1½
90 Ophir.....35@34¼
305 Overman.....11@10⅝
655 Phil Sheridan.....35c
470 Sierra Nevada....46@45¼
55 Savage.....14½@14¼
10 Seg Belcher.....20
510 Silver Hill.....2
810 Succor.....1.10@1½
100 St Louis.....50c
425 Sutro.....20c
160 Scorpion.....1¼@1½
1450 Solid Silver.....80c
300 Trojan.....45c
140 Utah.....17@17¼
60 Union Con.....58
50 Woodville.....35c
460 Wells-Fargo.....20@15c
1380 Ward.....70@75c
1185 Yellow Jacket.....19½@20¼

AFTERNOON SESSION.
2300 Argenta.....60@55c
100 Albion.....50c
120 Bulwer.....14¾
345 Bodie.....8½
650 Booker.....30c
225 Belmont.....60c
480 Bechtel.....1@75c
30 Black Hawk.....75c
100 Belvidere.....70@75c
1000 Belle Isle.....20c
150 C Pacific.....1.70@1½
500 Chieftain.....10c
200 Dudley.....1
400 Day.....30c
535 Endowment.....30@25c
190 Eureka Con.....26
550 Goodshaw.....30@35c
200 Golden Chariot.....15c
1375 Grand Prize.....4.40@4½
700 Highbridge.....1.70@1¾
100 Hillside.....2.15
600 Independence..1.65@1.55
250 Jackson.....7½@7¼
70 Leopard.....30c
445 Mono.....2@1¾
155 Manhattan.....3.60
1720 Modoc.....60@50c
600 McClinton.....40@30c
35 M White.....5
20 Northern Belle.....6⅝
2800 Navajo.....30@25c
100 Oriental.....60@75c
1250 Paradise.....2@2.10
50 Raymond & Ely.....6⅝@7
100 Richer.....75c
620 Summit.....2.10@2
1200 Star.....50c
850 S Bulwer.....95@90c
100 Tuscarora.....5c
230 Tiptop.....1
725 Tioga Con.....1.70

Wed'sday A.M., Jan. 22.
205 Alpha.....12½@13
330 Alta.....8
360 Andes.....50c
455 B & B.....21¾@21⅝
755 Bullion.....7¾@8
640 Belcher.....4½@4.40
300 Benton.....4¾@4.70
50 Chollar.....47
1020 Con Virginia.....8@7¾
240 California.....9¼
595 Crown Point.....5
485 Caledonia.....3
4270 Con Imperial.....95c@1
110 Confidence.....14¾@15
430 Challenge.....2½
1470 Exchequer.....5¾@5½
450 Gould & Curry...13¼@13½
190 Geo Douglas.....40c
430 Hale & Nor.....16⅝@16¾
950 Justice.....4@4.05
325 Julia.....3.30@3.40
1900 Leviathan.....85@70c
400 Lady Bryan.....70@60c
225 Lady Wash.....1½
65 Mexican.....33@32½
10 Morning Star.....3
100 North Con Vir.....5½
150 New York.....70@75c
445 N Bonanza.....1½@1.30
50 Occidental.....1
140 Overman.....10⅝
170 Ophir.....33½@33¼
1395 Phil Sheridan.....25@30c
315 Succor.....1.40@1.35
245 Savage.....14¼@14⅝
505 S Nevada.....44@45½
50 Scorpion.....1½
700 Solid Silver.....80c
360 Silver Hill.....2¼@2.15
200 Utah.....16¼@16½
50 Union.....58
80 Ward.....80c
1000 Wells-Fargo.....20@15c
985 Yellow Jacket.....19½@19

AFTERNOON SESSION.
1100 Argenta.....60@55c
150 Belvidere.....70@65c
150 Belmont.....60c
200 Bulwer.....14¾
150 Bechtel.....1
540 Belle Isle.....20c
570 Bodie.....8@7¾
95 C Pacific.....1½
400 Dudley.....1
95 DeFrees.....15c
365 Day.....25@20c
100 Eureka Con.....26¼@26
450 Endowment.....30c
1030 Grand Prize.....4¼@4.10
1400 Goodshaw.....30c
100 Hamburg.....1½
300 Hillside.....2.10@1.80
200 Highbridge.....1.55
750 Independence...1½@1.40
100 Jackson.....7
160 Leopard.....40c
100 Leeds.....1
50 Modoc.....55c
100 Manhattan.....3.60@3½
180 McClinton.....25@40c
390 M White.....5
100 Mono.....1.65
220 Northern Belle.....6@7
120 Navajo.....30@25c
625 Paradise.....2½
230 Raymond & Ely.....6¾
800 Summit.....1.60@1¾
100 Syndicate.....2
350 S Bulwer.....85c
100 Tioga Con.....1.60
50 Tiptop.....1

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Jan. 16.
205 Alpha.....12½@12½
1105 Alta.....6¾@7½
100 Andes.....60c
395 Best & Belcher...22½@22½
700 Belcher.....4¾@4.80
905 Bullion.....8½@8¾
205 Benton.....4.10@4¼
700 Baltimore Con.....1½@2¼
755 California.....9⅝@9⅝
650 Con Virginia.....7½@8
690 Crown Point.....5½@5⅝
80 Chollar.....49@50
4010 Con Imperial.....90@95c
230 Confidence.....13¾@14
780 Caledonia.....3.05@3.10
675 Challenge.....2¾@2.80
700 Exchequer.....5½@5¼
10 Flowery.....50c
800 Gould & Curry....15@15½
440 Hale & Nor.....17½@18
510 Justice.....4.35@4.45
1700 Julia.....3.70@3.80
655 Kentuck.....5¾
120 Lady Wash.....1¼@1.30
410 Lady Bryan.....70c
500 Leviathan.....50@55c
445 Mexican.....33½@33¾
525 New York.....70@75c
160 North Con Vir.....7½
80 Ophir.....34¾
1045 Overman.....11½@11¾
975 Phil Sheridan...1¼@1.45
585 Sierra Nevada....51¼@53
1365 Savage.....15@15½
440 Succor.....20@30c
750 Silver Hill.....1.60
850 Solid Silver.....1@1.10
300 Trojan.....50c
575 Union Con.....60@61½
190 Utah.....18@18⅝
450 Ward.....75c
50 Woodville.....30c
235 Yellow Jacket...19¾@19⅝

AFTERNOON SESSION.
5200 Argenta.....60@70c
90 Bulwer.....15
1110 Bodie.....8½@8½
50 Bechtel.....1
150 Belmont.....50c
300 Belle Isle.....20c
975 Booker.....30@35c
20 Belvidere.....60c
20 Black Hawk.....60c
750 Chieftain.....10c
290 Caledonia (B H)..1@1.15
1140 Dudley.....1.05@1¼
410 Eureka Con.....28¾@29
300 Endowment.....30c
400 Gila.....20c
950 Goodshaw.....35@30c
3820 Grand Prize...3.95@4.10
800 Highbridge.....1¾
500 Hillside.....2.10@2¼
1900 Independence..1.35@1.40
50 Jackson.....7½
300 Leeds.....1
315 Manhattan.....3½@3¾
315 Modoc.....50@55c
100 McClinton.....30c
220 Navajo.....35c
110 Northern Belle....7½@7¼
655 Oriental.....50@75c
525 Paradise.....2.60@2.70
360 Raymond & Ely...7¾@8½
1060 Summit.....2¼@2½
2700 Star.....50@60c
1300 Tuscarora.....5c
400 Tioga Con.....1½@1.30
210 Tiptop.....1

Thursday A.M., Jan. 23.
200 Alta.....8½@8⅝
820 Alpha.....14¾@15
200 Andes.....45@50c
250 Best & Belcher.....22
640 Bullion.....8½@8⅝
280 Belcher.....4¾@4.80
200 Baltimore Con.....1½
1100 Benton.....4.85@4.90
340 Caledonia.....3.05@3.10
1250 Con Imperial..1.10@1.15
160 California.....9⅝
240 Challenge.....2.60@2¾
360 Con Virginia.....7⅞@8
875 Confidence.....16¾@17
40 Chollar.....49
290 Crown Point.....5⅝@5¾
1365 Exchequer.....6¼@6½
480 Gould & Curry...13⅝@13¾
100 Geo Douglas.....50c
325 Hale & Nor.....17¼@17⅝
160 Justice.....4.30
905 Julia.....3.80@3.85
150 Kentuck.....6
100 Kossuth.....20c
70 Lady Wash.....1¼
700 L Bryan.....75@70c
1050 Leviathan.....70@75c
260 Mexican.....34½@34¾
480 Mides.....1¼
300 New York.....75c
195 N Con Virginia.....6@6½
400 N Sierra Nevada.....5c
200 N Bonanza.....1½@1.45
80 Ophir.....34¾
250 Overman.....10¾@11
1960 Phil Sheridan.....25@30c
590 Sierra Nevada....46½@47¼
1010 Savage.....14⅝@14¾
40 Seg Belcher.....23
750 Silver Hill.....2.35@2.40
500 Succor.....1.40@1½
800 Sutro.....20c
30 Scorpion.....1¼
450 Solid Silver.....70@75c
50 St Louis.....55c
240 Utah.....18¼@18½
75 Union.....59½
340 Wells-Fargo.....20@15c
780 Ward.....85@80c
1120 Yellow Jacket...20½@20¼

AFTERNOON SESSION.
1330 Argenta.....70@75c
750 Belmont.....60@65c
700 Belle Isle.....20c
230 Bodie.....7½@8
100 Black Hawk.....65c
400 Booker.....40@50c
75 C Pacific.....1½
100 Day.....1
500 Endowment.....25c
15 Eureka Con.....27@27½
600 Grand Prize.....4.15@4½
100 Golden Chariot.....20c
300 Goodshaw.....30c
200 Hussey.....15c
1100 Highbridge.....1½@1.70
120 Hillside.....1.90@2
200 Independence.....1.40
50 Leeds.....1
335 Leopard.....25@30c
180 Modoc.....60c
125 Martin White.....5
180 Mono.....1.65@1¾
400 McClinton.....35@40c
10 Manhattan.....3.60
265 Northern Belle.....6½
170 Navajo.....25@30c
650 Oriental.....50c
815 Paradise.....3@3½
70 Raymond & Ely.....6¾@7
100 S Bulwer.....70c
1280 Summit.....1½
130 Syndicate.....2@2¼
5 Silver King.....7
600 Tioga.....1.35
150 Tiptop.....1.10
500 University.....1

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	13	1 00	Dec 10	Jan 13	Jan 31	W H Watson	302 Montgomery st
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belmont M Co	Nevada	19	50	Nov 27	Jan 3	Jan 27	J W Pew	310 Pine st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Benton Con M Co	Nevada	1	50	Dec 11	Jan 15	Feb 3	W H Watson	302 Montgomery st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Bullion M Co	Nevada	8	1 00	Dec 3	Jan 7	Jan 29	Joseph Gruss	418 California st
Crown Point G & S M Co	Nevada	36	1 00	Dec 12	Jan 16	Feb 6	James Newlands	203 Bush st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Hale & Norcross S M Co	Nevada	60	50	Dec 10	Jan 15	Feb 7	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
Maybelle Con M Co	California	2	10	Jan 21	Feb 25	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Modock Con M Co	California	7	50	Nov 14	Jan 13	Jan 30	J W Pew	310 Pine st
Mono M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
North Bonanza M Co	Nevada	1	50	Dec 6	Jan 10	Jan 28	W W Stetson	309 Montgomery st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Resolute T & M Co	California	1	10	Dec 28	Feb 3	Mar 3	J L Fields	240 Montgomery st
Savage M Co	Nevada	36	1 00	Dec 4	Jan 7	Jan 27	E B Holmes	309 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	G R Spinney	310 Pine st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 24	Feb 13	W H Lent	327 Pine st
Vermont Con M Co	Nevada	2	15	Dec 7	Jan 9	Jan 29	E F Stone	306 Pine st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance M Co	California	2	50	Dec 19	Jan 28	Feb 21	B Lengley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Arizona S M Co	Nevada	4	1 00	Dec 9	Jan 13	Feb 3	W Willis	309 Montgomery st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Jan 28	B S Kellogg	306 Pine st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Catawba M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Eagle S M & M Co	Nevada	11	10	Nov 30	Jan 7	Jan 28	R H Brown	327 Pine st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Mar 13	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N C Walton	324 Pine st
Hazard Gravel M Co	California	2	06	Dec 9	Jan 8	Jan 24	J T McGeoghehau	318 Pine st
Lodi M Co	Nevada	1	25	Nov 20	Jan 7	Jan 27	O J Humphrey	328 Montgomery st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	318 Pine st
Mariposa Land & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower M Co	California	2	15	Dec 7	Jan 4	Feb 4	J Morizio	328 Montgomery st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	24 Safe Deposit Build
Mineral Fork M & S Co	Utah	1	02	Oct 31	Dec 7	Jan 30	Otto Metchke	328 Montgomery st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 5	J Pentecost	511 California st
Noonday M Co	California	1	10	Jan 2	eb 6	Feb 27	G A Holden	310 Pine st
Orion M Co	California	4	25	Dec 12	n 13	Jan 28	P Conklin	28 Sansome st
Pleiades G & S M Co	Nevada	2	05	Dec 21	an 24	Feb 18	W L Oliver	328 Montgomery st
Queen Bee M Co	California	1	25	Dec 2	Jan 6	Jan 27	T A White	113 Leidesdorff st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	6	05	Nov 19	Jan 6	Feb 4	J W Clark	318 Pine st
Summit G M Go	California	1	50	Nov 27	Jan 6	Jan 28	W H Lent	327 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belcher M Co	Washoe	Jno Crockett	203 Bush st	Annual	Jan 28
Equitable Tunnel & M Co	Utah	Chas J Collins	227 Montgomery st	Special	Jan 31
Manhattan S M Co	Nevada	John Crocket	203 Bush st	Annual	Feb 5
North Con Virginia M Co	Nevada	G C Pratt	309 Mongomery st	Annual	Feb 5
Raymond & Ely M Co	Nevada	J W Pew	310 Pine st	Special	Jan 28
Raymond & Ely S M Co	Nevada	J W Pew	310 Pine st	Annual	Jan 28
Twin Peaks M Co	Nevada	T W Colburn	414 California st	Annual	Jan 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Jan 13

Pacific Board—Latest Sales.

Wed'sday A.M., Jan. 22.
50 Alpha.....13
175 Alta.....8½
70 Belcher.....4½
100 Best & Belcher.....22
170 Bullion.....7¾@8
120 Con Virginia.....8@7¾
2750 Con Imperial.....1@1.05
90 Crown Point.....5⅜@5.20
150 California.....9⅝
340 Caledonia.....3@2.9
115 Exchequer.....5.80@5¾
240 Gould & Curry...13½@13⅝
40 Hale & Nor.....17@17½
60 Justice.....4½
440 Julia.....3.55@3.45
20 Kentuck.....5¾
60 Mexican.....33¾
180 Ophir.....33¾@34
340 Savage.....14½@14¾
70 Sierra Nevada....44½@45
290 Silver Hill.....2.20
40 Utah.....16¾
200 Yellow Jacket...19½@19⅝

AFTERNOON SESSION.
10 Alta.....8⅞
35 Argenta.....55c
110 Alpha.....13¾@13⅞
160 Benton.....4.80@4⅞
70 Bullion.....8¼@8⅜
60 California.....9⅝
4335 Con Imperial..1.05@1.10
110 Exchequer.....6
20 Gould & Curry...13½@13⅝
100 Geo Douglas.....50c
20 Hale & Nor.....17½
70 Justice.....4½@4.20
290 Julia.....3.80@3.90
170 Kossuth.....20c
50 N Bonanza.....1.30
75 New York.....80c
10 Ophir.....34¼
100 Phil Sheridan.....30c
300 S Utah.....18c
610 St Louis.....60c
500 S Bulwer.....85c
15 Sierra Nevada.....45
220 Silver Hill.....2¼@2.30
50 Trojan.....40c
350 Ward.....90c
20 Yellow Jacket...19⅜@19½

California Board—Latest Sales.

Wed'sday A.M., Jan. 22.
30 Alta.....7½
150 Atlantic.....75c
600 Ætna.....75c
300 Atlas.....12c
100 Atlanta.....9c
200 Belmont.....65c
80 Best & Belcher...22@21¾
40 Belcher.....4½
110 Bullion.....7⅞@8
70 California.....9¼@9⅝
40 Con Virginia.....8
300 Con Imperial.....98c@1
40 Crown Point.....5½
135 Caledonia.....3.05
60 Exchequer.....5½
110 Gould & Curry...13½@13¾
500 Globe.....3c
200 Golden Chariot.....15c
60 Hale & Norcross.16⅝@16¾
40 Justice.....4½
445 Julia.....3½@3.30
650 Kossuth.....18c
100 Leviathan.....85c
50 Mexican.....33¼
200 Mackey.....1½
180 Mt Hood.....40c
200 N Monumental.....3c
40 Ophir.....34
30 Savage.....14½
40 Sierra Nevada....42@42½
100 St Louis.....75c
100 Trojan.....44c
200 Twin Peaks.....2c
1000 U Flag.....1c
30 Yellow Jacket.....19⅝

AFTERNOON SESSION.
30 Alpha.....13¼
750 Atlanta.....25c
325 Ætna.....75c
500 Atlas.....17c
60 Alta.....8⅝@8½
30 Bullion.....6½
60 Best & Belcher...21¾@21¾
50 Belcher.....4.60
100 Black Hawk.....85c
190 Belmont.....60c
70 Con Virginia.....8@8½
50 Crown Point.....5⅝
1000 Con Imperial.....1.05
50 California.....9⅝@9½
50 Caledonia.....3.20
500 Coso Con.....5c
70 Exchequer.....5¾@6
100 Enterprise.....1
90 Gould & Curry...13⅝@13⅝

50	Golden Chariot	20c	
60	Hale & Nor	17@16½	
110	Julia	3½@3.70	
880	Justice	4.05@4.1	
50	Kentuck	8	
200	Leviathan	80c	
130	L Bryan	70c	
60	Mexican	33½@33¾	
20	N Con Vir	5½	
500	North Carson	19c	
600	N Sierra Nevada	70@8	
30	Ophir	34	
100	Phil Sheridan	30c	
100	St Louis	70c	
70	Savage	14½@14½	
30	Sierra Nevada	45	
220	Silver Hill	2.20@2.10	
400	Santiago	1@1¼	
300	Trojan	42@41c	
40	Union Con	58	
115	Wales	3½@3½	
100	Ward	32½c	
20	Yellow Jacket	19½	

Mining Share Market.

The market during the past week has run pretty even, with some improvement shown in the shares of leading Comstock mines. This improvement has not been due to any actual developments made meantime, but to a growing belief, or rather hope that such would soon occur at some point along the line of the deep explorations now in progress there. There seems also to be a growing conviction in the public mind, that these mines are likely to be administered with more economy hereafter, than has in times past characterized their management. That the burdens heretofore imposed upon this class of shareholders will be somewhat lightened, for a time at least, may reasonably be hoped for, as most of the prominent companies have now got their working and prospecting shafts sunk to great depths, have these shafts well outfitted with powerful hoisting and pumping machinery, some of them being also supplied with extensive reduction works, their current expenses ought not to be very heavy for some time to come. Besides these costly equipments, much dead work has been done, further diminishing necessary preliminary expenditures in the future. The Comstock mines have now been put in easy communication with the outside world, and with the fuel and lumber supplying woodlands, as well also as with many of the larger reduction works, through the construction of railroads, securing to them great advantages. Then it may be expected that some gains will accrue to the various companies prosecuting deep explorations through the completion of the Sutro tunnel, now sufficiently advanced to be of service to a portion of them. During the week a couple of the so-called "bucket shops" operating in this city, which had before been partially strangled, have been effectually choked to death. If there are any more of these swindling concerns left, it is to be hoped that they will in like manner undergo speedy strangulation. As our mining shares are being extensively listed on the New York Stock Boards, there seems a probability that they will meet with considerable sales in the East, provided that these offerings embrace only stocks of solid merit. It will be to the interest of companies intending to avail themselves of this new opening for the sale of their shares, that it be not deluged with the stocks of "wildcat" concerns, of which we have such a super-abundance on this coast.

The Fire-Boat.

Messrs. Dickson, De Wolf & Co. have sent the following handsome compliment to the Harbor Commissioners, touching the powerful fire-boat *Governor Irwin*.

To the Honorable, the Board of Harbor Commissioners, San Francisco—GENTLEMEN: In the name of the owners of the ship *River Nith*, we have to give you our sincere thanks for your great politeness and promptitude in tendering us the use of the fire-boat *Governor Irwin*, on Saturday last, when the cargo of the *River Nith* was discovered to be on fire. The efficiency of the *Governor Irwin* in extinguishing fires is undoubted, and the quiet, unostentatious and active exertions of the Captain and his crew beyond praise. Though in business here for a number of years, it has been very seldom that we have had the pleasure to be so thoroughly satisfied with any occurrence as that in the assistance rendered to us by yourselves and the *Governor Irwin*. We have the pleasure to remain, gentlemen, your most obedient servants,

DICKSON, DE WOLF & CO.

The fire-boat alluded to, we described in detail a short time since. She has two of the well-known type of Hooker patent steam pumps, manufactured by W. T. Garratt. These pumps have 15½-inch steam cylinders, 9-inch water cylinders, and 24-inch stroke. When at work they throw a deluge of water, about equal to what would be thrown by eight of the best steam fire-engines. The fire-boat has been a great success, its efficiency being universally recognized wherever it has been used.

Bullion Shipments.

Since our last issue shipments of bullion have been as follows: Standard, Jan. 14th, $14,579.40; Northern Belle, Jan. 13th, $3,184.40; Alexander, Jan. 18th, $6,000; Tyho Con., Jan. 13th, $7,914.78; Grand Prize, Jan. 20th, $23,000; California, Jan. 18th, $94,259.02; Bodie, Jan. 17th, $17,000; Northern Belle, Jan. 15th, $2,574.52; Hillside, Jan. 20th, $5,950; Christy, Jan. 20th, $6,481; Con. Virginia, Jan. 18th, $29,288.42; Tybo Con., Jan. 14th, $4,045.16; Standard, Jan. 18th, $15,561.58; Ophir, Jan. 18th, $20,789.19; Tybo Con., Jan. 17th, $4,064.60; Argenta, Jan. 19th, $5,847.38.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

THE MONTERICHARD.—*Dispatch*, Jan. 18: The sinking of the last one hundred feet in the Monterichard mine will probably be completed this evening—making the mine now about 360 feet in depth. Some of the rock from the bottom of this shaft has been brought into our office, which, indeed, has a very flattering look. It appears to be of a much better quality than that taken from nearer the surface, besides being very rich with black sulphurets, which has heretofore been very scarce in the developed portion of the mine. The lead continues its width of from two to three feet, with no indication of narrowing. The miners think the rock will average a yield of $25 per ton.

THE rumor of the caving of the Pennsylvania mine, to which we referred last week, proves to have been well founded. The poorly-timbered shaft gave way, the mill was rendered useless and about fifty square feet of the surface caved in. It is wonderful that no lives were lost. A new shaft will have to be sunk and the mill have to be moved. Next time it is to be hoped that the work will be done with a view to security and not for cheapness.

THE old Drytown, or Seaton, as it is better known, has been started up again by the owners of the Little Amador company, under the superintendency of Mr. R. Johns. They are at present engaged in cleaning out the old tunnel. It is said they intend putting up new hoisting works some time next spring.

THE Centennial company are still running their mill of 20 stamps. It is rumored that the company have declared an assessment of ten cents per share.

THE mill for the Moore mine is nearing completion, and will probably be ready for operation by the time the necessary piping, etc., are completed for the conduction of water. A large quantity of splendid rock is now on the dump awaiting the readiness of the mill.

BUTTE.

AN OLD MINE RE-OPENED.—*Mercury*, Jan. 17: Work was resumed Monday upon the old Banner mine, located across the river, four miles from the city, at the foot of Table mountain. At one time, in the days of old, when this was one of the most prosperous mining districts on the coast, the Banner mine was a bonanza, and was believed to be the richest mine in the State. In 1860, a cave occurred on the claim and work was discontinued. Since that time it has lain idle. Prior to this mishap, the proprietors, Messrs. J. McSmith and E. M. Sparks, had made fortunes out of the property and therefore neglected to repair the damage done by the disaster and continue operations. Recently San Francisco operators and capitalists have been negotiating for an interest in the mine, which they have now secured, and one of the principal owners, Mr. Kinney, informs us that the company intend to push the work and develop the resources of the claim to their fullest extent. The intention is to sink a shaft through the *debris* until the old workings are reached and then resume operations where the former operations ceased. Mr. McSmith retains an interest and will act as Superintendent of the work. A quartz mill will be erected as soon as necessary, and judging from the past record of the lode, there can be no doubt but what the company will reap a rich harvest.

CALAVERAS.

INCEPTION OF A GREAT ENTERPRISE.—*Chronicle*, Jan. 18: Next Monday morning work will be commenced, by the Happy Valley Blue Gravel and Hydraulic M. Co., in prosecution of the great enterprise to which references have previously been made in this paper. To refresh the recollections of our readers, however, we will repeat that the company was formed for the purpose of working the well known Sport Hill and Happy Valley hydraulic mines, embracing a large scope of rich gravel. The principal obstacle now in the way of profitably working the ground is the want of "dump" and the attention of the company will be first directed to supplying that deficiency. With that object in view a tunnel is to be run from the slope extending down to the Calaveras river through to the mining ground designed to be worked—starting at a point low enough to drain the deepest part of the "diggings" and to give the flume an abundance of "fall." The survey of the tunnel is just completed. The great bore will be 3,262 feet in length, five feet wide on the bottom and seven feet high. We understand that contracts have already been let and that ground will be broke next Monday morning. It is an undertaking of magnitude, but it is the opinion of miners generally that the enterprise will eventually prove a profitable one.

GWIN MINE.—Everything continues to progress favorably at the Gwin mine. All the stamps are kept in constant operation, the batteries being fed, principally, from the 1400-foot stopes. The ore mined is not especially high grade, but the quality of the rock is sufficiently good to permit of the declaration of handsome dividends monthly. The 1500 level is still being extended north and very fair ore is being taken from the higher stopes. The Gwin mine has been a steadily paying property for years, and while there is no probability that it will ever discontinue its golden favors, the indications are favorable to an enchanced yield in the near future.

EL DORADO.

THE MINES.—*Mountain Democrat*, Jan. 18: The new pumps are at work in the Springfield mine. The shipments are the same as usual, and the rock looking well. The McNulty mine has been thoroughly prospected, and the Superintendent is confident of success. Accordingly a mill and hoisting works are in course of erection at the mine. The German mine, near the McNulty, is being worked by a company from San Francisco, and is paying well. The rock taken from the Central mine, near the Springfield, promises to pay well, and will be thoroughly tested by the company in charge. The Pocohontas mill made a four days' run on rock from the Condo & Williams mine, and cleaned up $4,000. Work has been discontinued for a time in the Pocohontas mine, but the mill is kept running on rock from different mines. It has made quite a lively little burg of Logtown.

INYO.

KEARSARGE.—*Independent*, Jan. 18: The work of deep mining on the south side of Kearsarge hill, by means of a deep base tunnel, has been settled upon by the Kearsarge company, and the enterprise begun by laying in timbers and commencing the preliminary grading. The tunnel, as reported to us, is to be wide enough for a double track and will start into the mountain immediately above the mill. It will be from 1,500 to 2,000 feet in length, cutting known stratas and ledges from 400 to 1,100 feet in depth. The concern is backed up by fresh capital and the work in hand is to be speeded by all modern methods of power drills, etc.

THE MODOCK.—Work on the tunnel is progressing here as usual, though the power drill has got into soft ground, in which it does not make quite as rapid progress as in harder rock, where the concussion of the drill would more perfectly clear the hole of dust. Nevertheless, fair progress in the tunnel is being made, and never at such comparatively small cost in all departments as here of late—a result due in good part to an improved system generally, as well as in the use of improved machinery, particularly the drill, which is a great institution itself. Week before last the total length of tunnel was 830 feet, and each week adds from 43 to 50 feet to its length. This tunnel constitutes the 1000 level, and in about 250 further, will reach the vertical line and point of connection with the shaft. At the time mentioned the shaft was down a little over 900 feet. Within four or five weeks, according to indications in both tunnel and shaft, especially the former, we may look for important developments in the Modock.

MONO.

BODIE DISTRICT.—Bodie *Standard*, Jan. 18: The work of development has advanced steadily and favorably the past week. The late rich strike in the Standard mine is turning out all that was expected. A good ore find has been made in the Tioga. In the Syndicate, Blackhawk, Dudley, Red Cloud, Noonday and Goodshaw the prospect improves daily.

BODIE.—The new shaft is now down 349 feet, which is 42 feet below the second station. The second level is being advanced rapidly, and connection will be made with the old works in a short time. The south drift is in 350 feet. The ledge in the face is looking well. The drifts north and south at the bottom of the Bruce winze are each being advanced, and the ledge is as large as ever in both directions. Ore of a very rich quality is being taken from these drifts. The usual quantity of ore is being shipped to the Syndicate mill, and it is probable that the shipment of bullion this month will considerably exceed that of last month.

AURORA TUNNEL.—The shaft on the Silas B. Smith ground is down 170 feet. The last 30 feet has been in an entire change of ground, having passed through the blue rock characteristic of the west side of Silver hill. The bottom is now in a most favorable vein formation, being full of seams of quartz. The Smith location is the oldest on Silver hill; and the course of the rich ledges in the Bodie mine indicates that they pass through this ground, and it is believed that the south extension of the rich veins mentioned, as yet undiscovered, will be found in the Silas B. Smith. Crosscutting will be commenced at a depth of 200 feet.

BULWER.—There has been no change worthy of note in the mine during the past week. The ledge in the south drift is 18 inches wide, and looks very well. The ledge in the upraise is two feet wide, and the ore at this point is very rich. The Stonewall ledge is looking as well as usual. There are now at the Bodie mill 700 tons of ore.

GOODSHAW.—The shaft is now down 410 feet. The formation in the bottom is porphyry mixed with stringers of quartz, and the indications are considered favorable. At a depth of 500 feet crosscutting will be commenced. The machinery works well.

MONO.—In consequence of the great increase in the flow of water, it has been very difficult to work in the bottom of the shaft. The station timbers at 400 feet have been put in, and one set below. Will commence opening the station immediately.

BODIE TUNNEL.—The tunnel is now in over 700 feet. The face of the tunnel is still in a favorable formation, and ventilation continues good.

NEVADA.

MILTON M. CO.—*Transcript*, Jan. 19: We are in receipt of the annual report of the Milton M. & W. Co., for the year ending Oct. 31st, 1878. The net receipts were as follows:

French Corral mine	$225,231
Manzanita mine	81,730
Water sales	51,085
Rebate on powder	2,500
Sales 322 shares of capital stock	32,200
Miscellaneous	6,484
Total net receipts	$399,230

Nine dividends were paid during the year, amounting to $21.50 per share, the same aggregating $270,748. The remainder of the proceeds was applied to the reduction of the outstanding indebtedness, construction, etc. In December, 1877, the debt due on demand was $350,000. Of that amount, $300,000 was funded on the 1st of January, 1878, in 300 bonds of $1,000 each, bearing 9% interest, of which 50 are to be taken up each year, commencing January 1st, 1880. The gross yield of the French Corral mine for the past fiscal year was $363,976, and of the Manzanita mine $173,784, both amounts representing gold. Nothing has been done at the mines since October, 1878, for want of water.

PLEASANT VALLEY MINES.—The Badger Flat Hydraulic M. Co., near Novey's ranch, have had five men at work fitting up for the rains, and are now all ready. Free water from the ravine is used, it being conveyed by 2,000 feet of 11-inch pipe, and having 136 feet fall. The claim has been worked by the present owners for three years past, last year working off a piece of ground 128x12 feet, which cleaned up $4,000. The bank is about 20 feet high, and the pay dirt is from five to six feet deep. As soon as water can be obtained the mine will be started with full force. The Nigger Creek hydraulic mine, which has been worked the past four or five years by the same owners, giving employment to a number of men, is in good shape for the rainy season. It is located about one mile south of the Hudson mine, and has a supply of free water to rely on. The pipe is 11-inch, and something like 300 feet long. The fall is nearly 75 feet. There is a small hank, but the pay streak is thought to be deeper than the Badger Flat Co's. Nine thousand dollars is reported to have been taken out here last year.

THE HUDSON MINE.—Supt. Skiff Murchie was in town yesterday. He says the snow is rapidly disappearing from the locality of the Hudson mine. Everything is working smoothly at the mine, with the exception that the water in the ditches freezes up and the mill can only be run half of the time. The ledge continues its usual favorable showing. The Boston Co. have just got through cleaning up. The result is reported to be very satisfactory. There is no water in any of the ditches, the frost and snow shutting off all the supply.

MINES SHUTTING DOWN.—The continued cold weather is having the tendency to interrupt operations at some of the largest quartz mines in this district. The main trouble experienced is from the freezing up of water ditches connected with the batteries. At the Murchie more or less delay has been met with from this cause. The Wyoming shut down last week. Thursday the Providence and Merrifield followed suit. A large number of men are thus temporarily thrown out of employment.

PLACER.

COLLINS' HILL QUARTZ LEAD.—*Herald*, Jan. 18: During the last of 1878, a party of 21 men from Portland, Maine, came to California. They brought with them an invention for saving fine gold from either sand or gravel. Five gentlemen of the company are now stopping in Auburn, while other members have gone to other parts of the State. They are stalwart and practical men, of precisely the kind and class who are needed to help the unbounded resources of the Golden State. There is room everywhere for such men. Immediately on their arrival here, the five new-comers commenced to prospect; and, it gives us pleasure to record the fact that they have uncovered a quartz ledge on Collins' hill, above the slaughter house, outside the boundary of Mr. Collins' ranch, over which the people of Auburn have tramped for the last 20 years. On Tuesday last the company pulverized a few pounds of their quartz in a hand mortar, and they obtained a splendid prospect. They are now vigorously at work, going down on their ledge.

OPHIR ITEMS.—The St. Patrick mill will be again running on the 25th, when the whole gang of 24 men recently discharged will again be put to work. Extra hands are already being put to work in the shaft. Mr. Shurtleff, of the Duncan Hill mine, has 50 tons of rock at Pugh's mill ready for crushing, which is expected to yield good pay. The extension of the old Crater mine is about to be re-opened. A good deal of prospecting is going on among the old claims, and if sufficient water he had, Ophir will soon be one of the liveliest mining camps in the county.

SHASTA.

COPPER CITY.—*Independent*, Jan. 16: W. B. Crane made a test at smelting some copper ore last Wednesday, and the result was very satisfactory; and Mr. Crane will soon be turning out copper in large quantities, as the new smelter when completed will be of 20 tons capacity per day. Superintendent Charles Dunn is pushing work as fast as possible, with a good crew both day and night, in his new tunnel on the Northern Light. The bullion shipped from the Extra Co.'s mill the past week, has been much higher in gold than the average of the bullion heretofore shipped, two of the bricks containing about $1,200 each; and being pro-

Continued on page 60.

Mines and Works of Almaden.—No. 19.

FOURTH PART.

Administration and History of the Mines and Works.

Translated for the PRESS from "ANNALES DES MINES."

II. History.

The Arahic etymology of the word Almaden (the mine) would give reason for the belief that the discovery of the mines of mercury in that region was not anterior to the conquest of Spain by the Moors. But tradition attrihutes to them a much more remote origin, aud puts hack the time of their first exploitation as far as the Phœnicians. It is at any rate ecrtain that the Romans knew of them. Theophrastes (522 B. C.,) affirms that they employed and held in high esteem the firm and fine grained cinnabar which came from Spain; and Pliny recouuts that this cinnahar came from the country called Sizaponensis. Other historians, naturalists and geographers state that of all the mines of ciunabar known to the ancients the most famous was that of the country of Sizaponensis—(Almaden). It was appreciated to the highest degree for the purity of its cinnabar, which made it unique from this point of view in all the Roman empire. It is known that they transported cinnahar from Almaden to Rome under the name of *stone-metal*, in chests (well made), and that each voyage they carried away 10,000 pounds.

They ignore, indeed, the exact use to which the ore was put; and there is every reason to believe that the applications were less numerous than they are to-day. It is certain, however, that they purified it, by a sort of mechauical preparation, no douht, and tbat it was at times used by painters, and hy the Roman ladies for the same purpose. Pliny says, however, that they hurned it and washed it, whicb seems to indicate that they extracted the mercury from it.

The hahit of adulterating it with minium from Spain (from Carthageuia and from Linares, probably) shows tbat from this period it was an article of merchandise of high value.

The word Sizaphoue, generally employed in the ancient chronicles to designate the region where Almaden is found to-day, leaves not a douht whence the Romans obtained their cinnahar. They have also discovered in the old works numerous antique remains, and particularly a great numher of Roman coins.

But the exploitation of the mines of Almaden did not hegin to be developed until the discovery of America had opened to their product a large tield for the treatment of silver ores. Previous to this the mines of Almaden, following the vicissitudes of the country in which they were, changed their proprietorship several times, either owing to conquests or as the consequence of royal gifts. Thus, in 1161, king Alphonse VIII. granted to Count Nuno, and the Chevaliers of Calatrava, the towns and the mines of Chillon and of Almaden. In the 14th century the mines paid a tithe to the Archbishop of Toledo. From 1499 to 1512 it was again the royal treasury which exploited them ou its own account.

The annual production at this epoch was not more than 23,000 kilograms of mercury. Then the treasury, emharrassed hy several dehts which it had contracted to the German hankers Fugger, decided to ahandon to them, in 1525, the ownership of Santiago, Calatrava, Alcantara and the pasturage and mines of Almaden, for three years. But at the expiration of this term, the contract was renewed and the mines remained in the hands of the Fuggers or Fucares until 1563. At this last date they had entire charge of the exploitation, for which they furnished to the treasury annually a quantity of mercury which varied from 46 to 200 tons. The situation remained the same until 1624.

It is not known exactly what was the product of the mines during the first 38 years (1525–1563) of the administration of the Fuggers; in the 61 other years (1562–1624) the average annual product was 140 tons of mercury.

In 1625 the Fugger contract was prolonged for 20 years, with the ohligation of furnishing each year to the treasury at Saville 184 tons of mercury and 6,900 kilograms of vermilion.

In 1646 the treasury resumed the exploitation on its own account (Real Hacienda), with an administrator who had the same jurisdiction as the Counts Fugger, who was placed under the direction of the Council of Finance.

Later, from October, 1708, to January, 1717, it was under a special council *la Junta de Azogues;* then from 1717 to 1735 the council or *Junta de India*. In 1735, hy decree of Don Jose Coruego y Ybarra, there was established a trihunal called "General superintendence of mercury," to which was given the decision of all questions relative to the mines of Almaden.

The "superintendence" retained these prerogatives during more than a century, till 1845; it then lost these general and judiciary powers, and only retained the administrative, which the superintendeut still exercises at the present day.

The collection of documents helonging to the mines of Almaden gives some details of the exploitation of the mines of Almaden sinoe the end of tho 15th century.

In the manner of the Romans, who, in Spain, generally employed a series of vertical cuts or shafts, at small distances from each other; during this period numerous excavations were made which were known under the names, San Sebastian, Mineta Alta, Mineta Baja, Furriaga, Contramina, Antigua, Mina Del Pozo, etc., rather hadly arranged and seeming to he placed in the vicinity of the shaft at preseut existing, the San Aquilino.

The old mine of Pozo, ahandoned hetween 1590 and 1615, had arrived, they said, at a depth of 209 meters; at this level it finished hy heing no longer exploitable, on account of the increase of the expense, and of the difficulties of drainage and of supporting. It is even helieved that the works attained, in certain points, a depth of 250 meters, and a length of 500 meters.

On leaving the old mine, they directed themselves towards the actual mine of Pozo (they call hy this name the western part of the veins of Almaden and particularly the veins of San Pedro y San Diego.)

In Septemher, 1697, they discovered specimens of cinnahar in a house near *Castillo del Retamar*, at the upper part of the town of Almaden; in the same year a shaft called the San Antonio, was opened here, and massive ore was found there, toward the end of 1698. This part has received the name of *mine del Castillo*.

They commenced in 1703, the crosscuts of the first level, called *socavon del Castillo;* at 207 meters from its heginning, they came across the shaft San Antonio, in 1706.

At this period they employed slaves for draining the mine hy hand; the supporting was all accomplished hy timhering. In 1755 a fire took place in the mine, the wood hurned during 30 months; this caused great trouhle, and gave rise to numerous accidents; finally the mine was flooded, and its future seriously compromised. Some engineers were then called from Germany, who succeeded in getting things nearly into condition again towards 1760. In 1791, the steam eugine of Watt, of which we have previously spoken, was estahlished for drainage, and this in 1873, was still the only steam engine at Almaden.

Towards 1800, the engiueer of the mines, Don Diego Larranaga, proposed and adopted the present method of exploitation. The works at that epoch, in 1803, attained a depth of 200 meters. It is evident then, that in 73 years tbey have descended only ahout 90 meters, and certainly they have furnished a considerahle quantity of mercury, as is seen in tbe following table, with which we finish this work:

The Amounts of Mercury Furnished by the Mines of Almaden from 1564 to 1875.

Years.	Weight in tons.
1564-1625	8,083.282
1625-1645	3,680.000
1646-1651	757.364
1652-1653	190.099
1653-1655	405.402
1655-1656	54.513
1656-1665	724.988
1665-1668	330.071
1668-1672	465.124
1672-1673	188.410
1673-1677	458.254
1677-1680	255.603
1680-1682	200.807
1682-1685	123.132
1685-1689	302.554
1689-1696	587.646
1696-1700	363.381
Total from 1564 to 1700	17,863.720
Or on an average per year	130.391

Years.	Weight in tons.
1790-1709	1,995.848
1709-1726	3,689.124
1726-1729	nothing.
1729-1734	1,707.617
1736-1742	1,562.289
1742-1743	417.623
1743-1749	2,629.532
1750-1757	2,305.018
1757-1773	7,299.182
1774-1781	6,365.036
1781-1786	2,966.000
1787-1789	1,641.327
1789-1798	7,727.085
1798-1799	999.483
1799-1800	844.331
Total from 1700 to 1800	42,149.501
Or on an average per	421.495

Years.	Weight in tons.
1800-1805	3,129.953
1805-1810	2,548.825
1810-1815	1,753.275
1815-1820	3,497.708
1820-1825	3,527.247
1825-1830	4,448.900
1830-1835	5,774.697
1835-1840	4,873.580
1840-1845	4,596.480
1845-1850	4,433.981
1850-1855	3,503.031
1855-1860	3,798.371
1860-1865	4,179.269
1865-1870	5,387.322
1870-1875	5,714.640
Total from 1800 to 1875	60,106.379
Or on an average per year	802.218

The production during the three centuries has been, in resume:

From.	Tons.
1564-1700	17,867.320
1700-1800	42,149.501
1809-1875	60,166.370
Total	120,179.600

When we attempt to determine the value of this enormous quantity of mercury we find it rather difficult to estimate. The price of mercury reached 12 to 15 francs per kilogram before the discovery of the mines of California—New Almaden and others. At 12 francs per kilogram, the value oreated would he 1,440 millions of francs. At the actual average rate, ahout 6 francs, it still represents the sum of 720 millions of francs. These figures are eloquent enough to need no other commentary.

Concluded.

The Cone-bearers, or Evergreen Trees of California.—No. 1.

[Written for the RURAL PRESS by J. G. LEMMON.]

General Description.

Few orders of plants can be named which are of more importance to man, whether in reference to furnishing food or huilding materials, than this of the conifers, included in and forming the most of the great class of *Gymnospermæ*, or naked-seeded plants. In general character they are resinous-juiced trees, mostly evergreen, cone-hearing (though often greatly modified) with needle-shaped or scale-like leaves, very easily distinguished at sight, and inhahiting the cold or temperate regions of the earth. Except our yew, which may he poisonous to horses and cattle, as is its English congener, not a species of them all is either noxious or useless. The most of them are very valuable, and among them are the most beautiful trees in the world. It is beyond the scope of these papers to present even briefly the various uses and values derived from the piue, spruce, fir, cedar, cypress, and juniper families of our forests. They contribute three-fourths of the material for our houses, mines, hridges, roads, wharves, vessels, etc., and the Ahorigines, especially of the Southern hemisphere, depend largely upon their fruits for food.

Habitat or Locality.

Found almost exclusively in the cold regions of the earth, the cone-hearers form necessarily two great zones across the extreme land surface —one at the north and the other at the south. In these zones the conifers outnumher the other trees of the broad-leaved, non-resinous class (as oak, ash, etc.), ten to one. Great disparity is found between the trees of these extreme regions; those of Australia, New Zealand and South America can scarcely he recognized as relatives of the more ahundant and typical trees of Northern America, Europe and Asia. Some entire genera and one large suh-order, very numerous in the northern, are entirely absent from the southern zone, though in the southern regions there are found a great many genera and hut few species.

Again, the two continents have widely different forms, amounting often to generic distinctions, and very frequently to difference of species. All the drear northern regions of Asia and the more humid northern portions of Europe are forested with this class of plants. Immense forests of pine and spruce ahound in northern Russia and in the Scandinavian peninsula. These noble forests extend down as far as Germany and Switzerlaud, hut below this locality the evergreens are outnumhered by the broad, deciduous-leaved trees, oak, ash, becch, etc.

In the northern part of North America exist the most extensive and nohlest pine forests of the globe; heing often, as in the eastern United States, 300 to 500 miles in extent. The American conifers, though possessing many species peculiar to the region, are destitute of 25 entire genera of Asiatic and Australian species.

Here on this continent are found, also, wide distinctions in respect of character hetween the two coasts, Atlantic and Pacific; species of each coast being generally confined to each. There is one notahle genus of two monster species that inhabits exclusively this Pacific region—the coast redwood and our famous Sierra "hig tree."

The last climatic, or rather regional effects to be noticed are found hy comparison of our two mountain ranges—the Coast and the Sierra. In the lower, fog-fostered Coast Range is found the redwood; while in certain groves of the inland, lofty Sierra Nevada, tower up the grand, columnar kings of the vegetahle worlds.

Wide differences in species (termed *varieties*) are detected by comparison between trees of the two ends of these ranges. The Douglas spruce, of the Oregon coast, with its large trunk and small cones, two inches long, hecomes in San Bernardino, a poor deformed tree, with enormous cones one foot long. The red fir of the Oregon Cascade Range, with its medium cones having exserted hracts, becomes (according to Prof. Brewer and John Muir, hut not Englemann) in the high Sierra the large coned fir with concealed hracts.

Class Characters.

This great class of cone-bearers, called scientifically *Gymnospermæ*, or naked-seeded plants, *i. e.*, plants with seeds not enclosed in a pericarp, hut lying naked at the hase of the scales of a strohile or coue, is the last grand division of the phœnogamous plants, and comes next to the endogens or inside-growers, with which it shares the character of (chiefly) parallel-veined leaves.

The other class characters are resinous juice, mostly more than two cotyledons or parts to the seed, pitted cells in the wood fiher (detected only with a strong magnifier) and the ahsence of ducts. The latter fact accounts for the resistance to decay generally presented hy conifer trees; hut fir trees form a remarkahle exception, rotting as soon almost as poplar. The flowers are always imperfect and *diclinous* of both descriptions, *i. e., monœcious*, with the male and female flowers on different hranches of the same tree; or *'dioecious, i. e.*, with male flowers on one tree and female on another. The fruit is a strohile or cone (*e. g.*, the pines, spruce, etc.), sometimes reduced to a cup (*e. g.*, the yew), and even to a closed, herry-like ohject, called a *galbulus*, (*e. g.*, juniper). The leaves are mostly long and slender, as in the pines, sometimes reduced to pointed scales, as in the cypress family.

Obscurity of the Gymnospermæ.

Except the greatly modified family of orchids, no class of plants is more studied and is less understood than the *Gymnosperms*. Their mixed characters, resembling the great classes on each side of them, and the extreme modification of organs, hut more than all the few or poor specimens collected of such an unwieldy class of plants, have reudered research formidable to most scholars and mostly fruitless, except by a few specially qualified scientists, of whom mention may he made of Tournefort, Link, DeCaisne, Lindley, Endlicher, Hooker, hoth father and son, Torrey, Gray and Engelmann.

Even unscientific observers often speak of the resemhlance hetween the flat, expanded limhs of fir trees and the usual forms of the stems or fronds of ferns. This resemblance also led the master of hotanical science, Linnæus, to erroneously classify them together. Their resemblance to the palms is also very marked. Both form generally a single stem. All the leaves of the palm die and fall away as the stem arises; so the side limbs of the conifers generally hecome dwarfed or fall off as the tall, straight shaft towers heavenward. The leaves, mostly in fascicles or hundles (*e. g.*, pine, tamarack), are regarded as ahortive shoots. They are usually persistent (deciduous in tamarack), remaining on the tree from 4 to 12 years.

(To be Continued.)

THE ENGINEER.

Is the East River Bridge a Failure?

Notwithstanding an expenditure of nearly $13,500,000, says *Every Saturday*, the great East River hridge hetween Brooklyn and New York will undouhtedly be ahandoned. Mr. William H. Wehb, an engineer, states that the hridge is wholly incapacitated to facilitate either passengers or husiness traffic; that it is insecure aud cannot withstand the violent storms it will he subject to; that it will not bear the enormous weights that may be expected; and that the cost and delay in taking down and reulacing the top masts of vessels necessary to all that pass uuder the hridge, cannot be tolerated. It is rather late in the day to find this out, hut Mr. Wehb says that it is only an experimental hridge. It is the highest and longest in the world, and prohahly the only one entirely unsupported hy any form of stays. The history of suspension hridges in this country and in Europe shows their most dangerous exposure to he that to storms, producing oscillations and ruptures. In view of these ohjections Mr. Webb insists that it would he foolish, if not wicked, to spend more money on a "hridge that is not called for, cannot he made to answer the purposes for which it was profcssedly huilt, very seriously damages a large part of the commerce of the harhor, taxes the financial ahility of these two cities to their utmost, and cannot fail either to he taken down hy the mandate of the courts or demolished hy the winds."

Opinion of Another Engineer.

S. B. Driggs, the well-known engineer, says: "It appears to me an unfortunate coincidence that the persons who made the original estimates were the contractors for constructing the hridge under the municipal authorities, politicians and others who sanctioned it. The engineering skill which huilt the hridge over Niagara Falls, as well as many others, with such entire success, had in the Niagara case only to provide for a span of 750 feet, which I helieve is the largest that heretofore has ever heen attempted. In the Brooklyn hridge the span is, at least, 1,600 feet. Now, mark; the deflection of the cahles at Niagara Falls is more than douhle that, which, with the present hight of towers, it is possihle to give to the Brooklyn hridge cahles, and avoid interference with navigation even in a minor degree. To me it seems that the puhlic mind, in the first place, was greatly influenced hy the connection of eminent engineers with the scheme, men of whom it may he said that to attempt was to accomplish. But when they permit their names to he used as a cover for a fraudulent scheme, it is the duty of any and every intelligent and practical man to call attention to the extraordinary departure which has heen made from well-known mathematical rules, as in the attempt to span the East river.

"As I said hefore, the distance hetween the two supports for sustaining the hridge is a little over 1,600 feet, hy far the longest span ever yet attempted, and therefore the deflection of the cahles should be proportionate to the increased length of the span. Instead of this, in order to prevent lateral or swinging motion—as there can he no side stays—the supporting cahles have heeu drawn taut. This will accomplish to a degree what is required, hut at what cost? Simply at the extent of their vertical sustaining capacity, which is largely wasted in longitudinal tension, for the douhle purpose of allowing such an inverted arch to he constructed at a sufficient hight ahove water, and to make the supports as rigid as possihle.

The Towers will not Support the Weight.

"This leads me to remark that the periphery of an inverted arch must have the sustaining power of all that it is to support in its inverted condition. For it is well known that the principle of the arch must have its ends or ahutments secured immovably, in order that the

necessary sustaining powers be obtained; but, when the arc of the arch is so flat that the sustaining power is almost wholly thrown upon the abutments, it is almost impossible for the ends to bear the weight brought upon them through the necessary powerful leverage. Now, the question is purely mathematical, and therefore capable of demonstration, and viewed from a scientific point, it is evident that the decrease of every foot of deflection increases in corresponding ratio the force of weight that the supporting columns have to sustain; and thus the want of even 15 or 20 feet of necessary deflection represents many hundred tons of strain additional upon a cable, to increase the segment of the cradle which it should naturally have. Hence every large portion of cohesive power of the metal forming such cables is expended on what I cannot help calling impracticable tension. Thus I consider that it is quite hypothetical whether a bridge built on the principle of the Brooklyn affair would be safe, and this being so, I think it would be unwise to attempt its passage. The only way to make the best of a bad bargain is to have a center pier erected. This would be far less in the way than the present cables, and it should be built higher than the side supports. On this the cables could rest, and at the same time they would be stayed, while the weight would be so divided that no disproportionate strain would be brought upon either of them. Trains and carriages, as well as foot passengers, might then make use of it, and it might—I won't say would—prove profitable."

Determination of the Resistance Offered to Ships.

In an article contributed to the *Revista Maritima*, Signor A. Lettieri has described an apparatus for the determination of the resistance offered to ships by experiments on their models. In experiments of this nature, the elements to be determined are two—the uniform velocity and the resistance encountered at that velocity. The first of these is obtained by the measure of the space passed through in a unit of time. It is, therefore, desirable to have an apparatus which shall graphically denote this velocity by a curve, and refer it to a measure of the resistance. To effect this, Signor Lettieri has designed a vertical cylinder (the drawing shows the length to be 14 times the diameter, but neither scale nor dimensions are given), which revolves on a fixed axis. The upper part of this axis sustains a pulley, and a second pulley is fixed beneath the cylinder, with a small drum on its axis. A line attached to the drum passes over the upper pulley and sustains a scale pan, to which is fixed a pencil, the point of which presses against the cylinder. The model is attached by a line to the lower pulley, so that the descent of the weight corresponds to the movement of the model through the water, while the weight itself is a measure of the resistance. Movement is given to the vertical cylinder by means of a pair of conically-toothed wheels, one of which is attached to the cylinder itself. The motion of the latter being made thus uniform, and its velocity known, the curve traced on it by the pencil will indicate the relation between the movement of the model and that of the cylinder, and will form a regular spiral when both movements are uniform. The remainder of the paper is occupied by an algebraical investigation of the curves thus to be obtained, and by the relation between the weight placed in the scale pan and the resistance encountered by the model in its passage through the water.

An Improved Hoisting Plant.—Fr. Koepe, of the Hanover coal mine, at Bochum, Germany, is the inventor of an improved hoisting plant for mines, founded upon the happy thought of replacing the two hoisting drums with its two separate ropes by a single sheave with one wire. The circumference of this sheave, which is much cheaper than the ordinary hoisting drums, is provided with a wedge-shaped groove lined with wood or leather. The weight of the two hoisting cages above will suffice to prevent slipping. The machine may either be placed directly above the shaft or it may be put up beside it. By the arrangement cited, one-half of the length of rope is saved and any overwinding becomes impossible, because when one cage is at the pit's mouth, the second rests upon the bottom of the shaft, and any further winding would tend to make the rope in the shaft slack, which the counter-weight of the cage rapidly puts an end to. If a rope is attached to the bottoms of the two cages and run over a pulley at the bottom of the shaft, complete counterbalancing of the weight of the rope is effected.

The Maryland Ship Canal.—The Baltimore *Sun* has the following in regard to the ship canal across Maryland and Delaware: The lower routes seem more practicable, and probably the route commencing at the mouth of the Choptank is the most practicable of all. The temperature being higher, there is probably no danger from ice, and the Nanticoke river and Broadkill creek can be utilized so as to materially lessen the excavating. It is some distance down the bay, but comes out at Lewes, the most desirable point for the Delaware terminus, and its situation down the Chesapeake gives increased advantages to Norfolk, the Washington and other Potomac trade and steamers, the Patuxent, Rappahannock, etc., and offers to all those parts more direct communication with Philadelphia, New York, and the general outside world.

Useful Information.

Foreign Horseshoes.—Mr. Alfred Longsdon, of Queen Victoria street, writes to the *Times*: The exhibition in the streets of London of horses slipping and falling in all directions is pitiable indeed, and many of them must be seriously strained and otherwise injured. This can be so easily prevented that it is a mystery why it should not be done, especially in England, where all in reference to the horse is supposed to be so well understood. I have just returned from Germany, and during the last fortnight the roads there have been far worse than here, yet I have driven over them with as much safety and comfort as over a newly-graveled road. The means used are very simple, and far preferable to the English system of roughing, which always renders it dangerous to the horses in stable. In Germany the smith, when finishing the shoe, punches a hole in the two ends, and when the shoe is cold he taps in a screw thread and screws into the shoe, when on the horse's foot, a sharp pointed stud of an inch in length; and with shoes thus fitted the horse can travel securely over the worst possible road, and I have never known one slip either when riding or driving; and draft horses are shod in the same way. When the horse comes to stable the groom unscrews the pointed stud and screws in a button, so that no damage can happen to the horse and the screw holes are prevented from filling. When the horse is going out the groom simply takes out the button and screws in the pointed stud, and there is no fear of the horse coming back with broken knees or strained sinews, and the public are spared the painful sight of horses down or slipping in all directions.

The Advantage of Machine Tools.—For machine tools there should be a growing demand, in exact proportion as the competition of foreign manufactures is disagreeably experienced. These tools have enabled our workers in metals to accomplish the great things which, in steam machinery, have distinguished the present generation; they have, indeed, enabled the manufacturers in whatever line of business, to largely dispense with the tiny tool wielded by the comparatively unskilled workman. We direct attention to the sphere which is widening out before those machine firms who are adepts in devising apparatus to cheapen the manufacture of domestic metal wares. The hardware makers will be growing customers to the mechanical engineer. The former will be utterly unable, by hand-made products, to continue to compete with foreigners who use machinery. The machine-made goods will still continue to run down prices, and it may be attempted to meet the competition by a reduction in the remuneration paid for manual labor. But already there are indications that pretty much the limit of endurance by handcraftsmen has been reached. Our work people have not abandoned all opposition to machinery, but it is every year less displayed. If the manufacturer of locks and files, and nails, are now customers to steel-tool making firms, the manufacturers of cutlery and kindred goods must begin to seek the help of mechanical engineers, if they are not to be jostled out of the many markets in which they have done profitable business.—*The Engineer.*

Improved Method of Managing Steam-Boiler Fires.—When the furnace-door of a steam-boiler is opened, there should be a simultaneous partial closing of the damper to prevent sudden chilling of the boiler and flues. To accomplish this, with certainty, for every opening of the doors, Mr. William Weightman, of Powere & Weightman, has had arranged and applied a system of levers and rods, connecting the furnace-doors with the damper, so contrived that whether there be one or more doors to one furnace, or to which one damper is supplied, the act of opening any one door will invariably close the damper. Whether this application of simple and ingenious devices is new or not, every engineer will regard it as one of the good things for aiding the better management of steam-boilers.

Milk in Thunderstorms.—In Erzgebirge, in Saxony, where the cold water system is carried out in large dairies, an apparently effectual plan has been hit upon for preventing the milk "turning" suddenly in tempestuous weather. A thin iron wire chain is passed through the milk-pans, the ends of which are kept constantly in the cold water. Dr. Fleischman, of Baden, testifies to the practicability of this method, for, he observes, authorities on the subject maintain that milk is less sensitive to the electricity of the air than to the temperature that surrounds it more immediately. The fact that milk kept in enamelled or tinned vessels is less liable to turn sour in hot weather speaks well for this new theory.

An Artificial Tallow.—A patent for artificial tallow was issued in October last to Senor Miguel de la Vega, of New York. The inventor states in his patent, that 100 lbs. of the tallow is produced by mixing together 60 lbs. of castor oil, 10 lbs. of animal tallow, 10 lbs. of vegetable oil, and 20 lbs. of wheat flour. These ingredients are boiled together for about 30 minutes by steam heat. When the mixture cools it hardens, and resembles tallow. Cotton seed oil, or any other similar vegetable oil will answer the purpose equally as well as castor oil.

Compressing the Bulk of Flour.—A French chemist some few years ago conceived the idea that it would be practicable to compress flour so as to diminish the bulk and yet not injure its quality. An experiment was accordingly made. Flour subjected to a hydraulic pressure of 360 tons was reduced in volume more than 24%. On close examination it was found to possess all the qualities it had, previously to its violent treatment. It was then put into zinc boxes and sealed up. At the same time other flour manufactured from the same wheat, but not compressed, was sealed up. About three months after several, boxes containing both kinds of flour were opened and examined. The pressed was pronounced to be the best. Twelve months after this, another examination took place, and with the same result. The two kinds were kneaded into loaves and baked. The pressed flour made the best bread. In another year the boxes were opened and examined, and while the loose flour showed moldiness, the pressed was sweet, and retained all its qualities. Made into bread the same difference was observable.

Indelible Ink for Zinc Labels.—A correspondent of the London *Garden* says: "Many years ago a friend gave me a simple recipe for ink for writing on zinc, which I have constantly used since. It is 72 to 16 grains bichloride of platinum dissolved in one ounce distilled water. If kept corked a small bottle will last many years. The zinc labels must of course be cleaned before using. This is readily done by rubbing, either with fine emery paper or with very dilute oil of vitriol. Then simply write the name and allow the ink to dry. I have used labels of this description for years, and have never lost a name since adopting them. They have been found equally suitable for the house or the open air."

Good Health.

Is Fat Injurious?

Fats are very important elements of our food; still, goose oil, lard, tallow, train oil, fish oil, and such varieties of diet, are wisely eschewed by all except lumbermen, and those whose physical labor is very great, and who are almost constantly exposed to cold. While, therefore, the student and civilized worker wisely eschews the coarser forms of fat, he should not ignore it in some more refined and delicate form. He should instead use such as are most suitable to his taste and needs. The brain is a great consumer of fat, combined with phosphorus. No phosphorus—no thought, is a modern phrase, expressing the importance of phosphorus in mental action. As yet we are in the infancy of knowledge on this subject, but it may be predicted that when we know the whole truth, the phrase will be something like this: "No phosphorized fat, no thought." There is always some fat in most of our foods. The special forms best to make up any deficiency that may be in them are no doubt to be found in good butter and cream. There are, of course, instances in which they will not be tolerated, but these are exceptions. Fat is not digested in the stomach, but by the pancreatic juice in the intestines, nature having provided a special juice to form it into an emulsion so it may be absorbed. In this state every atom of fat is so small that it requires a microscope to detect it, and in this state it may easily be passed through the walls of the intestines and carried into the circulation. We need no better evidence of the need of fat than this careful provision for its digestion in the system. The symptoms which attend a non-use of fats in some form are coldness of the extremities, a tendency to indigestion, lack of nervous energy and power to think. Emaciation, diminished muscular power, and a tendency to consumption.

It may be true that many persons suffer from an inability to digest fats, and that sometimes they obstruct the liver and make much trouble. In all such cases it would be advisable to use them wisely and judiciously, but rarely to avoid them altogether, except, perhaps, in corpulence, where they are best used in great moderation. Lean people should use fats rather more freely than fat ones. The amount of fat necessary for a healthy working person is about three ounces daily. Persons with extraordinary working power require more than this. The starch in our food is to a certain extent a substitute for fat, and may be converted into it.—*"Eating for Strength."*

The Lesson of a Sneeze.—As a rule, a sneeze is the warning nature gives that some part of the body is exposed to a cooler temperature than the other parts, that the sneezer is "catching cold." Next to the warning, what is the use of a sneeze? It throws open the pores of the whole body, and induces a gentle perspiration; in a word, it throws out the cold. A child rarely sneezes more than twice. Perspiration is readily induced in a youth; an old man, on the contrary, sneezes half-a-dozen to a dozen times with a loud "catchogue." It is harder to set him perspiring. When one is sitting by an open window, and finds himself sneezing, nature tells him he is taking cold. He should get up instantly, walk about, and take a full tumbler of cold water to keep up gentle perspiration that the sneeze set in motion. If he does this, he will not be telling, an hour after, that he has a "cold in his head," or chest, or lungs. —*Eastern Gazette.*

Keep Your Nails Clean.

People differ much in their nail habits. As an observer well remarks in the *Phrenological Journal:* Some keep them long and pointed, like reminiscences of claws; others bite theirs close to the quick. Some pare and trim, and scrape and polish up to the highest point of artificial beauty; and others, carrying the doctrine of nature to the outside limit, let them grow wild; with jagged edges, broken tracts, and hangnails as the agonizing consequences.

Sometimes you see the most beautiful nails—pink, transparent, filbert-shaped, with the delicate, filmy little half-moon indicated at the base—all the conditions of beauty carried to perfection, but all rendered of no avail by dirt and slovenliness; while others are yet pleasant to look at for the care bestowed on them, their dainty perfection of cleanliness being a charm in itself.

Nothing indeed is more disgusting than dirty hands and neglected nails, as nothing gives one such a sense of freshness and care as the same members well kept. But one of the ugliest things in nails is when they are bitten, which, to judge by what one sees, is a habit having irresistible fascinations for those given over to it. It is an action, by the way, that has more than one significance. It may mean consideration, doubt, hesitancy, or it may mean anger or annoyance.

In Paris there are "manicures," who treat the hands of customers just as the chiropodist does the feet of people. It would be a profitable enterprise for some to start in America. Many persons are apparently too indolent or careless to keep their hands in a neat and proper condition.

Winter Clothing for Children.

The matter of winter clothing for children has not heretofore been a subject of much thought here on the Pacific coast; but in the midst of this exceptionally cold season the following hint may not be inappropriate: It is generally thought that a very proper article of winter clothing for children is a comforter swathed around the neck. This is a great error. The feet and wrists are the proper members to keep warm; the face and throat will harden into a healthy indifference to cold; but that muffler, exchanged for an extra pair of thick socks and knitted gloves, would preserve a boy or girl really warm and well. Bronchitis and sore throat have declined nearly 50% since the absurd use of high collars and twice round handkerchiefs went out of fashion, and if the poor would take better care of their children's feet, part of infantile mortality would disappear. It only costs a trifle to put a piece of thick felt or cork into the bottom of a boot or shoe, but the difference is often considerable between that and the doctor's bill, with perhaps the undertaker besides.

Diphtheria of late has been prevailing to an alarming extent in every county, east and west. At the last annual meeting of the American Medical Association, it was urged: 1. That, in case of diphtheria occurring in a pupil attending school, the patient should be wholly separated from other children until two or three weeks after his recovery; that those who had been specially exposed should be allowed to attend only after careful medical examination; that, where several were afflicted, the school should be closed and as many of the children as possible removed from the place. 2. That all clothing used by a diphtheritic patient should be subjected to intense heat, either of dry air or hot water. 3. That the room should be thoroughly ventilated during the patient's illness and afterwards disinfected. 4. That where the disease is prevailing as an epidemic, it would be desirable in summer to erect a large hospital tent in an airy position, whither all the patients might be at once transferred, and in winter a house might be converted into a hospital for the same purpose. 5. That we should treat diphtheria as we do scarlatina and small-pox.

Re-uniting of Pieces Separated from the Body.—Dr. Maas describes two cases in which pieces separated from the body were replaced, and had united. In both cases the nose was the portion injured, and in both the epidermis sloughed off, leaving the rete Malpighii exposed. The pieces were sewed on with fine sutures, between which strips of adhesive plaster were applied, and, over all, oiled silk or cotton batting, to prevent evaporation and maintain warmth. The two following rules are given: (1) The piece separated must be kept warmed to the temperature of the human body. (2) It must be replaced, whether with sutures or adhesive plaster, or both, directly the flow of blood ceases. The nutrition of the piece is supposed to be maintained by the speedy re-establishment of circulation through its vessels.

How to Kill a Tapeworm in an Hour.—Dr. Karl Bettelheim, of Vienna, narrates, in the *Deutsches Archiv*, a heroic method and nearly sure cure in the short space of time of three-quarters of an hour to two hours. It is this: He inserts a tube in the œsophagus, to the stomach, and pours down from 200 to 400 grammes of a very concentrated decoction of pomegranate root, having previously had his patient fast for 24 hours. The worm is stupefied, and passed, head and all, to a certainty; the patient has no sickness of the stomach, and no nauseous swallowing to do; and the drug is cheap.—*Med. and Surg. Reporter.*

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The Week.

The event of the week is the timely, widespread and soaking rain, which, commencing on Wednesday evening, has, at the time we write, been falling moderately but steadily for nearly twenty-four hours; being the most penetrating, protracted, and in every way beneficial rainfall that has yet occurred at this point the present winter. Should it continue after this fashion for another twenty-four hours, it will, through the improved prospects imparted to our leading interests, do much to change the previous feeling of despondency and gloom to one of cheerfulness and hope. While we require a great deal more rain than we have had to date, to amply supply the mines with water and make certain the cereal crops throughout the State, the gains insured by the present storm may be estimated by the million, so much at a critical period may our material prosperity be made to depend upon the fall of even a single inch of rain. Truly has it been said that much that is common to the eastern side of the continent has been reversed here in California; and in nothing has this maxim found so apt verification as through the peculiar conditions of the climate. A pleasant winter day with a clear sky and the promise of long-continued fine weather, would, on the other side, enliven business and put everybody in the best of spirits. Not so here. We dread these fine winter days. The practical business man sees in them only ruin and disaster. To the farmer they mean poor crops; to the miner, light clean-ups; to the laboring man low wages; to the merchant dull sales and slow pay; to everybody, in short, stagnant business and hard times. Give us, however, a sodden earth and leaden sky, a down-pouring rain with a good prospect of its long continuance, and business of all kinds is at once inspired with new life.

The Heat of the Comstock.

In the year 1878 the Government of the United States commenced a work which it had too long neglected, and has since dropped only half completed. That is the careful examination of the Comstock lode, the largest deposit of precious metals now known in the world, and one of the most remarkable exhibitions of the phenomena which the earth hides within its bosom. The work was done by Prof. John A. Church, of Columbus, Ohio, in connection with Wheeler's survey of the Territories. Prof. Church spent five months in the field, and as a first result of his labors, the annual report of the Chief of Engineers contains a discussion of the heat which makes labor in the Comstock so severe. It is a matter of first importance to know whether this heat is likely to increase rapidly in depth, for it has already reached a point at which it is almost unendurable.

Hitherto nothing has been known of the cause to which this heat was to be attributed, and the only explanations given were those which had obtained authority in other parts of the world. They were two in number, both referring to the fact that the rock of the Comstock region was once melted and poured out in a fluid state. According to one of these theories the erupted rock has never cooled down except near the surface. Rock does not transmit heat very readily, and when a layer a thousand feet thick has become cool it acts like a blanket to keep the remainder of the mass from losing heat.

The other theory is that a mass of melted rock, or at least very hot rock exists at a comparatively moderate depth in the Comstock neighborhood, and the heat from this intensely hot center of radiation is transmitted through the rocks of the lode, keeping them warm. The rocks there were poured out at quite a recent period, and this theory merely asserts that the original sources of the melted material are still very hot and keep the crust above them at a high temperature.

Both of these theories are old and were invented to account for the fact that regions containing eruptive rocks are often found to be the seat of hot springs, and to give other evidences of heating. The springs at Steamboat merely repeat the conditions which are found at Carlsbad, Franzenshad, and other European localities, and in Mexico; and when the Comstock first came under the observation of scientific men, one of the first points settled was that the hot springs burst out from an uncooled mass of eruptive rocks, or were the last phase of the aqueous eruptions which formed the lode. Since then nothing has been added to the facts or theories, except the assertion by Mr. King that the rock is heated by the water which penetrates it, leaving the origin of the hot water still unaccounted for.

Prof. Church rejects all of these theories and brings evidence to show that the heat of the rocks is maintained by some cause that is in action now, and cannot be considered as a remnant of a fusion long passed. He calculates, for instance, that it is impossible for rock to transmit heat with such rapidity as the propylite of the Comstock does, unless it has a very much higher temperature than anything known there.

In the Yellow Jacket mine the rock at the 2200 level was found to have an average temperature of 138° Fah., and as the increase of heat in the rocks is found to be about one degree Fahrenheit for 45½ feet of depth, the temperature of the rock on the 1732 should be about 127½° Fah. Therefore between the 2200 and 1732 levels there is a layer of rock 468 feet thick, which has its under side 10½ degrees hotter than the upper surface.

Upon these facts it is possible to base trustworthy calculations concerning the source of the heat; for a third of a century ago Prof. Forbes, Director of the Calton Hill observatory, in Edinburg, Scotland, began a series of observations on the rate of heat transmission in rocks and soils. He planted thermometers in the trap rock of the hill at depths of 3, 6, 12 and 24 feet, and the readings of the instruments have been taken patiently several times a day ever since. A few years ago they were summarised by the celebrated Sir William Thomson, and it is on the results obtained by these two gentlemen that Prof. Church bases his assertion that no possible rate of heat transmission could keep up the high temperatures found in the mines.

Sir William Thomson found that a plate of trap rock one foot square and one foot thick, would transmit in 24 hours, for each degree of difference between the top and bottom of the plate, enough heat to raise 24½ pounds of water one degree in temperature. The trap of Calton hill and propylite of the Comstock are both eruptive rocks, and it is not making a violent supposition to say that they probably transmit heat with about equal facility. Therefore the stratum between the 1732 and 2200 levels of the Yellow Jacket, having a difference of 10½ degrees between the temperature of its top and bottom, should transmit enough heat in each day to raise $24\frac{1}{2} \times 10\frac{1}{2} = 255.7$ pounds of water one degree, provided the distance between the levels were only one foot. But we have seen that it is 468 feet, and it is a known law that the rate of heat transmission diminishes with the thickness of the stratum. To obtain the amount of heat which the rock between these levels of the Yellow Jacket is actually capable of transmitting, we must divide the above quantity by 468, which will give the amount of heat the 1732 level would receive, provided it were heated entirely by transmission from the 2200 level. Dividing 255.7 by 468, we obtain 0.55 pounds of water raised one degree in temperature, and the next step necessary is to ascertain how this compares with the actual state of things.

Fortunately this can be done, and the circumstances are an excellent example of the value which the pursuit of knowledge, even of the most abstract kind, will eventually have. While the labors of Prof. Forbes and Sir Wm. Thomson have made an approximate theoretical calculation possible, the intelligent interest which Capt. T. G. Taylor, formerly Superintendent of the Yellow Jacket, took in his mine, has placed within Prof. Church's hands the means of comparing these theoretical results with the amount of heat actually transmitted to the 1732 drift. Capt. Taylor began in 1875 a series of observations at several points in the mine, and though a few of the records have been accidentally destroyed, enough remains to afford a valuable source of information.

The Yellow Jacket is opened by a vertical shaft to the 1119 level, and an incline to the 1531 level. From the 1531 two parallel winzes are sunk on the lode, inclining with it. They are 413 feet apart, and connected on every lower level by the main north and south drift. The mine is downcast, and the air current passes down the vertical shaft to the 1119 level, thence down the incline to the 1531 level, through a drift to the south winze, and thence down this winze to the 2200 level, the bottom of the mine. On its way from the 1531 it sends a current through the 1732, 1935 and 2040 levels, these currents being reunited in the north winze, which is the upcast. The north winze does not reach to the surface, and no air rises today in the mine, the entire current flowing into the Imperial and Bullion mines, both north of the Yellow Jacket, and both of them exclusively upcast. This simple arrangement, and the fact that the drifts are not worked in now, and, are therefore free from the heat of candles, men and other disturbing causes, make the Jacket one of the best mines known for observations on heat.

Capt. Taylor has placed Fahrenheit thermometers of the common kind, with japanned tin cases, at the surface, foot of the vertical shaft (1119 level), 1732 south and north winzes, 1935 north winze, and 2040 south and north winzes.

Prof. Church says that the instruments, which are of ordinary construction, should be replaced by standards, and that the favorable circumstances of the mine will repay careful work upon it. According to his measurement, the mine receives about 18,000 cubic feet of air per minute, which divides into three splits in the south winze, one of which travels through the 1732, 1934 and 2040 levels respectively. The air gains in temperature in descending the south winze, and also in passing the 413 feet of drift to the north winze. On the 1732 the amount of the gain in six months was—

HEAT OBSERVATIONS, YELLOW JACKET MINE, 1732 LEVEL, 1877.

	South Winze.	North Winze.	Gain.
January.....	75.62	86.50	10.88
February.....	76.85	83.87	7.02
March.....	76.10	88.89	12.79
April.....	77.48	88.23	10.75
May.....	81.42.	91.11	9.69
June.....	79.39	91.62	12.23
Average for six months.....			10.56

Eighteen thousand cubic feet of air, divided among three drifts, would give each one 6,000 cubic feet, or close on 400 pounds of air per minute. The amount of heat absorbed is 1,128-pound-heat units in traveling 413 feet on the 1732 level. This is equivalent to burning 216 pounds of anthracite coal in that drift each day.

A more striking way of stating the facts is by saying that if hard-coal fires were kept at distances of 100 feet in the drift, each one of them would have to burn 52½ pounds of coal daily to warm the air current as much as the drift does. There is not a household fire in San Francisco which could replace one of these hypothetical fires in the drift, unless it is in one of the largest furnaces used for warming a whole house.

By combining the heating power of the drift, as found from Capt. Taylor's observations, with the transmission proved to be theoretically possible, Prof. Church shows that the heat of the drift is at least six times what it could be by mere transmission.

He also shows that the heat of the rocks cannot come from the water, for the rock of the Comstock is mostly quite dry, and the dry rock is as hot as the wet. Finally, by the mere statement that the 1732 level of the Jacket has not lost its heating power, after two years' exposure to a cooling air current, he shows that it cannot be referred to retention of the heat by which the eruptive rocks were originally melted.

He maintains that the heat is constantly produced by some agency that is now acting in the rocks, and that the agency involved must be a chemical one.

Mrs. Josefa Livermore, wife of the late Robert Livermore, one of the oldest residents of Alameda county, died Thursday, last at Livermore. Deceased was born in the Livermore valley in 1810.

The steamship *Oberon*, from New Orleans for Liverpool, is ashore near Queenstown.

New Hoisting Machinery for the Comstock.

Prescott, Scott & Co., of the Union Iron Works, in this city, have just completed, ready for shipment to the North Consolidated Virginia mine, on the Comstock, the largest direct acting hoisting machinery yet built on this coast. It was designed by and built under the supervision of Mr. Wm. H. Patton, of the bonanza mines. This machinery, which is believed to embody all the latest improvements in this class of work, was set up at the foundry this week, and we had an opportunity of examining it.

Foundations.

The foundations which are already laid for the reception of the hoist are of massive stonework 24 feet deep, 38 feet wide and 56 feet long. In this, the foundation bolts for the frames of the engines have been set. The bolts vary from 2½ to 3 inches in diameter and are 20 feet long. For the accommodation of the brake frames, hydraulic cylinders, crank plates, reels, etc., the masonry is stopped off at the proper points, while the balance is carried up level to a horizontal plane of two feet below the bottom of the engine frames, which rest on a coping of the above thickness.

The hoisting plant consists of two engines, connected together at the main pillow blocks, by a common crank shaft, with accompanying reels, clutches, brakes, wheels, indicators, rods, levers, hydraulic cylinder, overhead sheaves, etc.

The Frames.

The engine frame is of the style known as the Corliss, about 24 feet long between the front ends of the cylinder and where the frames join the pillow blocks. The engines are placed 28 feet apart. The pistons are of 28-inch diameter and have an eight-foot stroke. The cylinders are cast separate from the frames that carry the cross heads, guides, etc., but are bolted to them. These frames are bored out to a diameter of 35 inches, for the reception of the cross heads. For convenience of shipping, these frames that join the cylinders to the pillow blocks are cast in two pieces and carefully bolted together. The pillow blocks are furnished with heavy side and bottom brasses, that are fitted for the crank shaft.

The Pistons.

The pistons carry spring packing. Both heads of cylinders project into the cylinder six inches, and are made concave to suit the piston. The back heads are heavily ribbed, and have a separate outside cover bolted on and turned and polished all over. The front heads form one end of the engine frame and are bored and fitted with separate stuffing boxes turned and bolted securely. All the glands of both engine and bottom of stuffing boxes are properly bushed with brass. The piston rods are of steel, six inches in diameter and about 14 feet long. The cross heads are of wrought iron, with brass shoes to fit circular guides of frames. They are keyed to their respective piston rods and are provided each with pins for connecting rod. These latter are of wrought iron, 10 inches in diameter at the middle and 23 feet long.

The cranks are of usual form, but carry crank plates that are cast in two pieces and bolted together, after being carefully fitted to the crank. These crank plates are carefully turned off at the rim for the brake straps, that are operated by the engineer through a series of levers, rods, etc.

Valve Motion.

The admission valves of the engine are of the Cornish pattern, nine inches in diameter. The exhaust valves are of the American double-disk pattern, driven by eccentric and combination of rock shafts, levers and cams. The expansion of steam is controlled by the Cross variable cut-off, made to adjust by levers held by quadrants. The steam and exhaust chests are cast on the cylinder, the steam chest being on top at each end and connected together by a 10-inch pipe with a branch for the throttle; the valves being directly over the steam ports. The exhaust chests are on the side of the cylinders. The steam and exhaust valves are of brass. The ends of the valve lifters are supported on turned, polished columns, bolted to flanges projecting from the steam chests and the side of the cylinder.

Both steam and exhaust valves are worked from one rock shaft placed above the cylinders equi-distant from each other. This rock shaft is four and a half inches in diameter, working in bracket boxes, bolted to the tops of cylinders. Motion is given to the rock shaft by a connecting rod, from an intermediate rock shaft, working in a box bolted to a foot, cast on the engine frame near the forward end of the guides. This rock shaft is 4 inches in diameter, and 14 feet long, fitted with brass boxes.

There is a 10-inch Corliss valve on each engine for the throttle, fitted with a pass-over valve in the side of the valve chest, and fitted with shaft, lever and quadrant, all of bright work. The pistons are 12 inches deep on the periphery, and 14 inches at the centers, both outsides being convex. The cross heads are all bright. The cross-head pins are of steel 6½ inches in diameter and 9 inches long in the bearing.

Reversing and Cut-off Gear.

The two reversing links are connected direct to a pin on the arm on the inside end of the intermediate rock shaft, and are of solid wrought

iron, 18 inchee between the centers of eccentric rod pins. The links are case-bardeued and work iu a solid wrought-iron link block with steel gibs. The liuk motion is all complete with suspending links, tumbling shafts, balance levers nnd weights, double quadrante, band lever and shafts, witb connection from lever on tumbling sheft to the hand lever. Thero are four eccentrics fitted to tbe crauk shaft, two for each engine, for working the links, and connected to the same by rods, fitted witb journals, keys aud gibs, these rods being all bright finished. There aro two separate eccentrics (one for each engine), for working the cut-off gear connected to it by rods and levers, with intermediate rock shaft. Tbere is a quadrant witb lever for adjusting and boldiug the cut-off gear in place, with connections of the same description and finish as the reversing gear.

The crank shaft is of wrought-iron turned, and a little over 27 feet long, and 18 inches in diameter. The wrought-iron cranks are four feet from conter of shaft to center of crank pin, the hubs beiug 36 inches in diameter and 17 inches thick. The balance wheels are 13 feet in diametor aud 14-inch face. Tho connecting rods are 22 feet long, 6 inches diameter at necks, and 10 inchee at centers.

Tho Reels and Brakes.

There aro two reels which turn loosely upon the shaft, and nre brought into actiou by clutchee which slide upon the shaft where it is planed off octagonally for greater strength. The reels nre six feet in diemeter where the flat ropo begins to wind upon itself, end can coil at lonst 4,000 feet of rope, making 15 feet in diameter when tho rope is wound up. The brake wheels nre attecbed to the reels nnd are turned off on the rims for friction brakes. These brakes on each reel consist of two upright wrought-iron trussed vibrating arms, 19 feet long, connected together at the top by a double-adjustable rod, and prepared to receive wooden shoes 9 feet long and 12 inches thick. There are two sets of brakes for each of the reels, one for operating at each side, and one set at the bottom of tbe brake wheels.

Tbe brakes nre operated by levers conuected to hand wheels by rack and pinion, and fnrnished with ratchet and pawl for holding brakes in place. The bottom brakes consist of wrought-iron straps with ndjustable screw ends, the brake straps being covered with hard wood. There are two brakes for the engines, one on each balance wheel, consisting of wrought-iron straps, operated through a combination of levers aud rods, hy a foot pedal. The brake wheels are 15 feet in diameter and 12-inch face.

Hydraulic Clutches.

The clutches for throwing the reele into gear, fit on the octagonal part of the shaft. They nre 29 inches long nnd with a hub turned 36 inches in diameter. These clutches are operated by hydraulic power, under control of tbe brakeman. When the pressure of water is turned on to the pistou of the hydraulic cylinders, it operates through suitable connections—a bell-crank lever which throws the clutch in or out of gear. There can never be any miss about the mechanism and no effort is required to connect or disconnect the clutches.

The Indicator Gear.

The indicator gear fitted to this hoisting machiuery is of a novel form, tbis being tbe first of tho kind in nse. It was recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by H. C. Behr, of Virginia City. As the reels on this engine operate separately, there are two indicator drums, one for each reel. Each one consists of a metal drum, fonr feet in diameter, mounted on a vertical shaft. On this drum ie a worm or spiral band of copper, mede so as to hold upon it, by epring or screw, numbers indicating positione in the ehaft. The revolution of the drnm and helix operates two screw shafts which carry an indiceting bar and pointer, said bar and pointer moving in a plane in the direction of the axis of the drum and following the helix, so as to point out the position of the cage on the end of the rope in the shaft. With the ordinary indicator it is impossible for tbe engineer to know with accuracy the position of the cage in the shaft, as the variation is so great. In this, the helix on the drum has the nnmbers upon it which indicate the certain points in the main shaft. It is marked off in feet. As the drum is rotated hy a pinion on the reel shaft actuating the drum, the pointer on the indicator bar moves vertically and the pointer indicates exactly the number of feet of rope out. The stretch of cable whcn out at great length may be calculated for and the marks or numbere changed on the helix in accordance with the stretch. The accuracy of the device is such that the engineer can tell, to a foot, exactly the position of the cage in the shaft. These drums are four feet in diameter and six feet high. The coil or helix going around it 26 times. Each turn may be marked off in 20 numbers of five feet each for 100 or 10 numbers of 10 feet each; so a whole 2,600 feet may be marked off in five-foot sections, with considerable space between. These nnmbers may be shifted at will to account for stretch of rope. On these engines there is a epur gear, secured to a follower on the brake wheel arms, to connect with a pinion keyed to the shaft carrying the worm that drives the gear on the vertical drum shnft.

Operation of the Hoist.

The engines described are bnilt to attain a maximum piston speed of 1,000 feet per minute. Thie will require about 60 revolutions of the cranks. The speed of the cages moving in the vertical shaft will vary, accordiug to the amount of rope wound npon the reels, frem 2,000 to 4,000 feet per minute. They are under tho control of a single engineer and his brakeman, the former landing the ascending cage aud the latter the descending, continually. The engineer fixes his ettention upon the indicator tbat rogisters the progress of tho ascending cage, and at the proper instant, cuts off his steam, applies his brakes to the crank plates, and stops the cage at the mouth of the shaft. Meanwhile the brakeman is lowering the other cage, watching the indicator connected with its reel. When it approaches the station he tbrewe out his clutch, by means of hydraulic power, applies his brakes and brings his cago to a stand-still. On the return run the positions are simply reversed.

Each man has, therefore, n simple duty to perform, oue nttending to tbe hoistiug and the other to the loweriug of the cages, coutinuously. By this systematic and expeditious way of working, a maximum out-put of 1,200 tons per day can ho secured.

All this machinery weighe about 400 tons, and is the largest of the class on the coast. Most of tbe large hoisting machinery here is geared, but this is direct acting. Four boilers, 54 inchee in diemeter and 16 feet long, have been shipped to accompany the machinery, these making eight boilers in all at the shaft where tbese engines are going. Each pair has donble steam drums. In the engine all the working pins throughout the valve gear are of steel, and the connections fitted with bresses, keys and gibs. All the levers, wipers, rods, rock shafts, journals, caps, connecting rods, quadrants, reversing levers, etc., are finished bright. The quadrants and levers are fitted up with spring and brass hand catches, like locomotive quadrants. All the principal eccentrics, slides, etc., are fitted with the Lonergan oilers.

Fig. 2. Section Cut "with the Grain.

The machinery altogether is very handsome in appearance, and is substantially and carefully made, reflecting credit on both designer and builders.

E. GAUGOT, the well-known mining engineer, and one of the original members of the American Institute of Mining Engineers, sailed on the steamer *Belgic* on the 21st inst., to assume the position of general superintendent and engineer of the coal mines for the Japanese government.

A Foe to the Lumberman.

Scientific investigators are continually coming to the aid of practical workers with explanations of the evils which hedge about their work and endanger its results. These explanations we seek for publication, because often a knowledgo of the evil suggests a remedy, and where this happy result deee not follow, there is still the satisfactiou of being acquainted with the occult agency which crosses the worker's pathway toward success in his nvocation. A very interesting case of timber destruction by a fungus, which penetrates the growing tree nnd honeycombs its heart without leaving any exterior marks by which the lumberman can tell the worthlessness of the timber beneath the bark, was brought to the attention of tbe California Academy of Sciences, by Dr. H. W. Harkness. As tho case is of such wide practicel interest to lumbermen and tree growers generally, we have made engravings to show tbe way in which the fungus attacks the fiber of the tree. These engravings will be fully explained in the courso of the paper which Dr. Herkness read at the Academy of Sciences, nnd which we print herewith:

During the past few years the study of the

FIG. 1. CROSS-SECTION OF CEDAR, HONEY-COMBED BY THE FUNGUS.

fungoid diseases affecting vegetation has proved to be one of much importance, not alone owing to the scientific interest attached to the subject, bnt also to the farmer as well, whose best efforts are often thwarted by the presence of a pestilence he is powerless to control. The *Peronospora*, affecting the potato, *Puccinia* and *Erysiphe* amongst wheat, are capable of destroying the fairest fields in a single night, while the *Sphæria morbosa*, npon our fruit trees, and the *Merulius* and *Polyporus*, amongst those of our forests, are but types of a large order of parasites which are eilently at work converting many of our forest trees into their original elements. In many instances it is probable that the tree has completed its growth before it is attacked, yet the external signs are so obscure as to mislead the observer, valuable trees being lost before the appearance of disease is even suspected.

A notable example in point is to be found in the Douglass spruce of our mountains; this is well known as one of our most beautiful trees, while for many purposes the timber is of great value. The lumberman suffers, however, a great loss from a form of dry rot which attacks the living trees, the presence of which disease he is often unable to detect until after much labor has been expended in preparing the lumber for market. The disease of this tree is owing to the presence of a new species of *Dædalia*, for which I propose the name, *D. vorax*, which first finds lodgment beneath some dead limb. Following the course of the limb as it enters the heart-wood of the tree, the mycelinm begins immediately to branch upward and downward along the line of the longitudinal cells. Ramifying among these it sape the cell contents and destroys the vitality of the structure. On making a section of the tree the line of devastation may he easily traced by the minute channels filled with the decaying wood. The tree once fallen, the work of the fungus does not cease, but, on the contrary, is greatly accelerated, owing to the greater amount of moisture it imbibes when in recumbent position; and hence it is that our fallen epruces so soon disappear.

But let us pass to another, the fir trees of our Sierras, for a still further proof of the work of destruction wrought upon our living trees by fungi. In the case of the fir, the fungus (with little doubt *Polyporus revolutus*—Cooke) attaches itself to the bark of tbe tree; its mycelium soou penetrates to the cambium heneath; there it epreads over a considerable space, and begine to force its way directly tbrough tbe sapwood toward the beart. Tho treo dees not, however, readily yield to tho influence of ite foe, but commences to develop new tissue, in order to arrest the extension, or partially encyst the fungus. Layer after layer of new tissue is formed, until great bulbous expnnsions are produced upon the trunk; the perasite all the while is enting its wey like a cancer, slowly but surely, into the heart, until finally, after years of centest, the tree falls a prey to its deadly cnemy. So general is this disease amongst the firs thet, as Mr. Johu Muir asserts, few, if any, die from any other cause. Thie fuugus, like the ouo before mentioned, continues its work in the fellen trees.

In the fungus I am now to speak of there ie a marked exception, however, to this rule. I allude to the fungus which is at work upon our *Libocedrus decurrens*, a tree of great velue for timber, tho consumptiou of which is constantly incrensing as its good qualities ere becoming better kuown. In some localities, as can be shown, one-half or more of the trees are diseased, aud yet no exterual signs nppear by which the lumberman may determine the diseased tree from that which is sound. The method, too, by which the fungus invades the tree is most eingularly perplexing. If we examine a transverse section of an affected tree, we shall find numerous small openings, as shown in the larger engraving (Fig. 1), and which create the impression of being the work of some animal. Frequently 50 or 60 such openings may be seen in such a section. These openings vary from one-half to one inch in diameter. A longitudinal section of such a tree reveals the fact that these openings are not continuoue throughout the body of the tree, but are eimply elliptical cavities of from three to four inches in length. These openings are shown in the smaller engraviug (Fig. 2).

These cavities are filled with the dead wood, pervaded with threade of mycelium. The wood so affected becomes contracted in the cavity, is very friable and easily powdered between the fingers; the medullary rays end fibro-vascular bundles, together with the cell structures in general, maintaining their proper relations to each other. A singular fact must in this connection he noted, which is this, that along the line of this decayed wood, or in other words, the borders of these cavities, there seems to be no partially decaying or decayed wood. Between any two such cavities there is a considerable portion of perfectly sound wood, the mycelium in some unaccountable manner, finding its way through the living wood, leaving behind not the slightest microscopic trace of its progress. The cavities always appear in the dry heert-wood, and, though I have diligently sought for them, I have never yet seen one in the sap-wood.

Under treatment with suiteble reagents, the affected wood shows abundent branching threeds of mycelium traversing the entire mass. Along with these are found a considereble number of zoospores. Thus far I have been wholly nnable to detect the presence of any germspores. There is ahundant evidence, in my judgment, however, that these spores must he sought for among the roots of the tree. Yet their discovery will depend, in a great measure, upon accident, es the germ may have developed, fruited and diseppeered a century before its mycelium had finished its work. There ie ae yet no apparent law governing the distribution of this fungus among the trees of this genus. As I em informed by Messrs. Towlee & Co., who have hed large experience with the tree, it attacks equelly well those trees which grow either in moist or in dry soil. Another striking peculiarity of this fungus, and one wherein it is an exception to those previously mentioned, is to be fonnd in the fact tbat when the tree diee its ravages cease entirely.

In the cases of fungi destroying the Douglass spruce and the fir tree of the Sierras, before mentioned, we have seen the fungus continuing its work after the deeth of the tree, and becoming the most active agent in completing its destruction. In this instance, however, if the wood is not so far honeycombed es to crush under weight, it mekes a durable railway tie. Again, if snfficiently sound to hold a neil, it is as durable as any kind of timber for the purpose of fence posts. Once fellen to earth, the gients of the forest bid defiance to every form of parasitic growth.

THE impression abroad that the damage done by the storm of December 31st to the Santa Barbara wharf, materially interferes with the loading of vessels, is erroneous. But little inconvenience to the Captain, end none to passengers is experienced, as ships can come right up to the wharf inside of the break.

THE new overshot wheel at the Mnrchie mine, built by J. B. Flack, is 7 feet breast, 125 feet in diameter, and runs, with 150 inches of water, a 50-stamp mill. It cost $2,000, including housing; and as the company has its own water for eight months in the year, it will effect a saving of $25 per day.

MR. J. S. PHILLIPS has fitted up offices, for instruction in the various departments of mining and assaying, at No. 702 California street, opposite the Acedemy of Sciences' building.

ON FILE.—Letter, aecompanying specimens, from S. A. L., Long Valley.

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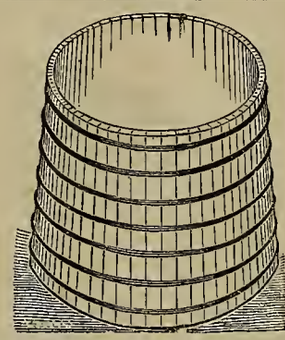

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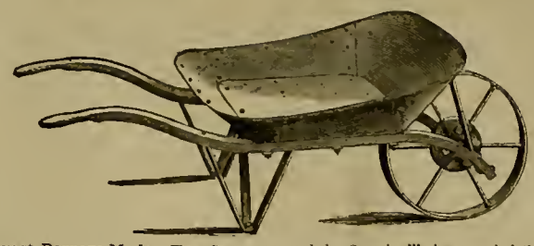

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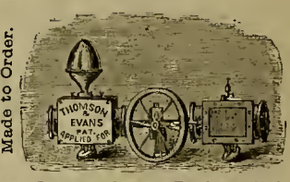

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Continued from page 53.

duced as it was from ore which was taken from the lowest levels of the company's mine, it proves that the deeper we go the more gold the ore contains. The Winthrop company are pushing their tunnel into the mountain as fast as possible, and when they cut their ledge at this depth you may look for a general jubilee in Copper City, as it is well known that this mine contains the richest ore ever found in this district.

TRINITY.

RETURNED.—*Journal*, Jan. 17: E. B. Barnum, of Taylor's Flat, accompanied by Archie McDonald and the latter's son, returned from San Francisco last week. Mr. Barnum thinks he will be able to dispose of his mining property to the company that has lately been contemplating its purchase.

MINING affairs are entirely frozen up and consequently stagnant. More storm and an old-fashioned January thaw are needed to make mining operations active.

TUOLUMNE.

THE MARKS & DARROW MINE.—*Independent*, Jan. 18: We were recently shown some exceedingly rich ore from this mine by one of the Darrow brothers, the gold being disseminated throughout the quartz; the quartz being a fine quality and taken from different parts of the mine. We have visited the property several times, and our opinion has never changed to disfavor, as it has all the indications of permanency and great wealth. The mine is located on the mother lode, well defined, with numberless rich feeders which will pay handsomely to work. It is not one of the mines of short continuance, for Gen. Darrow and his sons, who were the discoverers and locators, have worked it for many years; and when the old General wanted a political stake, or "grub" money, he would, with the assistance of the boys, go to pounding in hand-mortars, and in this manner they have taken out thousands of dollars. It is located in a rich mining section; the gulches, canyons, creeks and ravines have proven to be immensely rich in the region from the grinding down of these common carriers of gold. Tuolumne has been one of the richest placer mining counties in the State, and as it has been proven that quartz is the mother of gold, it therefore augurs well for our numerous quartz ledges. If capital would take hold of a few such mines in our county it would infuse new life to our camps and bring prosperity to every one.

YUBA.

TUNNELS.—Nevada City *Herald*, Jan. 18: The Yuba River mining company have run a tunnel 300 feet under the river at Long Bar, and struck gravel which pays $3 to the pan. This is the pioneer mining enterprise of what promises to be a success in reaching the beds of the present river channels. The following claims are located for that purpose along the Yuba river: Yuba, Long Bar, West Point, Nichols' claim, Olmstead, North Star, Sand Flat, Ohio and Tennessee. These companies are all corporations, and the larger part of the stock is held in Grass Valley. There are many places under the late river channels which have never been worked. The tailings from the larger mining operations above coming down and covering them up. Formerly miners tried working these places by wingdams and other contrivances to turn the water when it was low, but the debris has become so deep that it took nearly all summer to get down where the good pay was, and then the high water would come and wash away the dams and fill up the holes so that the same work would need to be repeated each summer, and the gravel has become so deep in the modern river beds that it made the seasons too short to enable advantageous work. Now a shaft is sunk on the bank and tunnels are run under the river bed, in search of the pay gravel.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, Jan. 22: The foundations for the new air compressor are completed ready for the machinery. The diamond drill in the face of the north drift on the 2200 level has penetrated a distance of 250 feet without finding more than a very slight flow of water. The drill has been taken out and the drift again started up. It will be now pushed directly ahead to connect with the east drift from the 1700 level. Sinking the main incline is making steady progress, the bottom still being in the same favorable character of cap rock heretofore described. It is now down 151 feet on the slope below the 2200 station, and will have only about 16 feet further to go to reach the 2300 level.

CROWN POINT.—The east drift from the winze on the 2300 level is in to-day 462 feet, the face still in very favorable vein matter. The vein at this point has great width, there being no signs whatever of the east wall as yet. The entire stratification of the rock lying next to and west of the ore vein on this level appears to be straightening up and assuming a more perpendicular strike.

CON. IMPERIAL.—The south incline winze, below the 2400 level, has reached a depth of 2600 feet, at which point a station is being cut out preparatory to running drifts both north and south on the ore vein.

GOULD & CURRY.—Crosscuts Nos. 2, 3 and 4 east, on the 1900 level, are all making good headway, without any change of value to report. A joint crosscut west has been started from the bottom of the joint Savage winze.

BEST & BELCHER.—Sinking the Osbiston shaft has made slow headway during the past week on account of the continuous flow of water. The new hoisting engine is working finely.

OVERMAN.—Everything in and about the mine is working finely.

OPHIR.—Daily yield, 75 tons of ore. The stopes on both the 1900 and 2000 levels continue to yield rich ore.

JUSTICE.—A large supply of ore has been extracted and delivered at the mill ready to crush when needed.

CALIFORNIA.—Daily yield, 340 tons of ore. This ore is being extracted from the 1750 and 1650 levels. The ore is of a good quality, and the stopes continue to look well. Another large lift pump is being put in at the 2150 station. As soon as that is completed, which will be in six or seven days, sinking the C. & C. shaft will be resumed.

CHOLLAR-COMBINATION SHAFT. — The new pumps have been running the greater part of the week pumping water into the Sutro tunnel. Everything working with the greatest perfection.

BELCHER.—The south drift on the 2360 level is being pushed rapidly ahead. It is now in 544 feet. The east drift at the 2560 station is being pushed rapidly ahead, the face in west country rock that blasts out and works well.

BULLION.—The north drift on the 2000 level is making good progress and will complete a connection with the main incline in three or four days more. The face is in a mixture of quartz and porphyry of a fine character.

NORTH CONSOLIDATED VIRGINIA.—The new machinery for the mine is beginning to arrive by the car-load, and will all be on the ground ready to place in a very short time.

HALE & NORCROSS.—The week has been mostly spent in putting in the connecting station at the combination shaft, running drifts and sinking a winze at that point to connect with the water tank 30 feet below the station, laying pipes and getting ready generally for sending a flood of hot water through the Sutro tunnel.

CON. VIRGINIA.—Daily yield, 80 tons of ore, which is being reduced as it is extracted. This ore is taken mostly from the 1500 and 1400 levels. The west drift on the 2150 level is in 147 feet, the face in hard blasting porphyry. A new lift pump is being put in at the 2150 station. As soon as that is completed, sinking the main shaft will be resumed.

JULIA CON.—Repairing the main south drift on the 1800 level is making better progress, the drift being less caved, and the necessary repairs consequently much lighter. The heat in this drift is intense, being so great at times that it is all the most hardened of miners can do to stand it.

SUTRO TUNNEL.—Owing to the great heat the progress of the south lateral branch toward the Julia shaft is somewhat retarded, but it ought to reach and connect with the shaft in the course of a week or 10 days. Nothing definite can be said regarding the use of the main tunnel as a drain for the mines until pending negotiations can be concluded between the mining companies and the tunnel company.

YELLOW JACKET.—The new shaft is now down 3192 feet; ground hard, but working well. No water to interfere.

SAVAGE.—On the 2100 level the south drift from the bottom of the north winze is steadily advancing, with the face in a fine, favorable character of quartz and vein matter.

UTAH.—The new powerful hoisting engine will be in readiness to start in 15 days more, if no unusual delay occurs.

ARIZONA.

COAL.—*Sentinel*, Jan. 18: The discovery is reported of coal beds in the northwestern part of the State of Sonora, at no great distance from the southern boundary of Yuma county. We have before heard similar reports, but investigation proved the mineral to be obsidian in one case and cobalt in another. This time, however, the discovery of genuine coal is announced by parties who are competent judges of the article, and who claim to have proved its character by combustion.

THE Enterprise mine, Pinal mountain, owned by Tweed & Hale, shows a five-foot vein. The approximate value for the whole width is about $150; the assays from $40 to $500 per ton. The shaft is now down 43 feet.

COLORADO.

SAN JUAN.—Leadville *Eclipse*, Jan. 2: One of the most successful furnaces in Colorado is that of the Norfolk & Ouray company, at Ouray, in San Juan. The operations of the company were commenced in the summer of 1876, by M. S. Corbett, who is Superintendent. A few weeks since the company purchased for $75,000 the very valuable property, at Ouray, known as the Begole mineral farm. The construction of the furnaces were put under the charge of W. H. Strout. With 25 men at work on the mineral farm it is expected to run the entire winter with that ore and what is now on hand from the other mines of the company. The capital for the building of the furnace and the purchase of the mines has been furnished by parties at Norfolk, Va. It is expected that the profits for the first year in which the furnace will be run will be sufficient to reimburse the outlay. The mines and furnaces are valued at $2,000,000.

LEADVILLE.—In the first year of its existence Leadville yielded nearly [$4,000,000—from 30 mines situated within a space of two miles square. A smelting company has organized in Illinois for the purpose of treating Leadville ores, and through an agent have secured six acres of land on the Oro company's placer ground at the west end of the town, on which to erect buildings.

IDAHO.

SALMON FALLS.—Cor. Salt Lake *Tribune*, Jan. 5: We have a district formed here called the Salmon Falls mining district, running from the mouth of the Malad to Payne's Ferry, taking both sides of the river for four or five miles. Mr. Davis, who is superintendent of the Cave & Davis bar, at the falls, has his machine almost finished, and expects to commence operations about New Years. Morrow, of the Morrow & Jacob's bar, is here getting things ready on their claim, and digging a ditch to put up plates as soon as the road opens in the spring. There are two other districts formed on the river, one above, reaching to the famous Shoshone falls, and taking in that most wonderful canyon with perpendicular walls 400 feet high, and where men in 1869-70 made as high as $100 a day to the man with a rocker, a copper plate and a bottle of cyanide of potassium. The other district is the Eureka, below us, in both of which there are new locations made every day. By the way, there were men who made $9 per day to the man at Payne's Ferry, the upper end of our district, and Wickham and Donovan, with a small beach machine and a few sluice boxes, have been averaging $15 to the man ever since they started up last February.

FLORIDA MINE.—*Idaho Avalanche*, Dec. 28: The first crushing of unassorted rock made the handsome yield of $62 to the ton.

BURNT RIVER.—The placer mines are good on Chicken creek. They have completed a ditch eight miles long at a cost of $5,000. Ten claims are being prospected, and will pay $10 per day to the hand.

SOUTH MOUNTAIN.—J. M. Brunzell returned here from South Mountain on Thursday. He states that the place is alive with men who are locating new claims and relocating old ones.

UTAH.

ONTARIO MINE.—Salt Lake *Tribune*, Jan. 1: Last July a new shaft was started north of and about 310 feet from the old shaft. This has two hoisting compartments of 4½x5 feet each, and one pump compartment 5x7 feet, and is now down on a level and connected with the 500 level of the mine by a 247-foot crosscut. On the new shaft is erected the new hoisting and pumping works, 100 feet in length by 50 feet in width, and the hight above the gallows frame over the shaft is 65 feet. These works were designed by Messrs. Salkeld & Eckart, of Virginia City, Nevada, and erected under the personal supervision of Mr. Salkeld and James McMillan, his foreman. As soon as the water is out of the mine this shaft is to be continued for 100 feet more, and a level started east and west on the ledge. It is expected that the works will be completed and the extraction of ore commenced the latter part of this month. Although the old works of the Ontario company were destroyed by fire on the 19th of October last, they have continued paying dividends, as they happened to have on hand at the mill a lot of 2,500 tons of ore. The yield of the mine for 1878 was $1,445,766.83.

OLD PROBABILITIES.—The Eastern weather god has finally undertaken to fix up the weather for the Pacific coast. His first utterances are as indefinite as the Delphian oracles, and will probably suit all cases. He begins by prognosticating for the coast in three divisions, lower, central and upper, which may, we presume, embrace all the coast line from Aspinwall to Alaska; and thus having a wide mark, he may hit somewhere, as the boy thought when he fired at the barn. However this may be, we doubt not the Signal Service will localize their prophesies as fast as possible, and the difficulties of the problem they encounter will permit. It is true that our meteorological conditions seem so grouped in grand divisions that there will be a degree of monotony in the daily forecasts, but there are certain periods when a foreknowledge of coming rain will be of great value to our agriculturists and warning of approaching storms, will always help the mariners. One point of especial importance to the agriculturist, is the coming of the October rains. At that season of the year, the raisins and other drying fruits are exposed, and a day's warning of rain would be worth thousands of dollars to the producers. As these interests are yearly increasing, the value of the warning will proportionately increase, and we trust that it may be forthcoming. There will doubtless be other practical and important applications of the information as soon as it assumes the definiteness attained at the East, and we are glad that our coast has been embraced in the system.

A DISPATCH from Pendleton, dated 17th, via Walla Walla, the 18th, says: "Aps, the remaining Indian convicted of complicity in the murder of whites last summer, was hanged here to-day. The same precautions were observed to prevent trouble. A number of whites and Indians attended the execution. Several prominent Indians addressed the whites, assuring them of peace in the future. Two hours before the execution, 'Aps' bid farewell to his people. He said he died as an innocent man; he had killed no one; abjured his people to profit by his fate, to always remain steadfast friends to the whites and not harbor ill feeling towards them."

WHAT AND HOW?

In this column are printed all sensible inquiries relating to and connected with mining or relating to any matters of general scientific interest; also the answers to them as dictated by individual experience, or as furnished by correspondents.

Practical Questions in Hydraulic Mining.

S. S. H., of Leadville, Colorado, writes that he is in need of information on the following questions:

"What is the heaviest grade per mile that can with safety be given to a ditch to carry 5,000 miners' inches of water, running through firm gravel and loam? (California experience preferred).

"How many cubic yards of light gravel would a four-inch giant move, having 100 feet heads, in 12 hours?

"Will you please be so kind as to give me the address of a few hydraulic mining engineers and mining superintendents of practical experience in managing placer mines?"

In loam, you should not exceed eight feet to the mile. Gravel will bear almost any grade, depending upon its consistency. If uncemented, and containing large boulders, the grade may be between 8 and 16 feet, or even more. Although data have been published in regard to the execution of water under similar circumstances (see Waldeyer in Raymond's reports, about 1873. Bowman's report on the California Water Company's operations in the Georgetown divide, and Bowie's treaties on Hydraulic Mining), the outlet grade, and some other particular conditions that may be implied in your questions, would have to be particularly stated. Hamilton Smith or Mr. Perkins, of the N. Bloomfield Co.; Daniel McGanny or G. P. Thurston, of the Smartsville Co.; Jos. McGillivray or Herman Schussler, of San Francisco; or either of the authors of the reports mentioned, will answer your questions correctly, if you will specify all the essential conditions.

THE ICE BRIDGE AT NIAGARA.—Niagara river below the falls is spanned by a bridge of ice one mile long and 60 feet wide. The river has been spanned in this way before, but seldom, if ever, so early as now. The other day the ice "jammed" beneath the upper suspension bridge. Says the Buffalo *Courier:* A vast quantity of water had accumulated behind the ice and made a desperate effort to get free. The enormous body of snow and ice was raised up by the water and tossed about in all directions. Large blocks, weighing hundreds of tons were lifted into the air. Boulders were torn from the shore and swept into the stream, and a solitary fir tree, which ordinarily stands three feet above high water, was carried away. The pondering strength of the enraged waters was so apparent that it seemed as if they would rend the great gorge in twain, and in that way escape from their imprisonment. As they could not break the mile-wide dam in two, they lifted it bodily into the air and rushed away beneath it, leaving a span of ice above and behind them. The formation of the ice in this bridge is not the same on both sides of the river. On the American side it is chiefly composed of snow formed into rounded boulder shapes, and looks like white coral. As one approaches the center of the river the ice fragments become larger, and near the Canadian shore huge cakes of water-ice are formed into a solid mass. In some places there are crevices 25 or 30 feet in depth, but water is not seen through them.

IN the District Court at Marysville Monday morning, Ah Ben, through an interpreter, pleaded guilty of murder in killing McDaniel in October last. Monday next is set to hear testimony and fix the degree of punishment. Ah Gee, charged with murder in killing a Chinaman on Yuba River bridge, was arraigned, and Wednesday set to plead.

F. E. DAVIS, of San Francisco, and F. W. Stone, from Australia, ran a 100-yard race for a purse of $1,000, in this city. Davis won in 10½ seconds. In Ukiah a 100-yard foot race was won by Bill Cramer, of that place, in the good time of 10 seconds, beating Joe Barbor, of Lake county, about 10 feet.

SAYS the Dixon *Tribune* of Saturday: Most of the orange trees in town which were last week supposed to be dead, will come out all right. In fact, the orange trees appear to stand it better than the gum trees.

THE District Court, in Calaveras county, which meets the latter part of this month, will have to try five indictments for murder. Among the accused are four Chinamen, an Indian and one white man.

PERSONAL ADORNMENT. — The number of people who have drawn upon the stock of Palmer Bros., for their handsome clothing, underwear, toilet articles, etc., during the last few weeks, is beyond count. The firm, at their establishment 726 to 734 Market street, have a splendid variety of goods to choose from, and one can hardly go amiss in seeking everything necessary for personal adornment and comfort at their store.

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By Special Dispatch from Washington, D. C.

211,595.—COIN PRESS.—T. Scott, S. F., Jan. 21st.
211,596.—COIN PRESS.—T. Scott, S. F., Jan. 21st.
211,688.—AMALGAMATOR.—J. B. Reynolds, S. F., Jan. 21st.
211,558.—FINGER RING.—R. W. Edwards, S. F., Jan. 21st.
211,546.—STEP LADDER.—E. M. Benjamin, S. F., Jan. 21st.
6,959.—TRADEMARK FOR MUSTARD AND SPICES.—D. Ghirardelli, S. F., Jan. 21st.

News in Brief.

THE ice gorges in the James river have broken up.

THE charter of the Louisiana lottery has been repealed.

THE distress among workingmen in England increases daily.

THE jail at Pine Bluff, Ark., was fired by a prisoner Saturday night and destroyed.

THERE were 103 deaths from scarlet fever in New York last week, against 274 the week before.

THE popular vote in Switzerland gives a large majority in favor of a subvention to Alpine railways.

THE Upper Columbia river is almost clear of ice, and boats will commence making regular trips.

AN attempt was made recently in Candabar to assassinate Major St. John, of the British army.

THE Zulu King expresses a willingness to accede to some of the demands of the British ultimatum.

A PHILADELPHIA dispatch announces the death of John B. Biddle, Dean of Jefferson college.

CAPT. JOHN IRWIN has been ordered to the command of the receiving ship *Independence* at Mare Island.

AN indictment has been found in Florida against Lieutenant-Governor Hull, on a charge of conspiracy.

THE Sub-Treasury building in New York, is being fortified against any raid upon its treasure in case of a riot.

IN a collision off the coast of Spain, the British sailing vessel *Lancashire Witch* sunk with all on board.

THE recent report relative to Germany's intended action towards the Samoan Islanders is denied from Berlin.

THE Directors of the City of Glasgow bank are on trial at Edinburgh, charged with fraud, theft and embezzlement.

THE indirect taxes of France during 1878 yielded a revenue of 2,025,770,000 francs—an increase of 75,672,400 francs.

ANDRE CHRISTOL, the wrestler, had his collar bone broken at Detroit, Saturday night, in a match with J. H. McLaughlin.

SIX cotton mills at Preston, Eng., running 188,144 spindles, have given notice of a reduction in wages of from 5% to 10%.

JOHN G. COMPTON, ex-postmaster of Columbus, Neb., has been sentenced to 10 years' imprisonment for robbing the mails.

A JUDGE OF ELECTION in Baltimore has been fined $100 and four months' imprisonment for assaulting a Deputy United States Marshal.

IN sinking a well at Ione, Amador county, recently, James Parkison struck a vein of coal, through which he has already bored six feet, without exhausting it.

J. A. JOHNSON, Secretary of the Constitutional Convention, has tendered his resignation. It was accepted, and Ed. F. Smith was chosen as Secretary in his place.

LADIES AND GENTLEMEN are both alike provided for by Palmer Bros., in all things fitted to give satisfaction and comfort in the way of clothing, furnishing goods, laces, millinery, and the 1,000 articles needed in fitting up the "human form divine." You can supply your whole family at little expense, by consulting Palmer Bros., at 726 to 734 Market street, S. F.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

HENRY R. EWALD is our general correspondent and agent for Arizona.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., January 22, 1879.

BAGS—Jobbing.	
Eng Standard Wheat	9 @ 9½
Neville & Co.	
Hand Sewed, 22x36	9 @ 9½
24x36	—@—
23x40	11 @
Machine Swd, 22x36	9 @ 9½
Flour Sacks, halves	8½@10
Quarters	5½@ 6½
Eighths	3½@ 4
Hessian, 60 inch	12 @13
45 inch	8½@ 9
40 inch	7½@ 8
Wool Sacks,	
Hand Sewed, 3½ lb	47½@50
4 lb do	52½@—
Machine Sewed	50 @ —
Standard Gunnies	13 @14
Bean Bags	7½@ 8½
CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits,	
2½ lb cans	2 00 @ —
Table do	3 00 @ —
Jams and Jellies	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef,	
2 lb, doz	4 00 @ —
do Beef, 4 lb, doz	6 50 @ —
Preserved Mutton,	
2 lb, doz	4 60 @ —
Beef Tongue	6 50 @ —
Preserved Ham,	
2 lb, doz	6 50 @ —
Deviled Ham, 1 lb,	
doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
COAL—Jobbing.	
Australian, ton	8 00 @— —
Coos Bay	6 50 @ 7 00
Bellingham Bay	6 50 @— —
Seattle	6 00 @ 6 50
Cumberland	14 00 @— —
Mt Diablo	4 75 @ 6 00
Lehigh	13 50 @— —
Liverpool	7 50 @ 8 00
West Hartley	10 50 @— —
Scotch	10 50 @— —
Scranton	11 50 @— —
Vancouver Id	7 00 @— —
Charcoal, sack	75 @— —
Coke, bbl	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	4½@ 5½
do in cases	5 @ 6
Eastern Cod	— — @— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @— —

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
NAILS.	
Ass'ted sizes, keg	2 90 @ 3 00
OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @ —
do, No. 2	1 05 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	72 @ —
Boiled	75 @ —
Cocoanut	55 @ —
China nut, cs	70 @ 72½
Sperm	1 40 @ —
Coast Whales	40 @ —
Polar	45 @ —
Lard	90 @1 00
Oleophine	22 @ 22½
Devoe's Brill't	22 @ 23½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	37½@ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	5 @ 5¼
Hawaiian	7 @ 7¼
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	10 @ 10½
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal., ½ lb glass	1 50 @ —
SUGAR, ETC.	
Cal. Cube, lb	11¾@ —
Powdered	11¾@ —
Fine crushed	11¾@ —
Granulated	11 @ —
Golden C	9½@ —
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., January 22, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., January 22, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 21
Jodot, 8 Kil., doz	48 00 @50 60
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
eather, Harness, lb	35 @ 38
LFair Bridle, doz	48 00 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	18 @ 21
Wax Side	17 @ 80

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, January 22, 3 P. M.

SILVER, 2¾@2½. GOLD in New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@22 ℔ cent. discount.
EXCHANGE on New York, 35, on London bankers, 49¼@49½. Commercial, 50; Paris, five francs ℔ dollar; Mexican dollars, 87¾@89.
LONDON Consols, 94 7-16; Bonds, 109¾.
QUICKSILVER in S. F., by the flask, ℔ lb, 40@41c.

LUMBER.

WEDNESDAY M., January 22, 1879.

CARGO PRICES OF REDWOOD.	
Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE. RETAIL PRICE.	
Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	1
REDWOOD. RETAIL PRICE.	
Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending January 21, 1879.

Jan 15	Jan 16	Jan 17	Jan 18	Jan 19	Jan 20	Jan 21
HIGHEST AND LOWEST BAROMETER.						
30.343	30.307	30.434	30.522	30.408	30.194	30.221
30.271	30.245	30.297	30.459	30.217	30.132	30.157
MAXIMUM AND MINIMUM THERMOMETER.						
49.3	50	49	52	59	56.5	56
41	42.5	44	42	42.3	45	44
MEAN DAILY HUMIDITY.						
67.7	60.3	78	09	63.7	63	73.3
PREVAILING WIND.						
S	N	N	E	N	N	NE
WIND—MILES TRAVELED.						
200	151	137	152	162	139	132
STATE OF WEATHER.						
Fair.	Clear.	Fair.	Clear.	Clear.	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
		.05				

Total rain during the season, from July 1, 1878, 4.37 in.

We have on hand some 400 to 500 lbs. of brevier, in good condition, for sale at a bargain. Will sell a part only if desired. Second-hand cases to match. Also a font of bourgeois in first-rate order, with cases. Also a cabinet and upwards of twenty fonts of good display type, not very old and but little used. Some of the fonts are large,

Printing Type For Sale Very Low.

of modern style, and what might be termed good substantial display type for advertisements and job printing.

A good proof press will also be sold at a greatly reduced price from cost.

We can fit out a good country printing office nearly complete at a moderate cost. Call and see the material.

DEWEY & CO.,
Publishers, No. 202 Sansome street, San Francisco.

Patents for Mining and Farming Lands.

Having complete arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing an establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in case of necessity secure the services of our home and Washington branch agency.

DEWEY & CO.,
Solicitors of Patents for Lands, Mines and Inventions, MINING AND SCIENTIFIC PRESS OFFICE, No 202 Sansome St., San Francisco

WATSONVILLE, July 29th, 1873,
MESSRS. DEWEY & CO.—*Gents:*—I was not expecting my patent so soon. You certainly kept your word when you said no time would be lost. I remain, yours truly,
W. T. EASTERDAY,

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 20th day of December, A. D., 1878, an assessment (No. 40) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of January, 1679, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 18th day of February, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco California.

Griffith Consolidated Mill and Mining Company

—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 21st day of January, 1879 an assessment (No. 1) of twenty cents (20c) per share was levied upon the Capital stock of the Corporation, payable immediately to the Secretary, at the Office of the Company, Room 48, 330 Pine Street, San Francisco, California.

Any Stock upon which this Assessment shall remain unpaid on the 26th day of February, 187·, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, March 26th, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees. GEO. M. CONDEE, Sec'y.

Office, Room 48, 330 Pine Street, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of January, 1879, an assessment (No. 15) of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the Company, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal., or the Assistant Secretary at the office No. 9 Nassau St., New York, N. Y.

Any stock upon which this assessment shall remain unpaid the twelfth day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the twelfth day of March, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Sec'y.

Office, Room 33, Nevada Block, No. 309 Montgomery St., San Francisce, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6,) levied on the 19th day of November, A. D., 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Boring, I C	32	1200	$60 00
Bohn, John	150	200	10 00
Lehmann, C	129	2750	137 50
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Storer, J F, Trustee	58	250	12 50
Schmitz, F	205	400	20 00
Turner, J W	65	200	10 00

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of November, A. D., 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, Cal., on Tuesday, the fourth day of February, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

UNITED STATES
Mineral Land Laws, Revised Statutes
AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Surveys; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of $500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,
Publishers of the MINING AND SCIENTIFIC PRESS, S. F

PALACE RESTAURANT

218 Sansome St.

This elegant and spacious S. F. Restaurant has been re-opened with superior bill of fare daily, and is now the best and most popular dining saloon on this Coast.

Good Living at Reduced Prices

[Lunch ready at 10 A. M.] Resident business men and visitors from abroad will be wise in giving this place an early call. Examine bill of fare and prices.

HERMAN H. HORST, Prop'r.

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At the Old Stand, Market, head o Front Street, S. F.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

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STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California.

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

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California Machine Works,

BIRCH, ARGALL & CO.,

119 Beale Street, San Francisco.

☞Geueral Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Bredie's Patent Rock Crushers and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

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SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

UNION IRON WORKS.

Office, 61 First St. | Cor. First & Mission Sts., S. F. | P. O. Box, 2128.

BUILDERS OF

Steam, Air and Hydraulic Machinery.

Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES, HORIZONTAL ENGINES, AUTOMATIC CUT-OFF ENGINES, COMPOUND CONDENSING ENGINES, SHAFTING, BABY HOISTS, VENTILATING FANS, ROCK BREAKERS, SELF-FEEDERS, PULLEYS, STAMPS, PANS, SETTLERS, RETORTS, ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO.

HAWKINS & CANTRELL,

MACHINE WORKS,

210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturers of

IMPROVED PORTABLE

Hoisting Engines,

For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery.

Pacific Rolling Mill Co.,

SAN FRANCISCO, CAL.

MANUFACTURERS OF

RAILROAD AND MERCHANT IRON,

ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

☞ Orders Solicited and Promptly Executed. Office, No. 16 FIRST STREET.

Fulton Iron Works.

Hinckley, Spiers & Hayes.

(ESTABLISHED IN 1855.)

Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers.

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

Mining Machinery.

Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

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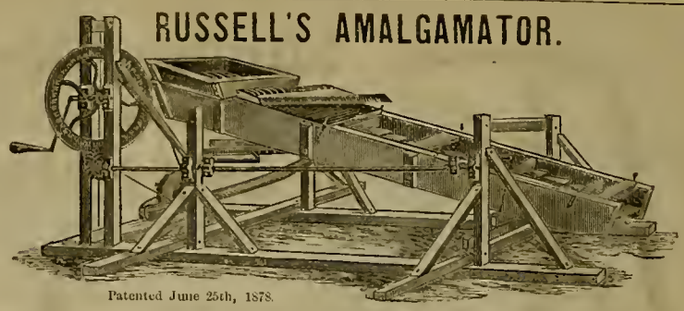

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HAS AUTOMATIC FEED.

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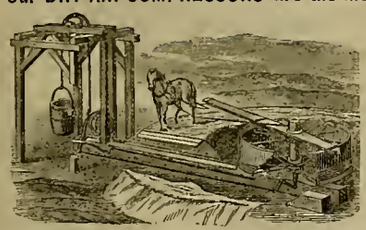
Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



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This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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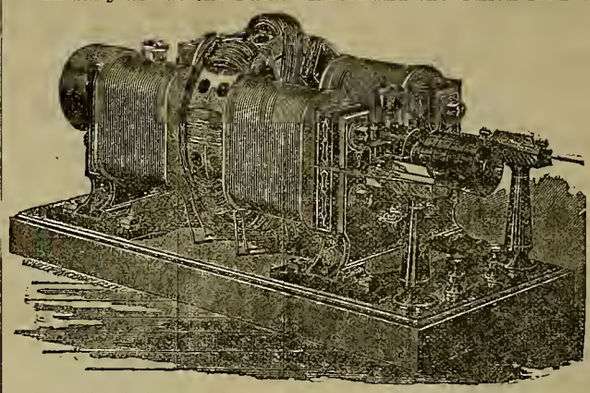

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DEWEY & CO., Patent Solicitors, S. F.—*Gents:* I am much obliged to you for courtesy shown me, and am much pleased with the manner in which you have done my business, and assure you, will cheerfully recommend you to my acquaintance needing such services. Hope to have a case again before long, of my own. I have been an inventor all my life, but let others reap the benefit, or bad work stolen from me. Please have the extra copies of my patent, etc., mailed to me direct, and oblige

Yours truly, J. H. WOODRUM.

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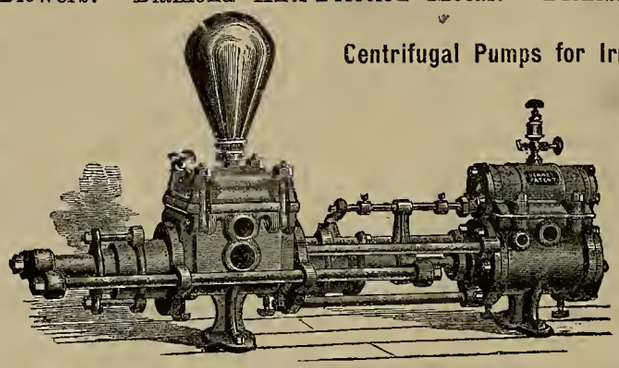

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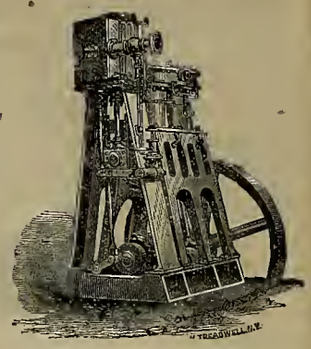

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This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot he found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50

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AURORA, Nev., Dec. 7th, 1878.

MESSRS. DEWEY & CO., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

Dewey & Co {202 San-some St.} **Patent Ag'ts**

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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS
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Stronger, Better and Safer than any other High Explosive.

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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For the half year ending this date, the Board of Directors of THE GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of seven and one-half (7½) per cent. per annum, and on Ordinary Deposits at the rate of six and one-fourth (6¼) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of January, 1879. By order.

GEORGE LETTE, Secretary.

San Francisco, December 31st, 1878.

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ELECTRIC MILL, Butte Co., Cal.

ALMARIN B. PAUL.—*Sir:*—Yours requesting my opinion of your barrel, received. You can state I have used one for about three years, and that it has proved all you represented it to be. It does more good work, in reducing quartz fine, for less power and wear and tear, than any machine I know of. The simplicity of the barrel, the economy and perfectness of operation of the automatic feed and discharge, will satisfy anyone. I have run the barrel for weeks, day and night, without any stoppage whatever—only on Sundays. The barrel requires but very little attention—in fact no more than a stamp batery. I expect to soon send you an order for another.

Respectfully,
C. H. ROLLINS, Supt.

For particulars and circulars apply to
ALMARIN B. PAUL,
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

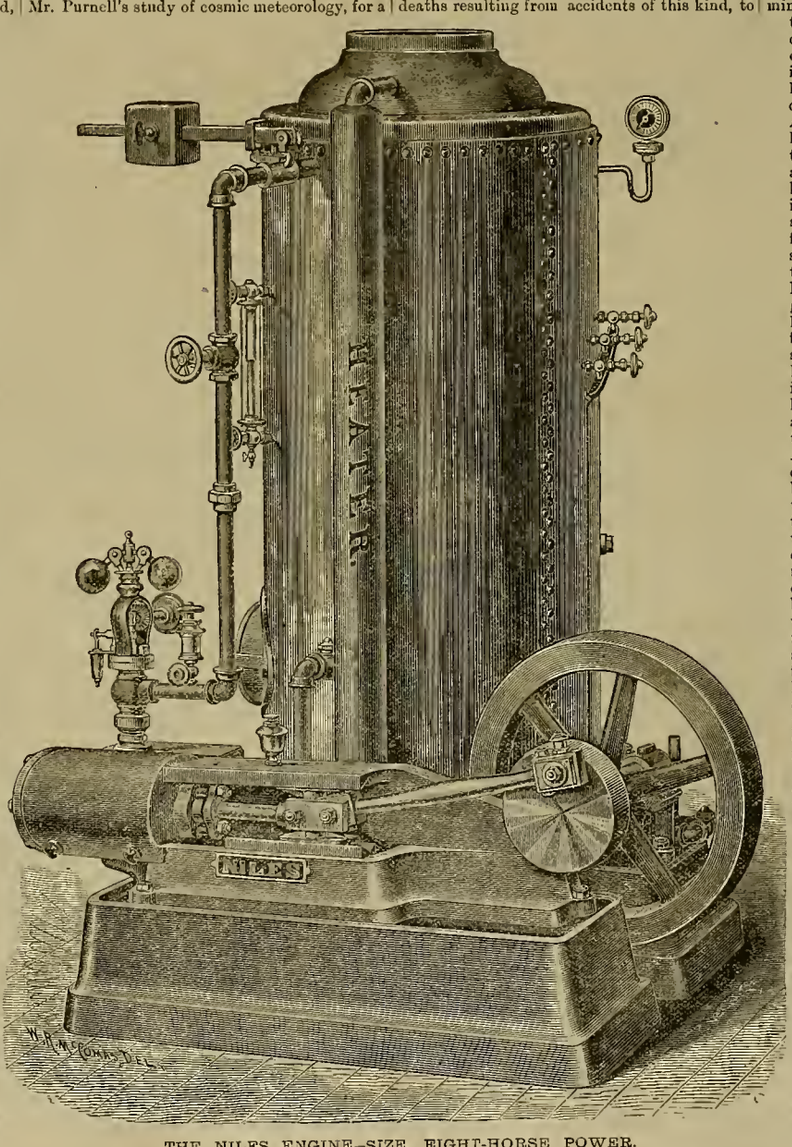
BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, FEBRUARY 1, 1879. VOLUME XXXVIII Number 5.

The Niles Steam Engine.

The increasiug use of steam in various work pertaining to the industries of every day life is bringing out a class of smaller sized engines and boilers which are admirably adapted to the purposes for which they are designed.

The Niles engine, shown in the illustration on this page, is certainly of very handsome and symmetrical design, and it has points in its style of manufacture and the materials used, which commend it to attention. The size shown in the engraving is that ranked as 8-horse power, but there are smaller sizes and larger sizes made to suit the requirements of the user. The smallest engine is warranted to develop 2-horse power and the largest 12-horse power, with 60 pounds of steam pressure. The intermediate sizes are 4, 6, 8 and 10-horse power. The engine and boiler are mounted together upon a substantial cast-iron base, forming a complete power outfit. The engine is not attached to the boiler, but is erected on the same base with it. It is, therefore, not subject to the injurious effects of contraction and expansion. The bearings are not heated, and the lubricating oils are not baked on the working surfaces. Neither is the engine injured by vibration when running. Each engine above four horse-power is provided with a heater, into which the exhaust steam escapes; the feed water is heated up to nearly the boiling point (212°) before entering the boiler. The advantage of this is apparent, as it costs nothing to heat the water in this way. It produces a decided saving of fuel, and the injury to the boiler incident to injecting cold water is avoided.

The boilers are made of the very best material, entirely wrought-iron, and are of ample size to furnish the engine with steam when exerting its maximum power, having 15 square feet of heating surface per horse-power. No cast-iron whatever is used in its construction. The tubes are arranged for complete circulation, and are entirely below the water line, preventing the possibility of leakage. The trimmings are the best, comprising gauge cocks, glass water gauge, steam gauge, safety valve, check valve, blow-off cock and feed pump. The Niles engines are represented on this coast by Parke & Lacy, of 417 Market street, San Francisco, where the machines may be seen and examined by all interested.



THE NILES ENGINE—SIZE, EIGHT-HORSE POWER.

THE SIGNAL SERVICE.—We had the pleasure the other day of meeting Lieut. S. C. Vedder, of the U. S. Signal Service corps, who was on his way to Washington Territory to supervise the construction of a military telegraph line, over a route which Gen. Howard's late Indian campaign showed to be very desirable. We questioned Lieut. Vedder concerning the recent extension of "Old Probabilities" work to this coast, and he said it was the desire of the service to develop the system of prognostications and warnings on this coast as fully as they are now developed on the Atlantic side. There are, however, obstacles in the way, owing to the location and the inability of observers getting foreknowledge of the many storms which come unannounced from the seaward. However, it may appear that the system can be applied with full accuracy as soon as the Pacific coast conditions are better understood, through a longer period of observation. Thus far, during the few weeks which probabilities have been forwarded to this coast, they have proved gratifyingly correct and we have much confidence in the ultimate value of the work of the corps in the Pacific States. We urged upon the attention of the officer the great advantage it would be to our raisin and fruit drying interest to have announcement of the October rains, and he expressed a willingness to bring the matter to the attention of the authorities at Washington on his return from his northern mission. Lieut. Vedder is enthusiastically devoted to the work of the Signal corps and would be gratified to have it prove of as great value here as in the other parts of the country.

ASTROLOGY has in this last century of scientific progress fallen into the saddest disrepute of charlatanry. But such was not always the estimation in which the conjunction of the planets, and of the occult causes of the heavens, were regarded by the profoundest thinkers of the past. The Arabians astrologists were the originators of mathematics, and of the exact methods of dealing with the unknown quantities that gave birth to inductive science after many centuries. We direct the reader's attention to Mr. Purnell's study of cosmic meteorology, for a novelty to which he is leading—the possibility of a scientific reality in what has been hitherto known as astrology.

W. HOLMES, of the Hayden survey, reports the discovery of a large obsidian quarry near the head of the middle forks of Gardiner's river in the northwest of the Yellowstone National park. The deposits are nearly 600 feet thick, and the horizontal extent has not yet been ascertained.

EIGHT companies of troops will take the field in April to overawe the Indians, who are now acting sullenly.

Mining Accidents and the Lessons they Teach.

Having kept a partial list of the fatal accidents that have occurred in our mines during the past year, we find that these casualties aggregate a larger number than most persons would suppose. Our list is imperfect and fails to cover the whole of our mining territory, and yet it embraces not less than 65 or 70 cases of deaths resulting from accidents of this kind, to say nothing of the much larger number of men who have been wounded, or sustained other physical injury, often of a serious character. It is true that in noting these disasters we have not been called upon to record any of those fearful catastrophies that so often occur in the coal mines of England and other of the older countries, and in which hundreds of lives are sometimes sacrificed in an instant, or, what is worse, through the agonies and horrors of prolonged suffocation. As yet we have happily been spared these appalling disasters; the fire in the Yellow Jacket mine, in which some 20 or more lives were lost, approaching the nearest to them of anything that has occurred in our mining history. But considering how comparatively free our mines are from suffocating and explosive gases, the cause of most of these fatal accidents in the old countries, the annual loss of life on this coast is so deplorably large that we feel constrained to urge upon the attention of mining companies the necessity of adopting additional precautionary measures for diminishing their number in future.

From the imperfect record of these fatalities kept by us, we judge that the largest number of them is due to caves occuring in the stopes, drifts or other underground workings of the mines, not less than 15 having resulted from this cause the past year. Next in frequency comes deaths from blasts, premature and otherwise, their number for the year amounting to at least 10 or 12. Eight or ten men have been asphyxiated, dying from smoke or deadly gases accumulated in the mines. About an equal number have been killed by falling down inclines, shafts, etc., through the breaking or parting of ropes and cables, falling from buckets, etc. Several have been killed by rocks, timbers, etc., falling upon them while at work below, several also from overheat; one or two from cars descending upon them, etc. Besides the killed, a still larger number of these men have been wounded, some slightly, others sorely—not a few, in fact, so grievously that death itself would perhaps have been a better fate. When a man in the prime of life has his eyes blownout; is so crushed, dismembered and disfigured that he looses almost all semblance to humanity; is rendered for the balance of his days a helpless, sightless cripple, it were almost a mercy had he been killed outright, rather than he reduced to such a woful condition. And yet to this pitiful state a good many of these unfortunate men are every year brought. That they are entitled to universal commiseration none will deny, though there be those who affect to think that the wages of the miner might justly suffer a considerable reduction. And so, perhaps they might, if only the number of hours he works or the amount of labor he performs are to be taken into consideration. This, however, would be far from just. As the professional man is paid extra for his knowledge and skill, so should the miner be paid extra for the exposure of health and the danger to life and limb that in the prosecution of his duties he is forced to incur; and that his present rate of wages more than fairly compensates him for this additional hazard no right-minded employer will contend.

But while the employer should not grumble at the wages paid the miner, it would be well if the latter, in view of his dangerous occupation, were to exercise a little more prudence than is his wont, and endeavor to make better provision for his own wants, should he be thrown out of employment, or through accident be temporarily unfitted for work, as well as for the support of those who may be dependent upon him in the event of his death. To this end benevolent associations of a permanent and well-guarded kind should be more generally organized and entered into. Each member while employed and in the enjoyment of health, should contribute a certain amount of his earnings to a general fund, to be administered by such association, and upon which he can draw when sickness or adversity overtakes him. They have societies of this kind already at a few of the principal mining centers, but they should be much more general than they are now, that the working miners are likely to become a large and permanent class in this country.

THE Reno *Gazette* thinks the Nevada State Senate lacks backbone because it refuses to take hold of the hill making the actions of hired fighters in the mines a felony. It thinks the bill should be passed.

GEOLOGISTS having reported that there is in Japan enough workable coal to produce a yearly yield, equal to that in Great Britain 1,000 years, the Japanese government have agreed to grant a loan of $1,500,000 for the purpose of working them.

MARSHAL MCMAHON has resigned.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Investigate and Stop the Loss.

Editors Press:—The following letter has heen received hy me from Yreka, Siskiyou county, Cal.:

"I am more and more convinced that it is utterly impossible to save more than a small proportion of the gold contained in the ores of California, hy what is known as the wet process. The result of my own observation and experience goes to show me that your oft-repeated expression that, of every $100 in the ores of California, hut $40 at most is saved, and that $60 goes down the creek is also too true; and 'pity 'tis, 'tis true,' for it is impoverishing our mines and disheartening our miners, and the more I reflect npon the subject, the more I am convinced that the battery, as usually worked, is at hest extremely wasteful, and at most, unsatisfactory in its result. I have in my mind's eye, at present writing, the result of a company, who worked a numher of tons of ore in an arastra, realizing $24 per ton, which all will admit was good.

"But in this fast age the arastra was too slow, so a five-stamp mill was erected, run up to a high speed, from 7 to 10 tons per 24 hours rushed through the hattery, doing a land-office husiness—company in high feather—result of clean-up, $5 a ton! Further result, an assessment to pay indehtedness and mill shut down.

"Some four weeks since, I run 47 tons through a mill, and I hrought all my skill and experience of 27 years to hear on it; yield, $15 per ton, while the result, by arastra, on same ore, was $50 per ton. The ore actually carried $60 per ton. I mention the foregoing as illustrations of the truth of the conclusions I have arrived at, viz.: That it is sheer folly to expect that the finer gold, which is indeed the larger proportion of the gold contained in the ores of California, can possibly he saved by the rush of water necessary to carry off the pulp."

The foregoing is one of many letters I rceive of tbe same import. The writer is one of the oldest and most intelligent quartz miners of this State, and, as you see, an investigator. Now, when I read so many letters, detailing similar results, take my own experience aud look backward over the quartz-mining districts and sce the losses, I am prepared to denounce the stamp hattery, copper plate and blanket system of mining, when it comes to properly utilizing our wealth and giving a just reward for capital and enterprise, as a dead failure.

Success is the exception, failure the rule. Through recklessness or ignorance, and it matters not which, the result is the same. There seems to he hut one idea when men engage in quartz mining, and this is to simply crush rock. Proper devices and careful handling for saving the metal is merely a secondary matter, when it should he the first. The argument is, gold, heing a metal, it necessarily goes to thc bottom, without any consideration of the laws of resistance; but, as experience shows, this way of mining carries the hands of operators too often into their pockcts to foot the hill of losses, hecause crushing rock don't pay.

Statistics of California quartz mining show that 75%, at least, of all the quartz mills erected in this State are failures, while the remaining 25% bas, through extraordinary richness of the ore, heen profitahle enough to keep the husiness alive, and these successful companies should have heen more so hy better working.

More than half the failures would have hecn successes if they had saved 80% of the value of the ore. The idea that it is only necessary to get a set of stamps, hohhing up and down at a lively rate, to crush rock, then to stand hy and look at them wash the sands (and gold) off, should he stoppcd. A law prohibiting this waste of so precious a metal as gold would more than double our yield, and hy so doing more than douhle the mining enterprises. No mine or mill should he allowed to he worked without having a return of 80% of the value of the ore. This rude way of treating our gold ores helongs to an age when science and machinery were not so far advanced as they are at this time. Silver mining is so far ahead of our universal system of gold mining, in the percentage of metal saved, that one, if he did not know it, would not helieve that the working was in the same age.

It is surprising how few gold miners really comprehend, or seek to know, the waste of their hattery working hy this rushing and crushing system—well named, as it crushes rock, fortunes, and spirits at the same time. And how little they desire to improve upon it. I have frequently asserted, and it cannot he done too often, that the average of California quartz mills do not save 33% of the value of the ores worked.

"But," says one, "I save more than tbat; mine is 'free gold.'" Suppose it is "free gold," and so fine that it swims, is it going to resist a stream of water used to wash the coarse sands off? Not at all. It moves on for miles, and it would seem that quartz men would some day come to their senses on this point.

I may he eousidered as on the war-path against our wasteful system, and I intend to he until a more careful one is entered upon. In so doing, I am going to create investigation, as no miner desires to willfully waste his wealth; and this alone will be worth millions yearly to the people of this State. I have several othcr letters, which are of general interest, that I propose answering through the Press; hoping they will he received in the spirit they are given—for our general good. Almarin B. Paul.

San Francisco, January, 1879.

[The foregoing letters in regard to dry crushing are forcible enough, and they sufficiently explain themselves. We will venture the suggestion that, in addition to the argument, carefully prepared details of comparative working, with the figures, would be likely to receive all the attention that the subject deserves from intelligent engineers.—Eds. Press.]

Traction Engine for Plowing.

Editors Press:—In your issue of the 4th inst., "C. W. M.," alludes to using the Doane traction engine for plowing, in a way that leaves room for a discussion, or calls for practical test. As I have made myself somewhat familiar with the subject, the following few hints may he interesting.

In the first place, it can never be practical to use more than three 12-inch plows, because more will rcquire an engine so large and heavy, that it will mire down when the grouud would he in a fit condition to plow. I thiuk tbat if an engine and boiler could he made out of steel that would not weigh more than 2,500 pounds, and run night and day, as it well could he hy using a headlight, that it might he constructed so that one man could work it.

With such an engine, I see no reason why 40 acres could not he plowed in 24 hours, as the speed might he increased to two or three times as fast as horses now travel, and still do good work.

It now costs farmers $5 an acre to plow, sow and harrow, hecause they have to feed their horses so long without work, all of which might be accomplished hy going over the ground once with an engine. Besides it could he used on a threshing machine, steam hay press, or to haul the produce off the farm. A Subscriber.

Orland, Colusa Co.

Cosmic Meteorology.—No 2.

[Written for the Press by Samuel Purnell.]

In 1867 Mr. Baxendell puhlished the results of a scrutiny of the solar radiation registers at Oxford, England, from 1856 to 1864, aud came to the following conclusions, among others: 1st. That the caloriiic intensity of the sun's light is suhject to periodical changes, the maxima and minima of which, correspond respectively with those of sun-spot frequeucy.

2. That it seems prohahle that the heating rays of the sun consist of two kinds, differing in intensity and suhject to periodical changes, the times of maxima of one kind and those of minima of the other corresponding respectively to the times of maximum frequency of spots. He also pointed out a connection between the mean monthly variations of solar radiation in cloudless days, and the mean monthly range of the magnotometer. In 1871 he published further researches on the changes in the distrihutiou of barometric pressure, temperature, and rainfall, under different winds during a period of solar-spot frequency. He found that changes had taken place in the three elements under discussion which corresponded very closely in their times of maxima and minima with those of sun-spot frequency.

In 1875, Mr. H. T. Blanford, of India, stated, that, from experiments conducted in Bengal, "the result is to me very striking, and if not absolutely conclusive as to the direct variation of the sun's heat with the number of spots and prominences, certainly, as far as it goes, strongly confirms Baxendell's conclusions."

In 1875, Profs. Stewart and Roscoe came to the conclusion that there is more sunshine in London in years of maximum than in years of minimum disturhance. In 1876, Prof. Stewart found that the winter temperature range at Kew, apparently depends on the sun-spot period, heing greatest at times of greatest solar movement, and *vice versa*. In 1877, he produced evidence to the effect that the mean daily range of temperature depended, among other influences, upon the state of the sun's surface with regard to spots. In 1870, Prof. Piazzi Smith, as the result of observations made in Scotland from 1837 to 1869, concluded that a great heat-wave occurs every 11 years and a fraction; its maximum slightly lagging hehind the minimum of the sun-spot cycle. In 1871, Mr. E. J. Stone, from an examination of the records at the Cape of Good Hope for 30 years, stated that thc temperature and sun-spot curves present an agreement so close as to compel him to helieve that the same cause which leads to a decrease of meau annual temperature, leads equally to a display of solar spots. Here also was found the maximum heat slightly lagging behind the minimum spots. In 1873, Signor Celoria observed a marked coincidence hetween the temperature at Milan and the sun-spot periods. In 1873, Dr. W. Koppen puhlished the results of a long series of observations on these cycles. From 1816 to 1854, he states that "the coincidence of temperature changes with the sun-spots does not merely extend over the average length of the cycles, hut reflects all the leading disturhances and peculiarities of the sun-spot periods." He considers that there can he no question of the actuality of the coincidences.

The regularity and magnitude of the undulations of the temperature curves are most strongly marked in the tropics, and decrease toward the poles.

3. As to

Wind Disturbances,

The evidence is very uniform. The frequency of such disturhances at times of most sun-spots has heen obscrved in the tropics, where such disturhances are more marked than elsewhere. Dr. Meldrum, of Mauritius, some years ago estahlished the relation of sun-spots and cyclones in the Indian ocean; and he maintains that the whole question of cyclones is one of solar activity, and that if we write down in one eolumn the numher of cyclones in any given year, and in another the numher of sun-spots, there will he a strict relationship hetween them: "Many sun-spots, many hurricanes; few sun-spots, few hurricanes." In 1873, M. Poey conducted similar researches on the hurricaucs of the West Indies, and found the common periodicity strongly marked. In 1877, it was found that the marine casualties disclosed a cycle closely corresponding with the sun-spot period. The percentage of casualties to the registered vessels of England was 17½% greater during the maximum two years in the common cycle than during the minimum two years, in a douhle cycle from 1855 to 1876, inclusive. The percentage of tropical cyclones during the past two years has not yet heen ascertaiued, but that it will be low is evidenced from the fact that few accounts of such disturhauces have been puhlished, and ships have, for the most part, sailed through tranquil seas. According to the theory under discussion this should be the case, as the present year is one of an extreme minimum of sun-spots, and the probable close of the current cycle.

4th.—Rainfall.

On account of its iudustrial uecessities, and in view of the recurrence of periodical famines of certain countries, the relation of sun-spots to rainfall has been much studied of late years, and many interesting facts have heeu gathered. As this series of articles is principally intended for the disenssion of the rainfall of the Pacific coast of the United States, and its relation to the sun-spots fluctuations, more room will be given to it than to the othcr hranches of the suhject. Messrs. Lockyer and Hunter have again presented a summary of the literature in this direction, which, as far as it goes and is relevant, will he freely used without further acknowledgment.

Dr. Meldrum, from a comparison of the rainfall returns of Mauritius, Adelaide aud Brishane, concluded that evidence of the connection hetween maxima and minima periods and the corresponding sun-spot periods, although not absolute, was very striking. In 1873, Gustav Wex made an examination of the depths of water reported in the Elhe, Rhine, Oder, Dannhe and Vistula rivers, and concluded that the years in which the maximum amount of water flowed down the rivers were those of maximum sun-spots, whilc the minimum amount of water occurred during years of minimum sun-spots.

Mr. G. M. Dawson in 1874, stated that the correspondence between the maxima and minima in the solar-spot cycle, and the hight of the great lakes of North America, though not absolute, was sufficiently close to open up a new field of inquiry. From his investigations, it appeared that, from 1855 to 1868, during maximum sun-spot periods, the lakes were on the average, 14 inches higher than during minimum periods. In 1874, Mr. J. H. Hennessey, from an examination of the rainfall of one of the districts of India, arrived at the conclusion that there is a close connection hetween sun-spots and rainfall. In 1874, Dr. Broun, in an analysis of the returns from ten stations, considered it prohable that a difference of two inches in the rainfall might he expected hetween years of greatest and years of least sun-spot area. Prof. John Brockleshy in the *American Journal of Science*, stated that the results of his examination pointed to a connection between the variations in the sun-spot area and the rainfall; the rainfall rising ahove the mean, when the sun-spot area is in excess, and falling below the mean, iu periods of few spots. In 1877, Lockyer and Hunter puhlished their investigations into the whole suhject, and adduced many new facts, principally with respect to the

Rainfall of India.

At Madras, they found that in five out of six years of minimum sun-spots, during the course of 64 years of ohservation, the rainfall fell short of the average supply, and this exception was in 1843, which was due to a sporadic rain storm in May, before the heginning of the southwest monsoon; and that the average rainfall at Madras, is 40½% greater in years of many than in those of few sun-spots. The rainfall cycle of 11 years at Madras, coincides with the cycle of sun-spots. No numerical proportion has yet been found, either in India or elsewhere, hetween the numher of inches of monthly or annual raiufall, and the actual numher or area of sun-spots.

The expressions heretofore used with respect to Madras may he applied, *mutatis mutandis*, to Bombay also.

In 1810, 1823, 1832, 1852, 1865, 1876 and 1877, there was in India a deficient rainfall, and in the succeeding years there were famines; six of these years fell within the three-years group of minimum sun-spots.

The periodicity in the rainfall at the

Cape of Good Hope

is even more strongly disclosed than in that of Madras and Bomhay. Messrs. Lockyer and Hunter, in summing up, find "ahsolute proof of an 11-years cycle in the great factors of tropical rainfall; and we further find that the 11-years cycle in the separate classes of terrestrial phenomena correspond with the 11-years cycle of sun-spots. We helieve that the supposed inconsistency of the rainfall is simply a measure, not of its freedom from law, hut of our ignorance."

Some curious

Deviations

From this new-found law have heen noted, especially in California, which will he considered further on. The winter rainfall of Calcutta and of Sydney, from 1840 to 1876, shows its maximum during the years of fewest sun-spots; and the minimum winter rainfall is shown during the years of most sun-spots; which is the reverse of what ohtains as regards the rainfall for tho whole year, which coincides with the sun-spot curve. The rain records of Jerusalem, which receives its total annual supply of rain during the winter months, have heen found to coincide with those of Calcutta and Sydney in exhibitiug the greatest amount of rain during periods of fewest sun-spots.

Mr. E. D. Archihald claims that his researches upon the rainfall of northern India point to the following facts: In years of maximum sun-spots the summer rainfall is ahove and the winter rainfall helow the average; while in years of minimum sun-spots the summer rainfall is helow and the winter rainfall ahove the average—thus varying inversely as the spots. (*Nature*, Vol. 16).

Mr. O. A. Derhy says that the relatiou hetween sun-spots and rainfall holds good in the intertropical portions of

Brazil;

The mean annual rainfall varyiug from 10.32 in the minimum to 13.55 in the maximum years. The northern provinces of Brazil in 1877 (a year in the minimum group) experienced the most terrible drouth ever known there; and many drouths have formerly occurred during minimum years, and floods in maximum years. (*Nature*, Vol. 18).

Dr. Meldrum has recently shown (*Nature*, Vol. 18) that the raiufall

At Edinburg

From 1824 to 1872 shows a remarkahle coincidence with the sun-spot variations; he finds that at Ediuburg the year of minimum rainfall was on the average the year hefore the minimum sun-spot year, and that the year of maximum sun-spots coincided with the year of maximum rainfall. The rainfall at Paris from 1824 to 1872 also increased and diminished with the sun-spots, the fall heing greatest in the years of maximum spots. The minimum rainfall occurred on the average in the year immediately preceding the year of fewest sun-spots. Dr. Meldrum remarks that the rainfall tahles of Edinhurg and Paris, especially those of Edinhurg, are more favorable to the theory than are even those of Madras. He remarks, further, that the rainfall of 54 stations in Great Britain from 1824 to 1867 was .75 of an inch helow the mean when the sun-spots were helow their mean, and .90 of an inch ahove it when the sun-spots were in excess; and for the corresponding years from 34 stations in America from 1824 to 1867 was .94 of an inch helow, and 1.13 inches ahove.

The very ingenious method hy which Dr. Meldrum arrives at this result I would he glad to apply to the rainfall tables of California, were it not that the principle when fully carried out demands a continuous record of some 50 ycars, and our local tahles not heing even 30 years old a harmonic mean cannot he accurately ohtained; still, a tahle made upon this principle will be found further on.

Without going further at present into the literature of the vexed question of the relation of sun-spots and rainfall, it may now he more profitahle to examine briefly the connection between the spots and

Other Terrestrial

And even celestial motions and phenomena.

Mr. F. Chamhers, of Bomhay, (*Nature*, Vol. 18) considers that the Bomhay harometric observations afford fairly conclusive evidence in favor of the sun heing hottest ahout the time of maximum sun-spot area, and coolest when the spot area is at its minimum. The hest place to ohserve this is in Central Asia, where the annnal variation of the harometric pressure is greater than in any other portion of the globe. The harometric curve lags hehind the inverted sun-spot curve, particularly in the years of maximum sun-spots. Upon the whole there is in India a low pressure ahout the time of average sun-spot maximum, and a high pressure ahout the time of sun-spot minimum.

The parallelism hetween the sun-spot curve and that of the displays of the aurora polaris from 1780 to 1870, was shown hy Prof. Loomis in a striking and convincing manner, and is quoted by Prof. Stewart (*Nature*, Vol. 16,) with approval. In this, the two curves are seen to follow each other closely; many sun-spots, many auroras; few sun-spots, few auroras.

Dr. Fritz, of Zurich, has shown that, in Eu-

Continued on page 70.

Mechanical Progress.

Recent Improvements in Plows.

The improved American plow holds a high rank among the implements of modern husbandry, not only at heme, but in the foreign market. In form, materials and construction it appears to be all that it is capable of being, and yet there are constant developments of new points of excellence. The most obvious improvement within the last few years consists in the use of hard metal, first for the edge, and later for the entire wearing surface. Chilling the edges and point of the share and the bottom of the land-side were the first steps in the line of progress, made about 30 years ago, but within the last 10 years attention has been directed to the importance of reducing the friction of the mold-board. Hardened steel was introduced for this purpose, and is still recognized as the best material where soil is wholly free from grit, but it was found that a chilled surface of cast-iron, in combination with the chilled share and land-side, was more easily kept in repair in all soils containing grit. The well-known process of chilling first resorted to, consisted in running the molten metal against the surface of cold iron. This method, while rendering the metal harder, made it correspondingly brittle, and required great care in the mixture of the iron to make the chill penetrate uniformly. This plan also required a method of annealing, sometimes with hot water, or by building fires on the back of the mold-board, and sometimes by covering with heated sand.

Later improvements in mixing metal have been successfully made, so as to secure entire hardness throughout, without the chilling process. Plows made in this way are usually known by appropriate names, such as "Carbon," "Diamond," "Adamant," etc. Long experience has taught that steel in certain combinations will mix with melted pig iron, and with the addition of certain chemicals will make a homogeneous metal by pouring it into molds at the right time, which time is ascertained by means of its color. In this way the result is "hardness, uniformity and strength."

In former years, plows made of cast iron were so rough that farmers were severely tried in keeping them bright. As plows have grown harder the polish is more difficult to produce, as well as more durable, and on the metal here referred to, is said to suffer little from corrosion. As the friction of the plow is equal to about 35% of the whole force of the draft, every expedient to reduce it is important to the plowman, while every increase of labor is at the cost of some useless expenditure.

A still better improvement in this direction was recently achieved by the introduction of a reversible point in the share, which thus becomes self-sharpening, and enables the farmer to keep the bottom of the plow level, thereby avoiding the friction that arises from a projection of the point of the share below the general level. It has been found that the effect of a sharp point is to sharpen the wing also. Among other improvements by various manufacturers, is the setting of the beam in the center instead of one side of the line of resistance, which is adjustable at the standard so as to produce a balance, avoiding side drafts.

Joining Lead Pipes Without Fire.

In connection with many industrial processes it is desirable to join lead tubing where the use of fire would be practically inadmissible, and to meet these cases an ingenious method has been proposed by Mr. A. L. Bricknell, of Southamptou Buildings, by which he can make a thoroughly reliable and well-shaped joint quickly and cheaply without the use of fire, solder, couplers, or other dangerous or costly materials. To do this he first drives a hard wood or metal plug into the bore of each pipo sufficiently large to admit about one-half on its outer surface. The enlarged lead pipe is hammered up a little to compensate for the reduction of thickness by enlargement, and the ende to be joined are rasped or scraped clean and bright on their faces. The tube is then inserted abent half way into each of them, and by snitable mechanical appliances they are pressed into contact until they are welded together, being united by cohesion, and forming a continuons homogeneons pipe.

The mechanical appliance which he prefers to use consists of the two halves of an outer die, held together by two longitudinal horizontal connecting bolts, on each side, and an inner die, also divided vertically into two halves on a line, which would pass through two power bolts. The outer and inner dies, with the two connecting and two power bolts, and their respective nuts, constitute the press. Power applied to nuts working on the power screws forces the inner die downward upon the thickened end of the lead pipes, and effects the operation of cold welding by pressure, as will be readily understood. The nuts are most conveniently turned, particularly in confined spaces, by ratchet wrenches, which hold in vertical grooves or notches provided around the nuts for that purpose; and, as the power bolts are cut with right and left hand threads reepectively, the wrenches react upon each other, which dispenses with the necessity for holding the press, and saves the lead pipe from tereional etrain. When the joint has been welded, the dies being in halves, are easily removed. The particular office of the tube is to resist the inward yielding of the lead to the force exerted outwardly upon it by the press, and thus compel the lead to receive a much greater pressure than it could otherwise possibly sustain. The grooves or projections on the tube materially aid this result by retarding the escape of the lead from the flanged part of the joint, longitudinally between the tube and the press. The use of the tube, which has the same internal diameter as the pipe, also maintains a full and undiminished here or waterway.

For the purpose of joining lead pipes at an angle to others he casts short and compact T or other suitably shaped junction or branch pipes of lead, and proceeds, as before explained, except that ae such pipes may be cast with enlarged and thickened ends it is not necessary to prepare them by enlarging and thickening, as in the case of ordinary lead pipes. These lead castings may be conveniently made in small iron molds fitted with iron cores, which can easily be removed. Such molds may be arranged to receive the ends of taps and such like fittings, which may thus be cast into the lead junction pipes. In some cases a small ring or short piece of lead pipe may be cast around a fitting at a distance from its end sufficient to allow of its projecting into a lead pipe far enough to form a substitute or equivalent for the internal tube. When this is done the part of the fittings so projected must be grooved to imitate the tube it represents. If a fitting is previously tinned at the part upon which it is intended to cast the lead the latter becomes most firmly attached to the fitting, and when welded to a lead pipe, as described, an extremely solid and reliable combination is the result. A final stop or end to a pipe may be a flanged cap or socket of lead welded on the end of a pipe over the interior tube, in a like manner as two pipes are joined. It will of course be understood that this is only intended to explain the general principle of Mr. Bricknell's invention, for it will be apparent that other devices may be used for compressing the pipes end to end, and that cams, wedges, or other means, may be substituted for the power screws for drawing the two parts of the dies together. Mr. Bricknell's invention is likely to come largely into use, and is certainly most rapid and cleanly.—*London Mining Journal.*

The Wheeler Process for Welding Iron and Steel.

The principle of the iuvention ie to bring the two metals simultaneously to a welding heat in one pile, and then manipulating it. The one important provision—the key of the situation, so to speak—is to effect while in the furnace, and immediately afterward, a practical exclusion of oxygen from the surfaces of steel intended to be welded. This is done by boxing or inclosing the steel with plates of iron, which plates, made to lie in overlapping contact at the corners of the pile and with its end plates, are found to effect a satisfactory exclusion of oxygenating atmosphere. Such a pile, heated gradually so as to permit the snitable penetration of the heat through its mass, bringing the steel into a condition of semi-fusion, is given at last a wash heat, to bring the iron casing to a proper welding temperature, when the whole pile—that is, the box with its contents—is passed through the rolls. After one or more passes, the welding of the iron to the inclosed steel will be attained effectually, and the eteel, when of more than one piece, will be welded into a homogeneous mass.

This process is simply a method of welding, a process which offers for our consideration nothing in any way anomalous, and is one, the laws of which are found, upon examination, to harmonize with those of other metallurgical processes commonly practiced. It has been the practice for a long time to transform quantities of eteel scrap into homogeneous masses by melting it in refractory crucibles, which are kept as such, and which in use are covered to exclude the atmosphere; while in the Wheeler process a malleable crucible is used, which is fed to the rolls of the mill, and the material of which is united to its contents and becomes part of the product. The contents of the crucible are not necessarily melted, as completely in the new practice as in the old, but they are brought sufficiently near to the melting point, to secure homegeniety of product.

Phosphorus in Railroad Iron.—Mr. Alfred Earnshaw, of Philadelphia, contributes to the *Bulletin* of the American Iron and Steel Association an article on the true test of steel rails, which is of considerable interest. Referring to the reported falling off in quality in rails produced in recent years, he states that phosphorus has by general consent been elected the cause, hnt does not know that it has been shown or ever will be shown that a rail with say 0 15% of phosphorus will not wear as well as one with 0.075%, as long as it is well made and contains its due proportion of carben and manganese. The tests made by the railroad companies should be physical tests, such as might be made by Thurston's machine, and the chemical tests should be made by the steel manufacturers. It is obviously no business of the railroads what per cent of phosphorous a rail may contain provided it fulfills the requirements of the physical tests and gives satisfaction in the track, and the steelmaker must be allowed to work out for himself the commercial as well as the chemical problem of how to make cheap rails that will wear most satisfactorily.

Scientific Progress.

Are the Elements Compound Bodies?

Prof. Lockyer's recent announcement to the French Academy of Sciences, that he had discovered that a number of bodies, hitherto considered elements, are really compound bodies, is still exciting much interest everywhere. Since the publications above alluded to, the Professor has read a paper in relation to his investigations, before a very full meeting of the Royal Society of London, which is replete with the most interesting physical facts, but the conclusions and inferences of which, are considered by chemists, as somewhat over sanguine. We condense from a brief summary of this paper by a contemporary, as follows:

His experiments and researches bear upon the subject in two directions. He has examined solar and stellar spectra, and mapped the lines which he has compared to the spectra of what he believed to be pure elements. He finds his results confused by the continued coincidence of numerous lines belonging, presumably, to different elements. Many of these he has found it possible to eliminate by carefully purifying the metals experimented upon; others have remained. But prominent chemists, including Roscee, Frankland, Williamson, in the discussion following the reading of Prof. Lockyer's papers, seemed to believe that the difficulty of eliminating impurities was so great, and the spectroscope so sensitive, that the basis of his direct experiments—the purity of the elements used—was unsound.

Prof. Lockyer, however, claims to possess means for detecting impurities and for distinguishing them from constituents. By former experiments with the spectra, of alloys containing different proportions of two metals, he proved that if one constituent was present in very small quantity, only the lines longest in the spectrum of the pure specimen appeared, while the others came into view only when the amounts in the alloy increased. He argues from this that when the longest line of an element is absent, the body examined is free from it.

His experience with alloys was extended to compound bodies, and here he discovered most remarkable facts. He found that the spectrum of such a compound as chloride of lime, taken at a low temperature, differed from that of calcium; but that when the temperature was increased the spectrum gradually changed, and finally the lines of calcium appeared—a fact which he attributes to decomposition of the compound. Noticing, then, that a further increase of temperature, instead of leaving the spectrum of this so-called element unchanged, causes it to alter continuously as the temperature rises, he argues from analogy, that calcium itself must be decomposable, and, therefore, cannot be a true element.

The examination of the changes in the spectra of elements, he has extended to four—calcium, iron, lithium and hydrogen—from the range of temperature of a Bunsen lamp, to that of the sun, or Sirius, which, being the brightest, is probably the hottest star. Thus, at the temperature of the electric arc, the calcium line in the blue is of great intensity, the violet H and K lines, being still thin; in the sun the H and K lines are very thick, and the line in the blue is thinner and less intense than at the temperature of the electric arc. In the spectrum of the star *a*, Aquilæ, the K line is only half as wide as the line H, while in the spectrum of *a*, Lyræ, and Sirius, only the H line of calcium can be detected. The hotter the star the simpler the spectrum. Mr. Lockyer's experiments with the elements have extended through a period of four years, during which time 2,000 photographs of spectra have been taken, and more than 100,000 eye observations have been made.

That the facts proved by Prof. Lockyer, of a variation of the spectrum of some elements in connection with variation of temperature, experimentally and by the examination of stellar spectra, are highly important, cannot be doubted, and it will be acknowledged that they point strongly to the conclusions which he has drawn from them; but the direct proof submitted in regard to the coincidence of the lines belonging to different elements, as found by the mapping of spectra of pure metallic elements, will not be accepted until sufficient and unimpeachable evidence is brought of the purity of the material experimented with.

The extreme sensitiveness of the spectroscope, going, in many cases, far beyond the means of eeparation at the disposal of chemists, will make the latter cautious in their acceptance of such spectroscopic results. As an instance of this sensitiveness, Dr. Frankland mentioned in the discussion that a trace of copper not exceeding one fifty-millionth part of a grain had given copper lines quite vividly, although only for an instant, while four one-thousandths of a grain had been sufficient to give copper lines continuously for over six houre.

We need hardly add that if Prof. Lockyer does furnish final unimpeachable proofs, chemists have not advanced one step in devising means for carrying into execution the dissociation of elements or transmutation of metals, beyond the knowledge that it will require intense temperature.

The Heating Power of Hydrogen.

As the result of enquiries I have made, and experiments I have witnessed, in the process of making gas from superheated steam and petroleum, in which the superheated steam is made to give up its oxygen during its passage through red-hot iron tubes and then through coke and iron scraps, thus producing hydrogen gas, subsequently combined with petroleum to give it illuminating power, I have ascertained that the cost of the hydrogen is not more than about four pence per 1,000 feet. It occurs to me that this fact can be utilized in the reduction of metals by employing the hydrogen thus produced as a heating power in furnaces constructed to admit of such use. If consumed as fast as it is made, the danger from storing it would be avoided. Forty years ago I had a narrow escape for my life while experimenting with this gas, and retain a respectful admiration of its power. One ton of coal will now raise as much steam as 60 years ago it took 10 tons to produce, the gain being due to the more scientific employment of the fuel; but the waste of heat is still so great that its utilization is a matter of world-wide importance. In no process is the waste so enormous as in the reduction of metals, especially of the precious metals, producing great losses by excessive volatilization and the mechanical dispersion of the finer particles. I have long thought that defects of this character could be avoided; and when Mr. Probert first went out for the Richmond company I asked his especial attention to the subject of improving the furnaces, which at that time were distributing metallic dust rich in gold all around the works; he has reduced this loss to a great extent, but I believe there is still great room for improvement, and I think it will be in the direction of supplying the oxygen necessary, by other means than the blast of air, and by the use of hydrogen as the chief heating medium.—*Cor. London Mining Journal.*

Proposed Material for Standard Weights.

It is proposed by Herr F. Mohr in the *Annalen der Chemie* that glass containing a large portion of silica shall be employed as the material for weights and measures. He remarks that the only men of science who work with good balances and accurate weights are the chemists; and yet, hitherto, none, even of that class, has considered it necessary in his weighing operations to consult the barometer and the thermometer, except as regards the gases. In one and the same set of weights are to be found pieces of brass or of platinum, and the same weights are used in Munich, at the hight of 1,700 feet, and in London, at slight elevations above the sea level. Against the consequences of these fallacies the best weights are no protection, and we may say that this source of error has been neglected in all chemical discoveries. We must easily see that it is unjustifiable to weigh finer than to milligrammes in all cases where a platinum crucible is concerned, or the ash of a filter, or glass vessels holding a considerable volume of air, or precipitates not absolutely insoluble. Rarely is the substance weighed which we are in search of, as silica or alumina, but it is generally calculated from some compound, and this introduces the further uncertainty of the atomic weights which are brought to a round number, as in case of phosphorus, sodium, calcium, magnesium, etc. It may be said that the whole structure of organic chemistry has been erected with a false atomic weight from carbon, which is even yet uncertain. A fall of the barometer of 10 mm., which may occur in one day, will render a kilo. weight of rock crystal lighter by 5.3 m. grammes. What is the use, therefore, of adjusting a standard kilo. to the decimal of a milligramme if the haromcter and the thermometer can bring about such changes? Weights of cystal and of platinum are not commensurable unless the atmespheric pressure is taken into account.

To Indicate Dangerous Accumulations of Fire Damp.—One of the most interesting attempts to indicate dangerous accumulations of fire damp is an apparatus devised by a Frenchman, J. Cequillion, which he calls a *grisoumeter*, the action of which is based upon the decomposition of hydrocarbens by a red-hot palladium wire, in presence of steam. This reaction he used for the analysis of the air of a mine. He has now found that he can replace the palladium by platinum, by the use of which the disadvantage that the Plante pile cannot be employed, is overcome. Recent researches of M. Coquillion have shown that the bicarbide of hydrogen detonates more violently than the monocarbide, that palladium produces a smaller detonation than the platinum, and that both metals can burn small quantities of gas. M. Coquillion has accordingly replaced the former by the latter metal in his portable apparatus.

Conductivity of Heat.—Some recent investigations concerning the coefficient of conduction for heat of various building materials, excluding the influence of radiation, and making measurements by means of the thermo-electric multiplier, show that stones are much better conductors of heat when wet than when dry, and that various classes of them, such as marble, sandstone, granite, etc., have approximately the same coefficients of conduction, while dry bricks of all kinds are much worse conductors than the natural stones.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 9.		Week Ending Jan. 16.		Week Ending Jan. 23.		Week Ending Jan. 30.	
Alpha	11¾	10½	12⅞	11¾	15	12½	15¾	14
Alta	5⅝	5	8	6¾	8½	7½	8⅝	7⅞
Andes	65c	50c	....	....	60c	45c	50c	45c
Alps	....	....	....	....	....	....	....	....
Argenta	2.65	2.60	1.35	50c	60c	80c	70c	60c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1.40	1¼	2	1½	1½	1½	1½	1.20
Belcher	4.30	3.80	4.90	4¼	5½	4.40	6	4¾
Belmont	60c	....	60c	50c	60c	50c	70c	55c
Best & Belcher	18¾	17⅞	24½	19½	22¾	21½	22	21¼
Bullion	7	5½	8½	6½	9	7¼	8½	7⅞
Bechtel	60c	50c	60c	50c	1	75c	75c	....
Belle Isle	70c	....	20c	....	20c	....	20c	15c
Bodie	9	7¾	9¾	8½	9	7¾	8	7½
Benton	3½	3	4½	3.20	4.90	4½	6¾	4¾
Bulwer	15	10	15	14	15	14	14¾	14½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	30c	10c	60c	50c	75c	70c	75c	....
Belvidere	60c	....	60c	....	70c	50c	50c	....
Booker	50c	45c	40c	....	30c	25c	40c	30c
Caledonia	2.95	2.40	3.20	2⅝	3.20	3	3	2.80
California	11½	10⅝	11½	9⅝	9⅝	9¼	9⅝	9⅝
Challenge	2	1½	2.95	2.40	3.05	2½	3.10	2⅝
Chollar-Potosi	46	41½	52	44½	50½	47	48½	46
Comanche	....	....	....	....	....	....	....	....
Confidence	10⅝	9	15	12½	17	14½	17½	15¾
Con Imperial	85c	75c	95c	75c	1.15	95c	1.10	1.05
Con Virginia	9⅞	8½	8¾	7½	8⅝	7⅞	8½	7
Crown Point	3.90	3.60	5¼	3.95	6	5	5⅝	5½
Con Washoe	3.10	2.10	2.10	....	....	....	....	....
Champion	....	....	40c	10c	40c	....	....	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	....	....	....	15c	5c	10c	5c
Daney	....	....	....	....	....	....	....	....
Day	25c	....	25c	....	30c	20c	25c	20c
Eureka Con	32½	31	31¾	26¾	29	26	27½	26½
Exchequer	5⅛	4½	5⅜	4¾	6⅜	5⅜	6⅜	5⅝
Endowment	....	....	35c	30c	30c	25c	25c	15c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	7½	5⅜	5½	4	6⅜	3.90	4½	4.05
Gila	25c	15c	....	....	20c	15c	5c	....
Golden Chariot	....	....	....	....	....	....	25c	....
Golden Terra	5¾	....	5	....	....	....	6	....
Goodshaw	40c	30c	35c	30c	35c	30c	30c	25c
Gould & Curry	11⅝	9½	16¾	10⅞	14⅝	13½	14½	12¾
Hale & Norcross	14¾	12½	20	14½	18¾	16½	16½	16¼
Hillside	2.10	2	2.10	....	....	....	2	1.95
Highbridge	2.45	2⅛	2.05	1¾	1.80	1.55	1.65	1¼
Homestake	....	....	....	....	....	....	....	....
Hussey	30c	15c	15c	....	20c	....	20c	15c
Independence	1.10	1.05	1.30	1.05	1¾	1.40	1.80	1⅛
Julia	4.15	3½	3.90	3.40	4½	3.45	3.90	3¾
Justice	4¾	3.90	4¾	3.90	4½	4	4½	4
Jackson	9	7¾	7½	....	7½	7	7½	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4.85	3.95	5¾	4¾	8	5½	6⅜	5½
Kossuth	50c	20c	20c	....	20c	15c	40c	20c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	75c	50c	75c	55c	75c	60c	75c	60c
Lady Wash	1½	65c	1.30	1.20	1½	1	2½	1½
Leopard	50c	....	....	....	70c	30c	50c	25c
Leviathan	65c	50c	55c	50c	1	55c	70c	45c
Leeds	1	....	1.10	1	1.10	1	1	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	60c	50c
Modoc	60c	50c	50c	....	60c	50c	60c	50c
Manhattan	4½	4	4½	3.35	3¾	3½	3.60	3½
Martin White	4½	4	4	....	5½	5	5	4¾
McClinton	40c	25c	40c	25c	50c	25c	60c	35c
Meadow Valley	20c	....	20c	....	....	....	....	....
Mexican	33	30½	34	29¾	34¾	32½	38¾	34½
Mides	....	....	....	....	1½	....	....	....
Morning Star	....	....	3	2¾	3½	3	3½	....
North Con Virginia	6¾	5½	7¾	5¾	7½	5½	7½	6
New York	90c	75c	75c	65c	75c	70c	1	65c
Northern Belle	9¾	8½	8¼	7¾	7	6	7	6½
New Coso	....	....	20c	....	....	....	....	....
Navajo	45c	35c	45c	35c	35c	25c	35c	25c
Occidental	....	....	1	80c	1	50c	1	60c
Ophir	35¾	33	36½	31	35½	33½	35½	33½
Oriental	1½	80c	70c	50c	50c	....	50c	....
Overman	10	9⅜	11¾	9¾	12½	10⅝	11	10½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	25c	50c	40c	45c	25c	50c	35c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	5	8¼	7	7	5¾	8	6¾
Richer	....	....	....	....	75c	....	50c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13¾	10⅞	16	13¼	16	14	14⅝	13⅜
Seg Belcher	20	....	21	20	23	20	22	....
Sierra Nevada	43	41	56	42	49½	44	49½	46¾
Silver Hill	2¼	1.40	1¾	1.55	2.40	1.70	2.30	2
Silver King	....	....	....	....	....	....	7	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	30c	20c	50c	20c	1½	50	1½	75c
Summit	1½	1¼	2¼	1.60	2¼	1½	2	1½
Scorpion	....	....	1.60	55c	1½	1½	1.45	1
Solid Silver	50c	....	1.80	50c	1	70c	65c	50c
South Bodie	25c	....	....	....	25c	20c	25c	....
South Standard	....	....	10c	....	....	....	....	....
Star	50c	....	50c	....	80c	....	60c	....
St. Louis	....	....	70c	30c	55c	40c	70c	55c
Syndicate	....	....	....	....	85c	....	....	....
Tioga Con	1.20	1	1.60	1½	1.70	1½	1½	1.30
Tiptop	1.30	1¼	1.20	1	1.20	1	1.20	....
Trojan	60c	30c	50c	....	50c	40c	45c	40c
Union Con	58½	56	63	56¾	60½	50	63	59
Utah	13¾	11¼	22	13¾	18¾	16½	19½	17½
Vermont Con	....	....	....	....	....	....	....	....
Ward	75c	70c	75c	65c	95c	75c	85c	75c
Wells-Fargo	20c	15c	20c	....	20c	15c	20c	15c
Woodville	....	....	50c	20c	50c	35c	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16½	13¾	20	16½	22¾	19	21	19½

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 24.

250 Alta 7⅞@6
450 Alpha 14@14¼
290 Andes 50@45c
165 Best & Belcher 21¾@21½
1535 Bullion 8⅝@8
265 Belcher 4¾
240 Benton 4¾@4.80
470 Con Virginia 7⅞
1125 California 9½@9⅝
30 Chollar 47¼
55 Crown Point 5¼
1855 Con Imperial 1.10@1.05
200 Caledonia 3
150 Confidence 16@16¼
325 Challenge 2⅝@2.65
1795 Exchequer 6
435 Gould & Curry 13⅝@13¼
400 Geo Douglas 55@50c
320 Hale & Nor 16¾@17
130 Justice 4.20@4¼
995 Julia 3½
110 Kentuck 6@5⅞
200 Kossuth 20c
120 Lady Wash 1¼@1.30
400 Lady Bryan 70@65c
1400 Leviathan 70@45c
700 Mexican 34½@35
50 Mt Hood 30c
255 North Con Vir 6¼@6
625 N Bonanza 1.40
650 New York 70@65c
245 Overman 10⅞@10⅞
400 Ophir 35@33¾
500 Phil Sheridan 35c
390 Sierra Nevada 47½@46¾
555 Savage 14⅛@13⅞
805 Silver Hill 2¼@2.30
650 Solid Silver 65c
10 St Louis 65c
240 Succor 1.10@1½
100 Scorpion 1½
900 Trojan 40@45c
145 Union Con 59@59¾
125 Utah 18
500 Wells-Fargo 20c
760 Ward 80c
560 Yellow Jacket 19¾@19⅝

AFTERNOON SESSION.

1235 Argenta 70@60c
70 Bechtel 75c
90 Bodie 8@7⅞
330 Belmont 55@60c
800 Booker 40@30c
250 Caledonia (B H) 95c@1
90 C Pacific 1½
300 Dudley 1
100 Day 25c
500 DeFrees 10c
110 Eureka Con 27@26½
300 Endowment 20c
700 Grand Prize 4½@4.20
870 Hussey 15@20c
190 Highbridge 1½@1.65
1230 Independence 1.60@1.80
300 Jackson 7
175 Leopard 25c
100 Leeds 1
140 McClinton 55c
140 Manhattan 3.60@3½
500 Modoc 60@55c
400 Navajo 30c
50 Northern Belle 7
415 Oriental 50c
450 Paradise 2.90
80 Raymond & Ely 6¾
200 Star 60c
250 Summit 1½
600 S Bulwer 60@70c
40 Silver King 7
500 Tuscarora 5c
10 Tioga Con 1.30
100 Tiptop 1.20

Saturday A.M., Jan. 25.

155 Alpha 14@14½
200 Alta 7¾@7⅞
350 Albion 55@50c
920 Argenta 60@65c
1320 Belmont 55@60c
50 Belle Isle 15c
295 Best & Belcher 21¼@21½
350 Bullion 8¼
1220 Belcher 5@5½
650 Booker 35@30c
235 Bodie 7¾@8
200 Baltimore Con 1½
970 Benton 4.80@4¾
240 Con Virginia 8
460 California 9⅝@9½
90 Confidence 16½@16¾
45 Chollar 47@46¾
305 Crown Point 5⅜@5½
905 Con Imperial 1.05
1015 Challenge 2⅝@2.80
325 Caledonia 3@2.90
100 Con Pacific 1½
900 Exchequer 6¼@6
15 Eureka Con 27@27½
1450 Endowment 25@20c
630 Gould & Curry 13@12¾
1170 Grand Prize 4.15@4.05
100 Geo Douglas 60c
285 H & Norcross 16½@16¾
200 Hussey 15c
410 Highbridge 1½
325 Independence 1.55@1½
280 Justice 4.10@4.05
540 Julia 3½@3.55
10 Jackson 7
130 Kentuck 5¾@5⅝
50 Kossuth 25c
1190 Leviathan 60@65c
340 L Bryan 60@75c
60 Leopard 50@45c
120 Lady Wash 1½@1.30
140 Mexican 35@35½
10 Manhattan 3.60
250 McClinton 60@55c
25 Martin White 4¾
120 N Con Virginia 6¾@6½
120 New York 65@70c
400 N Bonanza 1.40@1.45
250 N Sierra Nevada 10c
430 Navajo 30@25c
185 Ophir 33½@33¾
190 Overman 10⅞@10½
320 Phil Sheridan 35@40c
335 Paradise 2.90
160 Raymond & E 6¾@7
330 Savage 13½@13¼
250 Succor 1.10@1.05
180 Sierra Nevada 47@47½
505 Silver Hill 2.10@2.05
575 Solid Silver 50@55c
100 St Louis 70c
100 S Bodie 25c
100 Summit 1.60
700 S Bulwer 60c
100 Tioga Con 1.35
80 Union Con 59¾
80 Utah 18@17½
200 Ward 80c
460 Yellow Jacket 19½@19¾

Monday A. M., Jan. 27.

285 Alta 8@7⅞
140 Alpha 14@14½
100 Andes 45c
320 Best & Belcher 21¾
200 Baltimore Con 1½
1505 Belcher 5⅜@5⅝
615 Bullion 8⅝
660 Benton 4¾@4.85
945 California 9½@9⅝
610 Con Virginia 8@8⅛
240 Crown Point 5⅜@5⅝
1525 Con Imperial 1.10
20 Chollar 46½
2100 Challenge 3@2.95
160 Caledonia 2.95@2⅞
160 Confidence 16¾
1345 Exchequer 6½@6⅜
545 Gould & Curry 13½@13⅛
50 Geo Douglas 50c
210 Hale & Nor 16
550 Justice 4¼@4.05
1010 Julia 3.55@3.60
35 Kentuck 5½
100 Kossuth 40c
400 Lady Bryan 65@60c
1300 Leviathan 65@60c
390 Lady Wash 1.40@1½
1355 Mexican 37½@38½
550 N Sierra Nevada 10c
225 North Con Vir 6¾@6⅝
700 N Bonanza 1.40@1½
10 New York 65c
230 Ophir 34½@35
320 Overman 10¾@11
2150 Phil Sheridan 50@45c
2050 Solid Silver 50c
540 Savage 13⅝@13½
690 Sierra Nevada 49@49½
680 Silver Hill 2.30@2.20
150 St Louis 65@60c
650 Succor 1@1.10
100 Scorpion 1.45
180 Utah 19@19½
120 Union Con 63@62½
1020 Ward 80@85c
400 Yellow Jacket 20½@20½

AFTERNOON SESSION.

460 Argenta 70c
980 Belmont 70c
260 Bodie 7¾@8
45 Bechtel 75c
350 Booker 30c
1800 Belle Isle 15@20c
350 Black Hawk 75c
300 Dudley 1.10
100 DeFrees 5c
10 Eureka Con 27
2400 Endowment 20c
300 Golden Chariot 20c
50 Golden Terra 6
1170 Grand Prize 4½@4¼
100 Goodshaw 30c
300 Gila 5c
100 Hillside 2
200 Highbridge 1½@1.30
620 Independence 1.70@1.60
100 Leeds 1
100 Leopard 30c
10 Martin White 5
110 Manhattan 3½@3.60
145 Mono 1.65@1.70
70 Modoc 55c
320 McClinton 55@50c
220 Northern Belle 7@6⅞
100 Navajo 30c
200 Oriental 50c
345 Paradise 2.90@2.80
450 Raymond & Ely 7@8
1350 S Bulwer 65@60c
400 Summit 1.60@1.65
200 Star 60c
90 Tioga Con 1.35

Tuesday A.M., Jan. 28.

470 Alpha 15@15⅝
195 Alta 8@7¾
50 Andes 50c
445 Best & Belcher 22
870 Belcher 5¾@5⅞
1030 Bullion 8⅝@8½
905 Benton 4¾@5
400 Baltimore Con 1½
685 California 9½@9⅝
240 Caledonia 2.80@2.85
1020 Con Virginia 6⅞@8½
625 Con Imperial 1.10@1.05
90 Chollar 48½@48
595 Crown Point 5¾@5⅝
160 Confidence 17¼@17
1205 Challenge 3.05@3.10
110 Dardanelles 3
975 Exchequer 6¼@5½
500 Flowery 30c
695 Gould & Curry 14@14½
100 Geo Douglas 70c
1025 H & Norcross 17¾@18½
320 Justice 4
185 Julia 3¾@3.90
270 Kentuck 6@6⅜
450 Kossuth 20c
1070 Lady Bryan 60c
40 Lady Wash 1½
550 Leviathan 65@55c
210 Mexican 39@38¾
100 Morning Star 3½
250 New York 70c
290 North Con Vir 6½@6¾
1120 N Bonanza 1.60@1½
200 N Sierra Nevada 10c
185 Ophir 35½
260 Overman 10⅞@10⅝
15 Occidental 60c
1250 Phil Sheridan 45c
200 Plutus 1.40
195 Sierra Nevada 49½@49
225 Savage 14⅝@14¼
25 Seg Belcher 22
825 Silver Hill 2.10@2
100 Succor 1.10
180 Santiago 1.65
100 St Louis 60c
20 Scorpion 1½
1465 Solid Silver 50c
400 Trojan 45c
110 Utah 19
180 Union Con 61
500 Wells-Fargo 15c
900 Ward 80@85c
525 Yellow Jacket 21@20½

AFTERNOON SESSION.

1440 Argenta 70c
100 Albion 30c
430 Bodie 7¾@7⅞
250 Booker 30c
1000 Belmont 70c
165 Bechtel 75c
50 Belvidere 50c
650 Belle Isle 20c
150 Dudley 1¼@1.20
295 Day 20c
750 DeFrees 10c
900 Endowment 15c
425 Eureka Con 27@27½
60 Goodshaw 25c
755 Grand Prize 4½
600 Golden Terra 5½
645 Hussey 15@20c
100 Highbridge 1.35
15 Hillside 2
50 Hamburg 1½
70 Independence 1.70
410 Jackson 7½
300 Leopard 45c
510 Mono 1½
100 Modoc 60c
100 McClinton 35c
50 May Belle 50c
20 Northern Belle 6⅝
450 Navajo 30@35c
200 Oriental 50c
580 Paradise 2½@2.60
100 Real del Monte 1½
430 Raymond & Ely 7½
10 Richer 50c
700 Summit 2
700 S Bulwer 55@60c
100 Tioga Con 1.40

Wed'sday A.M., Jan. 29.

70 Alpha 14⅝@14½
85 Alta 8
125 B & B 21¾@21½
690 Bullion 7¾@8
500 Baltimore Con 1¼@1.30
845 Belcher 5⅝@5⅝
860 Benton 5½@6⅜
20 Chollar 46@46½
155 Con Virginia 8⅜@8½
815 California 9½@9⅝
220 Crown Point 5½@5⅝
195 Caledonia 2.80
800 Con Imperial 1.05
195 Confidence 16½
1955 Challenge 3
350 Dardanelles 3⅛@3.20
1420 Exchequer 5⅝@6½
100 Flowery 40c
560 Gould & Curry 13½@13⅝
150 Geo Douglas 60c
525 Hale & Nor 17¾@17
555 Justice 4
225 Julia 3⅝@3.60
100 Kentuck 5⅝@5¾
350 Kossuth 20c
250 Leviathan 60c
450 Lady Bryan 60c
280 Lady Wash 1½
315 Mexican 37@36½
100 Morning Star 3¼
630 North Con Vir 6¾@7
20 New York 70c
1525 N Bonanza 1½@2
100 Occidental 1
120 Overman 10½@10¼
125 Ophir 34@33¾
330 Plutus 1¼@1.30
1445 Phil Sheridan 40@30c
50 Succor 1
270 Savage 13½@13⅝
365 S Nevada 48@47
500 Santiago 1.55@1.60
150 Scorpion 1½
1100 Solid Silver 50c
50 St Louis 55c
475 Silver Hill 1.90
675 Trojan 45c
5 Utah 18½
300 Union 60@59¾
1010 Ward 75c
465 Yellow Jacket 19¾@19⅝

AFTERNOON SESSION.

450 Albion 50c
630 Argenta 70@65c
1650 Belmont 70@65c
240 Bulwer 14¾@14½
50 Bechtel 75c
1500 Belle Isle 20c
125 Bodie 7⅝@7½
1000 Booker 35c
150 C Pacific 1½
250 Chieftain 50c
745 Dudley 1¼
800 DeFrees 10c
300 Day 20c
65 Eureka Con 27½
1350 Endowment 15c
320 Grand Prize 4⅝@1.40
505 Goodshaw 30c
170 Hillside 2@1.95
260 Highbridge 1½
855 Hussey 15@20c
410 Independence 1½@1.70
185 Jackson 7½@7¼
40 Leopard 35c
770 Modoc 55@50c
160 Manhattan 3½
200 McClinton 40c
40 M White 5
1140 Mono 1½
50 May Belle 60c
220 Northern Belle 6½
25 Navajo 35c
300 Oriental 50c
3025 Paradise 2.60@2½
150 Real del Monte 1½
220 Raymond & Ely 7
590 Summit 2
395 S Bulwer 55@60c
60 Tioga Con 1.45@1½

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Jan. 23.

200 Alta 8¼@8⅜
820 Alpha 14¾@15
200 Andes 45@50c
250 Best & Belcher 22
640 Bullion 8¼@8¾
280 Belcher 4¾@4.80
200 Baltimore Con 1½
1100 Benton 4.85@4.90
340 Caledonia 3.05@3.10
1250 Con Imperial 1.10@1.15
160 California 9⅝
240 Challenge 2.60@2¾
360 Con Virginia 7¾@6
875 Confidence 16⅞@17
40 Chollar 49
290 Crown Point 5⅜@5¾
1365 Exchequer 6¼@6⅜
480 Gould & Curry 13⅝@13¾
100 Geo Douglas 50c
325 Hale & Nor 17¼@17¾
160 Justice 4.30
905 Julia 3.80@3.85
150 Kentuck 6
100 Kossuth 20c
70 Lady Wash 1¼
700 L Bryan 75@70c
1050 Leviathan 70@75c
260 Mexican 34½@34¾
480 Mides 1¼
300 New York 75c
195 N Con Virginia 6@6¼
400 N Sierra Nevada 5c
200 N Bonanza 1½@1.45
80 Ophir 34¾
250 Overman 10⅞@11
1960 Phil Sheridan 25@30c
590 Sierra Nevada 46½@47½
1010 Savage 14⅝@14¾
40 Seg Belcher 23
750 Silver Hill 2.35@2.40
500 Succor 1.40@1½
800 Sutro 20c
30 Scorpion 1½
450 Solid Silver 70@75c
50 St Louis 55c
240 Utah 18¼@16½
75 Union 59½
340 Wells-Fargo 20@15c
760 Ward 85@80c
1120 Yellow Jacket 20½@20½

AFTERNOON SESSION.

1330 Argenta 70@75c
750 Belmont 60@65c
700 Belle Isle 20c
230 Bodie 7½@8
100 Black Hawk 65c
400 Booker 40@50c
75 C Pacific 1½
100 Day 1
500 Endowment 25c
15 Eureka Con 27@27½
600 Grand Prize 4.15@4¼
100 Golden Chariot 20c
300 Goodshaw 30c
200 Hussey 15c
1100 Highbridge 1¾@1.70
120 Hillside 1.90@2
200 Independence 1.40
50 Leeds 1
335 Leopard 25@30c
180 Modoc 60c
125 Martin White 5
180 Mono 1.65@1¾
400 McClinton 35@40c
10 Manhattan 3.60
265 Northern Belle 6½
170 Navajo 25@30c
650 Oriental 50c
815 Paradise 3@3½

Thursd'y A. M., Jan. 30.

245 Alpha 14⅝@15
635 Alta 8¼@6⅜
100 Andes 45@50c
335 Best & Belcher 21¾@22
615 Belcher 5⅝@6
950 Bullion 8½
2390 Benton 5½@6
200 Baltimore Con 1.20
140 California 9½@9⅝
485 Con Virginia 8½@8⅝
225 Crown Point 5⅝@5¾
30 Chollar 47
2795 Con Imperial 1.05@1.10
370 Confidence 15¾
530 Caledonia 2.90
150 Challenge 3
490 Dardenelles 3½
985 Exchequer 6@6⅛
1410 Flowery 45@50c
330 Gould & Curry 13½@13⅝
100 Geo Douglas 55c
295 Hale & Nor 17@17¼
330 Justice 4@4.10
825 Julia 3.65@3.70
140 Kentuck 6@6½
1050 Kossuth 20c
75 Lady Wash 2½@2½
955 Lady Bryan 75@70c
440 Leviathan 60c
390 Mexican 38@38½
1220 New York 95c@1
395 North Con Vir 7¼
500 N Sierra Nevada 10c
2070 N Bonanza 2¼@2.45
320 Ophir 34¾@35
175 Overman 10⅝@10¾
4200 Phil Sheridan 30@40c
920 Sierra Nevada 48½@49
420 Savage 13¾@14
280 Succor 75@90c
895 Silver Hill 2.05@2.15
25 Scorpion 1
970 Solid Silver 55c
1025 Trojan 40@45c
470 Union Con 60@61
240 Utah 16⅞@19
370 Ward 75@80c
380 Yellow Jacket 20@20¼

AFTERNOON SESSION.

650 Argenta 60c
310 Bulwer 14¾
355 Bodie 7½@7¾
70 Bechtel 75c
950 Belmont 75@60c
540 Belle Isle 20c
950 Booker 30c
130 Belvidere 50@55c
125 C Pacific 1.35@1.40
225 Dudley 1.35@1.40
200 DeFrees 10c
175 Eureka Con 26¾@27
2150 Endowment 15c
200 Gila 5c
200 Goodshaw 35@30c
470 Grand Prize 4.45@4½
525 Hussey 15c
700 Highbridge 1½@1.60
115 Hillside 2
790 Independence 1½@1.55
110 Jackson 7@7½
400 Leopard 25@30c
100 Leeds 60@90c
60 Martin White 5
150 May Belle 50@55c
235 Mono 1½
20 Manhattan 3½
100 McClinton 40c
925 Navajo 35c
300 Northern Belle 6@6½
1500 Paradise 2½
245 Real Del Monte 1½
470 Raymond & Ely 5¾@6
305 Summit 1.90@2
50 Star 65c
1850 S Bulwer 50@60c
140 Tioga Con 1½

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	13	1 00	Dec 10	Jan 13	Jan 31	W H Watson	302 Montgomery st
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belmont M Co	Nevada	19	50	Nov 27	Jan 3	Jan 27	J W Pew	310 Pine st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Benton Con M Co	Nevada	1	50	Dec 11	Jan 15	Feb 3	W H Watson	302 Montgomery st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Crown Point G & S M Co	Nevada	36	1 00	Dec 12	Jan 16	Feb 6	James Newlands	203 Bush st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E O Masten	309 Montgomery st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hale & Norcross S M Co	Nevada	60	50	Dec 10	Jan 15	Feb 7	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel'	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
Mayhelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Mono G M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Feb 3	Mar 3	J L Fields	240 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	G R Spinney	310 Pine st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 24	Feb 13	W H Lent	327 Pine st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance M Co	California	2	50	Dec 19	Jan 28	Feb 21	B Lengley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Arizona S M Co	Nevada	4	1 00	Dec 9	Jan 13	Feb 3	W Willis	309 Montgomery st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Feb 25	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Catawba M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Bruut	318 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Mar 13	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N C Walton	324 Pine st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	316 Pine st
Mariposa Land & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower M Co	California	2	15	Dec 7	Jan 4	Feb 4	J Morizio	328 Montgomery st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	24 Safe Deposit Build
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 5	J Penteeost	511 California st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Mar 24	S F Monroe	419 California st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	6	05	Nov 19	Jan 6	Feb 4	J W Clark	318 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Almaden Quicksilver M Co	California	John F Mahony	207 Sansome st	Annual	Feb 10
Cherokee Flat Blue G M Co	California	R N Van Brunt	318 Pine st	Annual	Feb 1
Equitable Tunnel & M Co	Utah	Chas J Collins	227 Montgomery st	Special	Jan 31
Father de Smet Con G M Co	Dakota	Theo Widman	404 Montgomery st	Annual	Feb 6
Magalia G M Co	Nevada	T A White	113 Leidesdorff st	Special	Feb 10
Manhattan S M Co	Nevada	John Crocket	203 Bush st	Annual	Feb 5
North Con Virginia M Co	Nevada	G C Pratt	309 Mongomery st	Annual	Feb 5
Northern King M & M Co	Nevada	G F Glover	318 Pine st	Special	Feb 13
Telfair M Co	Nevada	J Pentecost	331 Montgomery st	Annual	Feb 11
United States Con G & S M Co	California	M C Southard	523 Kearny st	Special	Feb 1
Union Flag G & S M Co	Nevada	W H Allen	419 California st	Annual	Feb 13

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Jan 13

Pacific Board—Latest Sales.

Wed'sday A.M., Jan. 29.

20 Alpha 14¾
40 Alta 8½@8¼
160 Belcher 5⅝@6.65
210 Best & Belcher 21¾
220 Bullion 8½
80 Benton 5¾
15 Con Virginia 8½
1000 Con Imperial 1.10
30 Chollar 46½
80 Crown Point 5.55@5.60
160 Caledonia 2.9 @2.85
185 Exchequer 6¼@6
140 Gould & Curry 13½
95 Hale & Nor 17¼@17⅝
60 Justice 4
25 Julia 3½@3.55
60 Kentuck [illegible]
180 Mexican 37@37¼
260 Ophir 33¾@34
20 Overman 10½
250 Savage 13¼@13⅝
305 Sierra Nevada 48
820 Silver Hill 2@1¾
25 Union Con 61
10 Utah 18½
25 Yellow Jacket 19¾@19½

AFTERNOON SESSION.

50 Alta 8½@8¾
765 Belcher 5⅝@6
5 Best & Belcher 21
20 Benton 6¼@6¼
60 Crown Point 5⅝@5. 65
170 Con Virginia 8⅝@8¾
125 Caledonia 2. 90
20 California 9½
100 Con Imperial 1.05
180 Exchequer 6¼@6.10
1800 Flowery 45@40c
200 Geo Douglas 50c
20 Hale & Nor 16½
10 Justice 4.05
30 Julia 3.60@3.55
100 Mackey 2⅝
80 Mexican 37½
150 North Con Vir 6¼@6⅜
405 N Bonanza 2¼@2.70
600 New York 90@95c
30 Overman 10½
5 Ophir 33¾
500 Phil Sheridan 33@35c
100 Ray'd & Ely 7½
200 S Utah 5c
400 St Louis 65@70c
150 Solid Silver 45c
60 Savage 13¼@13½
700 Succor 1.05
200 S Bulwer 65c
25 Sierra Nevada 48@48½
500 Santiago 1.65@1½
270 Silver Hill 2@2.10
130 Ward 80c
20 Yellow Jacket 16¾

California Board—Latest Sales.

Wed'sday A.M., Jan. 29.

40 Alpha 4
40 Alta 7⅞@8
300 Alpine 55c
700 Ætna 2c
500 Atlas 17c
375 Atlanta 5@11c
20 Best & Belcher 22
110 Belcher 5⅞@5½
40 Bullion 8
50 California 9½
60 Con Virginia 8¾@8½
420 Con Imperial 1.05@1.07
50 Crown Point 5½
60 Exchequer 6
100 Favorite 60c
45 Gould & Curry 13¾
50 Hale & Norcross 17½
40 Justice 4
50 Julia 3.60
200 Lady Bryan 60c
50 Mexican 37
100 Mackey 2½
100 N Union 20c
200 North Carson 18c
630 N Sierra Nevada 10@8c
40 Ophir 35
50 Rock Island 8c
45 Savage 13
200 Santiago 1.0
120 Silver Hill ....
100 Trojan 45
50 Woodville 35c
40 Yellow Jacket [illegible]

AFTERNOON SESSION.

260 Alpha 14¼@14½
500 Ætna 2c
00 Atlas 10c
160 Alta 8¼@8½
160 Alexander 6
00 Almaden Q 70c
45 Bullion 8½
40 Best & Belcher 21¾
365 Belcher 5.70@5½
00 Black Hawk 80c
40 Con Virginia 8½
340 Crown Point 5.60
00 Con Imperial 1.10@1.05
160 California 9¾@9½
730 Caledonia 2⅞
150 Coso Con 5c
00 Dayton 19c
340 Exchequer 6½
00 Enterprise 1½
45 Gould & Curry 13⅝
60 Hale & Nor 16

70	Julia	3¦@3.55	
55	Justice	4.05	
30	Mexican	.37	
110	Mackey	2¼	
100	New York	.80@85c	
100	New Cosa	15c	
40	Ophir	.34	
40	Savage	13½	
20	Sierra Nevada	.48	
70	Silver Hill	2.05	
1000	S Utah	.8c	
600	Twin Peaks	2½@3c	
200	Wales	1¼	
40	Yellow Jacket	12½	

Mining Share Market.

Ths mining share market during the past week has been devoid of general interest. No strong feature has been developed, nor has any movement calling for special comment occurred. A dearth of orders from what are snpposed to be the controlling powers, suppressed all enthusiasm, and lead outsiders to realize freely when opportunity offered. As a consequence, transactions were comparatively few and limited, and prices held to a low range. The hope of early developments on the Comstock belt serves to keep alive confidence, but fails to enthuse the street. The prospect sustains the market, but gives it no positive strength. With life so kept in it, only a little in the way of new ore finds would be required to render the market buoyant, and perhaps "booming." Until then it will probably remain fitful and spiritless, fluctuating only over a narrow margin. The long impending conflict between Mr. Sutro and the Comstock companies seems about to be precipitated. New issues and complications have lately arisen between these parties, which will now, most likely, have to be settled in the courts.

Bullion Shipments.

Since our last issue shipments of bullion have been as follows: Tybo Con., Jan. 17th, $4,064.60; Argenta, Jan. 19th, $5,847.38; Tybo Con., Jan. 20th, $4,087.41; Christy, Jan. 26th, $7,327; Con. Virginia, Jan. 25th, $17,793.53; Trojan, Jan. 22d, $6,860.48; Alexander, Jan. 27th, $6,163; Tybo Con., Jan. 23d, $3,986.99; Tybo Con., Jan. 24th, $3,923.55; California, Jan. 25th, $101,797.54; Bodie, Jan. 22d, $11,414.37; Standard, Jan, 23d, $17,985.53; Northern Belle, Jan. 22d, $2,631.69; Trojan, Jan. 22d, $6,880.30; Paradise Valley, Jan. 23d, $3,334; Paradise Valley, Jan. 24th, $3,315.78; Grand Prize, Jan. 27th, $21,000; Ophir, Jan. 24th, $24,030.96.

Leaching at the Silver Peak Mine.—The shipment of bullion from the Silver Peak mine, Esmeralda county, Nevada, for 1878, was $112,417.63. Of this, $21,106.90 was from the old amalgamating work's mill to April 3d. The remainder, $91,310.73, was from the new chloride leachiug mill, six and a half months' run. These works are under the superintendence of Mr. D. W. Bruntou, who has introduced an improved and extremely simple system of leaching. Hs is also nsing an improved form of fnrnace which has been very successful, and for which he has applied for Letters Patent.

Hymenial.—We acknowledge with pleasure the receipts of cards of invitation to the marriage of Miss Nina Evans, daughter of A. H. Evans, Esq., to Mr. Bartram Zevely, at Washington, D. C. Tbs ceremony was announced for January 30th, at ths Churcb of the Ascension, and has therefore already taken place. Although it be late, we tender our sincere congratulations and good wishes to the happy pair, and in this sentiment our readers and patrons will join, for Mr. Evans, the bride's father, is our agent at the national capital. May they live long and be happy.

Money.—People who can appreciate money, or wbo have learned how to acquire and to bold property, will take interest in Mr. Del Mar's able study, in this issue, of the evolution of ideas and of the words coined to express them, in tbe currencies so intimately related to tbe precious metal mining industry of the world. He shows the rationale of the word-currency of Currency, and the value that is to be attached to Value, leaving the reader to travel on himself over tbe rest of the ground of property *in propria personæ*.

The New Afterthought Mill.—Tbe Afterthought mining company, of North Cow Creek mining district, Shasta county, Cal., are putting up a new 10-stamp mill on ths site of the old one (burned last spring), and expect to havs it running by the 1st of April. The O'Harra process is to be used, which is chloridizing and leacbing. The experience in the old mill was very satisfactory, so they have no doubt it will work tbe ore to their entire satisfaction. They think they can work Meadow Lake or any other ore.

The Kendall Ore Stamp.—Oue of the Kendall ore stamps mills, wbich we recently illustrated in the Press, is running at Rough and Ready, near Grass Valley, and is said to be crushing one ton per day, giving excellent satisfaction. Another is running at Sonora, Tuolumne county, and there are three in Amador county. One has also gons to Caribou.

A cargo of Carrara marble, lost eight years ago at sea, and recently discovered, was found to be completely honey-combed by some marine boring animal.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

A Thrifty Town.—*Ledger*, Jan. 25: Amador City is growing rapidly and business of all kinds is very brisk. Everybody seems busy and money is circulating freely. The Keystone mine moves along in its career of gold production, pay-day comes with clockwork regularity.

Piping.—The work of laying the pipe from the Oneida mill to the head of the Moore mine ditch was commenced last Wednesday.

Struck Ore.—In the shaft of the Tellurium mine a veiu of orc was struck on the 20th inst., very rich in sulphurets and free gold, at about 140 feet in depth. They have had very hard rock for some time past; and have consequently made rather slow progress in sinking. The veiu seems to be widening as they go deeper.

Plymouth.—There is more work going on here than usual. Capitalists are investing their funds in the development of our mines, with the indications strongly pointing to rich returns. Lucky Baldwin, it is said, has bonded Pondstouo's mine in Big canyon for $60,000. Hoisting works are already up, and the mill is under contract, and will be rapidly built. A San Francisco company are also about to rssume work on the Central mine, on wbich work was suspended last year.

Strikes.—They have pushed a tunnel into the Thomas George claim a distance of 130 feet, and are rapidly approaching the maiu ledge, having already passed through several small veins of rich quartz. The surface has been worked for yeara by Mr. George, and has yielded handsomely of the coveted metal. Work on the Enterprise mine will, according to report, be resumed. It is also reported that rich orc has been struck in the new shaft south of the Phœnix—Hooper & Hayward's claim. If it proves true, we shall ere long have another mill turning ont bullion. Two of our pocket miners, Tripp & Smith, stumbled across a rich pocket last week, about four miles uorth of town, and took $10 to the pan. Other parties on the same range are making good wages, so that our placer diggings are uot all played ont. The Phœnix is surrendering quartz of the richest quality. A. Hayward has beeu up, and ordered the Superintendent to buy all the wood he can get, so as to insure ths continuous running of the works. A disbursement of mint-drops—double eagles—is expected this week.

CALAVERAS.

The Gwin Mine.—*Chronicle*, Jan. 25: A cousiderable stream of water was struck in the 1500 level of the Gwin mine tbia week that for a time threatened to delnge things generally. All the pumps and one bucket were kept very busy for several days in preventing the water from filling the mine. We learn, however, that the water has greatly diminished in quantity and that no further trouble is anticipated from that sourcc. A report was also in circulation bere that the 1500 level was gradually closing, but as we have been unable to trace the rumor to any authentic source it is probable that tbe truth has been greatly exaggerated. The hatteries are running as usual with fair results.

Hauling Rock from the Banner.—Another crushing of ore has been mined at the Banner mine, at Glencoe, and the work of hauling it to Garland's mill was commenced last Tuesday morning. There are 100 tons of ors on the dumps, none of it has ever yielded less than a $100 per ton.

Clean-up.—We learn tbat a partial clean-up was made at the Mammoth hydraulic, lately, the yield being great, even in excess of expectations.

New Mill.—A new 10-stamp mill has lately been put on the Garabaldi mine, located about a mile and a half below Robinson's Ferry on the Stanislaus. There is a good deal of activity bcing displayed in mining operations in the southern part of tbe county. The Morgan mine at Carson Hill is being more vigorously worked than ever, and expensive machinery has been put upon the Melones mine at Robinson's Ferry.

EL DORADO.

About Kelsey.—*Mountain Democrat*, Jan. 25: The Estrella mine is sitnated on a lode lying about a half mile east of the Gold Deposit lode, with the Doncaster and Saint Lawrence lode lying between them. All of the lodes are running nearly nortb and south, cutting the formation at an angle of about 20°. They are situated in a belt of country composed of slate and porphyry, which has been fabulously rich in placer gold, and therc is every evidence to lead one to believe that these four lodes are the sources from whicb the vast amount of gold which enriched our ravines and gulches was derived.

INYO.

New Silver Belt.—*Independent*, Jan. 18: Tbere is something of a local excitement regarding discoveries made lately in this vicinity. From the Yellow Grade mines below Cerro Gordo, there evidently extends northward a silver belt whicb includes in the same general liue tbe new mines belonging to Meysan, Hanger, Palmer and others running above Swansea. Old ledges of the same charactsr are known to exist on the mountain's side bslow Hahn's and New York peaks, and still further north above the Eclipse gold miue. Tbis brings us nearly to the south end of a well defined ledge which is traceable for more than a mile in lengtb. The Desaliar party are opening their mine, and have done sufficient to show a remarkably good "prospect," at least. A tunnel 22 feet, running with the ledge and attaining a depth of about 30 feet under the snrface, shows on top and bottom a solid, 18-inch ledge of gray carbonate orc. A specimen of this weighing some 40 pounds and assaying $400 per ton, may be found at Levy's saloon and examined by the curious. A piece of tho same weighing 92 pounds, with stratas running through it assaying from $800 to $1,000 per ton, has been sent to Bodie, and for a time will be exhibited at Cullen & McDermott's saloon. The boys have from 15 to 20 tons of such ore on the dump, and their property, for the present anyway, is not for sale. It lies in an unbroken lime formation, stands at the regulation angle into the hill, the walls being judged perfect by old miners. This ledge is situated about half way up the Inyo mountains across the valley, and some 10 miles distant from Independence. In the old days of San Carlos, Chrysopolis and Bend City operations this country referred to, above the foothill region then worked, was just beginning to be prospected when the Indians made things entirely too hot for continuous and steady work. Since tbeu the valuable mines right before our doors, as it were, have been comparatively unheard of until tbe present.

MONO.

Open Winter thus Far.—Bodie *Standard*, Jan. 25: The continued fine weather of the past week has rendered it possible for mining companies to pursue their workings without interruption, and well have they improved the opportunity. Dump piles have increased in size with remarkable rapidity, and explorations under ground have been pushed ahead with vigor and energy. Such au open winter is one of the things which surprise the oldest and most knowing inhabitant, and is said to be almost unprecedented.

The Mining Outlook.—The most confident people in Bodie are those whose duties render them most familiar with the mines. The knowledge which the reporter obtained in his rounds make him the most sanguine of all in his estimate of ths future of Bodie district. There has never been a time in the history of the camp when there was so little doubt as to its great resources as now. The stock market, which is in a sense the barometer which gauges the estimation in which mining properties are held by the public, exhibited a somewhat stronger tone during last week, the favorites being South Bulwer, Summit and Dudley. In the former we have been called upon to record a strike of the most important character. The Summit mine is and has been a great favorite with investors, and the raise has probably been caused by a general desire to "load up" with that particular stock. The Dudley is running a crosscut at 300 feet depth, of which great hopes are entertained. The stock market, after all, throws but a fitful and uncertain light upon what is really being doue. The dumps which are growing to gigantic proportions about many of our hoisting works are really better monuments of the work which is being accomplished.

Work at the Various Mines.—Mono is about to engage in an exteusive and comprehensive system of prospecting the northern portion of its own ground as well as tbs southern end of the Bodie, in which the Bodie mine will share the expense. The Red Cloud has again resumed operations, and the mine is now free from water for the first time since last August. As the east crosscut was approaching the Red Cloud vein when the water came in, and a west crosscut will at once be started for the Packard and Morton ledge, an early development in that mins is among the prospecta of the early future. The Noonday is looking remarkably well, the ledge having widened very materially since last week. Work in the main shaft of the Con. Pacific is being pushed night and day. The rock in bottom of shaft is quits hard, with streaks and hunches of quartz coming in. The shaft is now down about 200 feet, and everything is working well. In the Standard mine they have an immense amount of ore in sight. Much of tbeir richest ore is left standing, as they can extract it at any time. They can get out all the ore they cau crush while doing work for tbe exploration and development of tbe mine. They have reserves containing orc worth $2,000 per ton. The Bulwer company have over 800 tons of rich ore at the Bodie mill, and will begin crusbing as soon as water can be obtained. Work is going on as usual, except in some of the little outside mines, which are some distance out of town aud have been shut down for the winter. Business men from California are buying lots in the town of Bodie and will open places of business thereon early next spring. In the South Standard good progress has been mads in the east crosscut on the 400 level, having advanced some 70 feet through favorable-looking ledge matter. In the west crosscut, on the same level, progress has been slow, owing to extreme hardness of the rock, which is blue porphyry with occasional seams of clay. The water is not quite so strong; no difficulty is experienced in handling it. Machinery working well.

NAPA.

May Resume.—*Calistogian*, Jan. 23: Tbere is much talk about working soms of tbe many silver claims in the vicinity of Calistoga, and a few people from abroad have lately visited tbis section for the purpose of looking over ths mining district, but whether anything worth mentioning will soon result from such talk and visits remains to be seeu. One thing is certain, however, and it is that tbe question as to whsther the large ledges of silver-bearing ore are really of sufficient extent to guarantee the erection of quartz mills cannot remain unsolved a great many months longer.

Chrome.—H. A. Aldrich and W. W. Eggert, who own a farm near Glenbrook, in Lake county, have discovered an exteusive deposit of chroms iron on their land. They have prospected sufficiently to conviuce themselves tbat thers are thousands of tons, or for aught they know, ths deposit is unlimited. Assays have been made, and tbe owners state that the assayers in each instauce assured them that it was the richest ore of the kind they ever saw. Aldrich and Eggert will probably soon mine and ship a large amount of the ore, as they have an offer for it. A specimen exhibited in town last week looks very fine and appears to be all they claim for it.

NEVADA.

Started Up.—*Transcript*, Jan. 26: The Manzanita gravel claim, situated on the outskirts of the town, has started in for regular business. Although not in full blast yet, owing to the scarcity of water, they are utilizing all the water running in the Snow Mountain ditch, which yesterday amounted to 1,400 inches. Employment is given hers to between 40 and 50 hands.

Other Hydraulic Mines.—Hirschman & Co., near town, will work their property for all it is worth, as soon as ths ditch company can furnish them water. At Chalk Bluff, Hussey's Hayward's and the Bird's-eye Creek companies are making the dirt fly at a lively rate. The Cascade ditch is running a good-sized head of water, and the following claims will be in full blast shortly, some of them having commenced washing already: The Camden and Florence at Hunt'a hill; Jacobs & Sargent at Quaker hill, and Sim Jordan's at Scott'a flat. The North Bloomfield and Milton companies will be grinding out the gold as fast as ever shortly, if thers is not an entirely unexpected clearing up of the weather.

The ditches in the upper part of the county, which have been choked with ice and suow for some time, are now clear and the hydraulic prospect is good.

Vein Mines.—The sngine of the Scadden Flat hoisting works has been driving the pumps steadily all week. The shutting down, caused by the cold weather, lasted bnt a few days. The shaft of the Iron Clad mine below Rough and Ready is dowu 150 feet. The vein is good size and quality, and aa far as prospected has yielded $35 per ton. The Myers Ledge in which a rich strike was reported some time ago, is located near the upper end of Willow valley. The owners are starting an incline preparatory to the erection of hoisting machinery. The mill at the Deadwood mine will start up again next week. New coppers and new concentrators have been put in and other important improvements made. They have about 200 tons of ore on the dump at presnt.

Rich Quartz.—*Foothill Tidings*, Jan. 25: Some exceedingly rich quartz was taken from the Gold Hill mine a few days ago, by tributers, from the second level, 350 feet south of the shaft. The specimens taken out were very heavy in gold, some of the pieces but a few inches in thickness being estimated to contain several hundred dollars. This rock is probably on the line of a pay chute which is to be found in that part of the mine. But it will be several months before this can be tested, as by reason of the late cold wsather cutting off a water supply for the engines (the water from the shaft not being suitable for the purpose), and but a limited amount of wood on hand, the mine has been shut down until the winter season is over. Work will be resumed as early in the spring as it will be possible to obtain a supply of fuel at reasonable rates.

Watt Blue Gravel Mine.—The Superintendant's letter of the 17th inst., says that the main cast drift is in 1,200 fest, and is making fair progress, considering the extrems hard character of large boulders. There is no change in the appearance of the gravel since ths last report. The uorth drift, west of No. 2 wiuze, is in 60 feet, without any change.

SHASTA.

Afterthought.—Reading *Independent*, Jan. 23: At this miue work on the furnace is being rapidly pushed forward. The different parts of the works are being placed in position. The indications now are, owing to the very favorable fall and early winter weather, that ths mill will be completed for running sooner than expected. The fire-proof rock is already prepared for ths bottom of the furnace, and placed in position. The rock, in forming a bed, is claimed to be far superior to brick, not being as liable to be displaced by the plows passing over, and on account of the even and smooth surface there will be no danger of caking or choking up as heretofore by brick beds. The retorting works will be situated in about the same position as before, but with the advantage of a flue which will be constructed to convey away from the retort the smoke, flames, sparks and fumes arising, to one of the chimneys, situated some distance from tbe mill. This will be another great precaution against fire.

Copper City.—As work progresses the prospects here improve. The Extra company make their regular shipments of bullion and in one

[Continued on Page 76.]

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rope, the severest hailstorms occur during years of maximum sun-spots.

Dr. Hornstein, of Prague, has discovered a connection of the wind with the period of sun-spots; he shows that in Prague, as in Oxford, the average yearly direction of the wind in the time from fewest to most sun-spots progresses in the direction of from south to west; on the other hand, in the time from maximum to minimum sun-spots, it shows an opposite variation. He further finds that the average wind strength at Prague likewise exhibits a connection with the 11-years period of sun-spots, inasmuch as both phenomena reach their maxima and minima simultaneously. He says these results are based on 240,000 observations.

Dr. Moffat, of England, in discussing ozone observations from 1850 to 1869, found that the maxima and minima amounts of atmospheric ozone occurred in cycles of years which were coincident with the maxima and minima of sun-spots, the amount of ozone in some maximum years being five times the amount in some minimum years.

Investigations show that in Germany the best years for wine occur in times of minimum sun-spots.

Cassini has observed that the zodiacal light is much more brilliant when numerous and large sun-spots are present, and that it diminishes in brightness when sun-spots are few.

Having up to this point indicated some of the related celestial and terrestrial phenomena, it will be proper to inquire more particularly into the

Sun-Spots Themselves,

And endeavor to arrive at some reasonable hypothesis as to the nature of the sun, of its action upon the earth and the atmosphere, of the nature of sun-spots and the probable cause of the same.

The maximum, intermediate, and minimum presentations of sun-spots, and their related earthly phenomena, are not found to occur exactly at a definite period, but there is such a variation in the time of their recurrence that it is necessary to proceed along the line of averages. For facility of examination and comparison, it is usual to group both the maximum and minimum years by threes, and to place the remaining years of the 11-years cycle into the immediate group. The exact year of the minimum period, the year before, and the year after, constitute the minimum group, and the maximum group is formed in an analagous manner. The intermediate group may be called the average of the cycles; and natural motions may, at such periods, be said to be normal. The natural phenomena which seem to be indicated by the sun-spots, and which are, perhaps, produced by the same cause as are the spots, do not always coincide, in point of time or apparent energy, with the increase and decrease of the solar spots, but it has been found that they generally do occur within the three-years group. According to the formula of Dr. Rudolf Wolf, whose period of 11.11 years is usually taken as the average number of years required to form a complete cycle, the mean relative number of sun-spots in the cycle years has been, upon the average, as follows:

1st year	10.8
2d year	10.8
3d year	48.6
4th year	48.6
5th year	83.3
6th year	88.3
7th year	65.3
8th year	65.3
9th year	38.5
10th year	38.5
11th year	10.3

The time of

Average Ascent

Of the period from extreme minimum to extreme maximum, and the reverse motion, are not equal; the former has been found, by Prof. Balfour Stewart, to have a mean of 3.52 years, and the time of descent to have a mean of 7.55 years, giving an average period of 11.07 years. Dr. Wolf, founding his opinion upon a longer series of observations than Prof. Balfour, states that the average time of ascent is 3.7 years, and that the time of descent is 7.4 years, giving an average period of 11.1 or more closely 11.11 years, making nine complete periods in a century. Others, indeed, by basing their opinions on different facts, have estimated the length of the cycle as lying between 10 and 11 years; but Dr. Wolf's investigations have been so profound, so long continued, that, as they embrace the particulars of the sun-spots for several centuries back, his statement is now generally accepted as being true, or nearly so. It will be observed that the time of ascent to maximum disturbance is only one-third of the mean cycle, and that it takes twice as long for the spots to decline to extreme minimum as for the contrary movement. This is both remarkable and mysterious, and, at present, incapable of explanation. Mr. R. A. Proctor, in seeming despair of our ever really knowing much about the sun-spots, recently pronounced the whole subject of the cycle as being mysterious. It will, however, be patiently explored and understood in due time.

[To be Continued.]

A Far-Reaching Echo.—It is said there is a certain point on a ridge high up on Kearsarge mountain where can be heard the rumble of trains on the Southern Pacific railroad as they cross the range to the west of Mohave, 140 miles distant. There is a regular daily train passing at 10:30 o'clock, and upon reaching the place at this hour the noise of the train is heard as stated.

The Evolution of Words and Theory of Value.

[Read by Hon. Alex. Del Mar, before the California Academy of Sciences, San Francisco, December 16th, 1878.]

All words are subject to mutation. They are created, grow, give birth to other words, are altered in significance, absorbed, or lose their force, or dwindle away and become obsolete. This course of change is due to their environment, which is the human mind; and it is, consequently, into the evolution of the intellect that we must look for the evolution of words.

Rude men are rude of speech, and this consists of a few names, which chiefly represent the things of which they stand in present need, as food and drink. The qualities of these things next engage attention, and good, bad, big, little, hard, soft, etc., come into use as words. As the observation of these men extends and their minds develop, so do their vocabularies. Memory carries them into the past, imagination into the future. The single verb, *I am*, finds two new companions, *I was, I will be.* Presently the relations between things, and afterwards those between states of existence, actions and movements, are perceived, and words are coined to express them.

This coinage is usually of old metal, which is cheaper, or easier to obtain, than new. Poor people use their garments for many different purposes, and then often remake them before they cast them off, and buy new ones. The guacho's cloak is also his coverlid; his horse blanket his umbrella, and sometimes even his water pitcher. As it becomes worn, it is cut up for a pair of trousers; and when young Pepe grows old enough to require a similar garb of dignity, it is razeed and rendered serviceable again; and so it continues in use until at last, it is degraded to the menial level of a house-cloth.

It is thus also with words. Among undeveloped and also among decayed nations, the same word is used to convey a variety of meanings, as witness, many of the words in the Choctaw and the Chinese. When social development is taking place, the ever-used word is either specialized, and made to share its original meanings with other special words, or else it is superseded altogether by new terms; in which case the first word becomes degraded, and doomed to extinction. Thus *Lord*, which was once the name only of God, being superseded altogether by the latter term or its equivalent, subsequently became that of any exalted or powerful person; then passed generally to all landed proprietors, and is now attached to every petty boarding-house keeper, in the form of *land-lord. Master*, which had a similar exalted origin, is content to find refuge with the smallest of school boys. *Sire*, in the curtailed form of *sir*, has fallen from the dignity of feudal paramountship to the level of coal-heavers, and dustmen; and like *dame*, another word of noble origin, will probably, in time, become obsolete. In the other case—that is when the old word is retained for a special purpose—its meaning becomes refined with the general refinement of ideas, always supposing, of course, that social development continues. Thus *Barba*, is the Latin for beard, and originally barbarians meant simply a bearded man. *Civitas* is the Latin for a community, and originally a civilized man meant simply a settler or one who dwelt in a community. The difference between *barbarian* and *civilized* was therefore merely the difference between an indigenous Italian and a Roman colonist. The Etruscans, who were a highly refined people, were called *barbarians* by the hand of outlaws and pirates who founded Rome. Little by little these words came to have meanings; then, other words were created to share these meanings, as *wild, untamed, savage*, on the one side, and *enlightened, cultured, refined*, on the other; but the original words were specialized and retained. Passing over the Dark Ages, and observing the word *civilization*, as it came into use again in modern days, we find that it, at first, expressed merely a phase or condition of society; then, according to Guizot, a movement of society, and now it embraces both phase and movement, with the probability that in time, it will be partly displaced by *progress, social evolution*, and other more special terms. The word *money* is due to the temple of *Juno Moneta*, where the coins of the empire were fabricated. The use of this word, was, however, not common; for long after the Roman numerary system was broken down, *nummus* continued to be used as the generic term for the circulating medium.

The word "money" came into more general use during the Dark Ages, until with the scarcity, debasement and eventual almost entire disuse of coins, it was superseded by species; meaning, literally, payment in kind, but afterward in the form of specie, applied to coins and bullion. This word "species" was the lowest and grossest term employed to express the circulating medium of the times, the word *nummus* or "numbers," of the Roman Commonwealth, having been the highest and most refined. With the mediæval period, which fostered the Dark Ages and the reuse of coins, which the reopening of the Roman silver mines in Germany and elsewhere rendered possible, the word "money" again came into use, and being always associated with the precious metals, conveyed no meaning apart from them, and previous to the present century signified only so much gold and silver; this being the definition given to it by all of the earlier, and many of the later, economists.

With the general restoration of peace, the return of security, and the consequent use of corporative and governmental credits for the purposes of a circulating medium, the meaning of money has been amplified, and it is now generally understood to include any description of circulating media, whether coins, promissory bills, or irredeemable notes, otherwise nummaries or numeraries.

But perhaps the most extraordinary and interesting term in our vocabulary is "value." Everybody uses it, yet nobody appears to be certain of its meaning. For 100 years the ablest intellects in the world, Adam Smith, Chevalier Storch, Daniel Ricardo, Jean Baptiste Say, Frederic Bastiat, John Stuart Mill, and a host of lesser lights, have tried to agree upon a definition of value, but in vain. The entire science of political economy is built upon it; the practical affairs of government hinge upon it; an important agency of man's welfare (a good monetary system) waits upon it; and yet no man has satisfactorily analysed it. Although derived from the Latin word *valere*, the word "value" was not used by the Romans in its present sense. It came into use with the specie money of the Dark Ages, and previous to the time of Bastiat, scarcely 30 years ago, was generally construed to mean that attribute of a thing which was derived from its materiality and durability, or from the cost of its production (labor), or from its usefulness (utility), or from its desirability. These are the opinions, respectively, of Adam Smith, Ricardo, Jean Baptiste Say, and Chevalier Storch.*

But an application of these views to facts, showed all of them to be faulty. Light and air have, in the sense meant, neither materiality nor durability, nevertheless we concede the value of, and are ready to pay for, both illumination and ventilation. Neither buyer nor seller consults the cost of production; or else gold would never be bought, nor diamonds sold at their market prices, for one costs more than it will fetch and the other less. As for utility, it would be difficult to find more than the merest traces of it, in those works of art and luxury, which possess the highest value; and if we look for value in desirability, land, and water, and a myriad of other things, which necessarily form the first objects of man's desire, but which nature has supplied to him so liberally that they possess little or no value, arise to confute the definition.

Unable to digest the word as a whole, the economists attempted to manage it in parts. They split it into pieces, calling one *value in use*, another *value in exchange*, and so on, until each piece was small enough for their purpose; but, still in vain, there always remained a doubtful mass which they could not dispose of, and which constituted the enigma of the science they had attempted to construct.

Said Bastiat: "The primary element of exchange, is the notion of value; so that every truth, and every error which this word introduces into men's minds, is a social truth or error;" and "*value* is to political economy, what numeration is to arithemetic," and "economical science is condensed, and summed up in the word *value*, of which it is only a lengthened explanation."

In one masterly survey of the whole subject, this gifted philosopher swept away all the vague and many of the erroneous notions of value that had preceded him. He held that value was not an attribute, but a relation of things; that it implied "comparison, appreciation, estimation, *measure;*" or, as he otherwise explained it, "value is the relation of two services exchanged."

This view was a great step in the right direction. It was something to know that value was a relation, and not a thing, nor a mysterious issue of the attributes of things; it would have been more satisfactory had Bastiat informed us precisely what that relation was, but he died before his treatise on value was completed; and, judging from its appearance, probably, without revising the portion he had written. If an effort he now made to complete this work, it is hoped it will be viewed with the indulgence due to the earnest enquirer into any difficult subject.

In the first place it must be said that Bastiat's definition is hardly broad enough. Why should value be held to exist only between two services exchanged; why not between all services, and commodities exchangeable? The edifice which now shelters us, is not exchanged, nor being exchanged, yet it has a value; and that value is determined not by comparing it merely with the thing that may be offered in exchange for it, but, through the medium of money, by comparison with all other things which are exchangeable.

Value therefore exists not merely between two commodities, or services, but between all of such; and it exists not merely between things which are exchanged, but between all things which are exchangeable. The notion, common to other economists besides Bastiat, that money measures the value only of those things which are in market, up for sale, or being exchanged, is doubtless derived from the disparity between the magnitude of all commodities and available services, and the littleness of the measure—the mass of money—which forms their nominal equivalent. It would be equally absurd to hold, that gallons measure only wines which are being exchanged. The mass of money is of its present magnitude simply because it was so chosen to be, or so left to become; it can be made larger or smaller at man's pleasure, whenever he chooses to exercise the same dominion over it, that he has chosen to exercise over weights and measures; that is, whenever he chooses to define, and limit by law, the unit of measure, which, in the case of money, is the whole mass. Should this limitation increase or diminish the magnitude of the existing mass of money, this will not alter value, but only the expression of it in money, to wit, price. So, too, the gallon measure is of its present size, because it was so chosen to be; it would answer the same purpose, and prove equally efficient; no matter what its size was; only, in case of change, the expression of total gallons would be different. The quantitative and qualitative relations between all other things would remain precisely the same as before. But whatever the origin of the belief, it is evidently erroneous. The fact is, that nothing is being exchanged. It never can be said to be 12 o'clock, for time passes eternally; and, whilst we speak, nay, whilst we observe the clock, time has gone on, and escaped fixture. The act of exchange, indeed all actions, are equally unfixable, and if value pertained to objects only during the act of exchange, it would practically not pertain to them at all.

[But without attempting to follow the speaker through his argument, we give his conclusion. —Editors Press.]

Having thus determined what value is—namely, number, or the combined quantitative and qualitative relation between commodities and services—having at least attached to it a definite and precise meaning—it is now in order to turn to the evolution of the word. The course of this evolution has been already adverted to; but it has not been traced so fully as might be desired. What value represented to the archaic mind, we have no means of ascertaining. To the polished Greeks of Aristotle's time, we know, from his use of it, that it meant something akin to what we have defined; and so, also, it evidently meant to the Romans of the Commonwealth; for this is indicated by the root of the word *valeo*, or power, the power of numbers, for example. But from this time forward, it gradually came to have a more material meaning attached to it; until, in the obscurity of the Dark Ages, it came, at last, to mean a thing; and money, to represent it, was not money, unless it was also a thing; in other words composed of some commodity, as slaves, cattle, corn, gold or silver; and valuable only in proportion to the quantity of such commodity, as gold or siver, it contained. With the revival of learning, and the study of political economy, the grossness of this opinion rendered it no longer tenable; and yet, such was the difficulty of rising to the refined view of the ancients, that though it was evident that value was not a material thing, no one ventured to state just what it was. Its description was therefore attempted by circumlocution. It was shown that it originated in this or that way, or that it appeared or disappeared under this or that set of circumstances; but what it *was*, no one attempted to assert before Bastiat. With the correct assertion of its nature, namely, that of a relation between commodities and services, that philosopher stopped short. Precisely what that relation was, continued to remain the enigma of political economy; and it remains so to this day, unless the explanation herein attempted shall have the good fortune to gain general assent.

The evolution of this word has therefore kept pace with the evolution of European society. We—as Europeans—have but recently emerged from the Feudal Ages. The revolution in France, occurred less than a century ago; and feudal tenures and feudal survivals, together with feudal institutions and feudal forms of speech, are still closely interwoven in the texture of our practical life and vernacular tongues. Although some of us—we Americans, for example—have enjoyed the priceless boon of political liberty for several generations, we have scarcely yet had time to learn its deep significance—for what are a few generations of time in the life of a race?—and still less have we been able to throw off those invisible bonds, which shackle our social life, in the form of words that were cast or altered in the mold of mediæval ignorance and mediæval oppression.

*Bastiat, "Harmonies of Political Economy," p. 109.

Effect of the Imagination.—Sir Humphrey Davy, in his young days, assisted Dr. Beddoes, who at that time was bent on curing all diseases by the inhalation of gases. It so happened that Davy was accustomed, before applying the inhaler, to ascertain the temperature by placing a thermometer under the tongue. While thus employed on a countryman, who fancied this was the wonderful process he had heard of, the man exclaimed that he already felt better. Davy took the hint, left the thermometer in its place some time, and reapplied it every morning. His patient improved in health, and ultimately got quite well, without any other treatment.

Uniformity in Wire Gauge.—At a meeting of the Glasgow Chamber of Commerce, held recently, a report was submitted with reference to the desirability of establishing a uniform wire gauge. In the report it was suggested that the Chamber should concur with the Birmingham Chamber, in asking Parliament to supplement the Weights and Measure Act, 1878, by a clause instituting a legal standard to be recognized as a wire gauge.

The Cone-bearers, or Evergreen Trees of California.—No. 2.

[Written for the RURAL PRESS by J. G. LEMMON.]

Classification.

One of the earliest and most elaborate authors to treat of conifers was London, who (1st Edition in 1838) published his renowned "Arboretum." In it he describes all the genera and species known at the time, and distributes them as follows: North America, 40 species; Asia, 19; Europe, 14; Africa, 2; South America, 2; Australia, 2; Europe and Africa, 1; total, 80 species. It will be noticed that 40 species, one-half of the whole number, was ascribed to North America. Of these, 18 species were found in the United States.

Later, in 1853, Lindley's great work appeared, in which the number of species described was more than doubled, so actively had the work of exploration and scientific description been carried on during the preceding decade. These species were found to be distributed in about the same ratio—one-half of them being in North America.

One of the latest and most voluminous enumerations of the conifer family is by George Gordon, of England, in his splendid work, "The Pinetum." In it he describes 52 genera and 460 species.

But all these authors have followed precedent too much, and been limited in their researches by want of instruments and other helps, particularly good and abundant specimens, they being so difficult to prepare and so unwieldly to transport. Within a few years the discovery and application of the microscope has rendered necessary a thorough revisal and rearrangement of most of our sciences, especially those relating to natural history.

Scientists, aided by these helps, are arising here and there with special ability to grapple with most abstruse and formidable subjects. In the realm of botany alone, no one mind, either in Europe or America, is equally familiar with all its fields. The strongest minds are content with the mastery of a small class, a genus, or even a single species of plants. Compilers unite the work of these masters, and thus give to the world what would be a superhuman effort if contemplated by any one mind. And thus each of these specialists becomes an authority in the field of his exhaustive research, to whom all others must defer. To become such an authority it is only necessary to excel all precedent.

Authorities.

A few of these "authorities" may be mentioned: Sir Joseph D. Hooker, of England, forest trees; Dr. George Engelmann, of St. Louis, American forest trees; Prof. Asa Gray, of Cambridge, *gamopetalæ*, and especially of the immense order of *compositæ*; Prof. Daniel C. Eaton, of New Haven, lilies and ferns; Prof. W. G. Farlow, of New Haven, fungi and seaweeds *(algæ)*; Prof. George Vasey, of Washington, grasses; Prof. H. N. Bolander, of San Francisco, cryptogams and grasses of California; Mr. Anderssen, of Copenhagen, Eastern willows; Mr. M. S. Bebb, of Illinois, Western willows; Dr. H. W. Harkness, of Sacramento, fungi of California; Dr. C. L. Anderson, of Santa Cruz, sea-weeds of California; Leo Lesquereax, of Columbus, Ohio, mosses; Prof. Sereno Watson, of Cambridge, *apetalæ*; Prof. William H. Brewer, of New Haven, *polypetalæ*.

Orders of the Gymnospermæ

Authorities differ widely in the limits prescribed for the *coniferæ*, and as the rest of the *gymnosperms* are but few, it will be best to present the whole great class of *gymnospermæ*, or naked-seeded plants, comprising four orders:

1. *Pinaceæ*—Containing the three large tribes of *abietineæ*, *cupresseæ* and *junipereæ*.

2. *Taxaceæ*—The yew family, mostly found in the Eastern hemisphere; two species in California.

3. *Gnetaceæ*—The joint-stem family, mostly Asiatic; two species in California.

4. *Cycadaceæ*—Palm-pine; tropical; propagated in greenhouse; none indigenous.

Order 1. *Pinaceæ* (true conifers) *Tribe 1, Abietineæ*. Pine family. Fruit, a cone or strobile of numerous carpellary scales from the axil of a bract, arranged spirally around a more or less elongated axis. Contains four large genera.

1st genus—*Pinus* (from "pin," a point). Cone-scale on an elongated axis, leaves acerose, persistent, in fascicles, (single in one species), sheathed at base, each fascicle composed of 2, 3 or 5 leaves.

Species of Pine.

The entire number of species of pine throughout the globe is 92; in United States, 18; in California, 15; mostly discovered and named by the English explorer, David Douglas.

Species conveniently arranged by their leaves into three divisions. Species in each division distinguished by their cones, barks, etc.

Division A. Monæ—1-Leaved, Double.

1. *Pinus monophylla*, Torr. "Nut pine," of Nevada and eastern California foothills. Cone small, 2 to 3 inches thick, globular; esteemed for food by Indians. Timber very resinous. All parts of the tree strong-scented.

Division B. Binæ—2-Leaved, Short.

2. *Pinus contorta*, Doug. Improperly called "California tamarack;" high valleys; bark very thin; cone very small, 2 to 3 inches long.

2. (a) *Pinus contorta*, var. *Bolanderi*, "Bolander's pine; coast; cone smaller; thick, scaled, 2 inches long.

3. *Pinus muricata*, Don. "Bishop's pine;" coast; cone medium, very spiny, three inches long.

Division C. Ternatæ—3-Leaved Long.

4. *Pinus ponderosa*, Doug. "Yellow pine;" common; bark, yellowish; cone, medium; four to six inches long.

4 (a). *Pinus ponderosa*, var. *Jeffreyi*; "pitch pine;" high slopes; cones large, 6 to 8 inches long.

4 (b). *Pinus ponderosa*, var. *Benthamiana*. "Black pine;" near water; bark black; cone large, 6 to 8 inches long. These varieties run into each other imperceptibly, on the Sierra.

5. *Pinus insignis*, Doug. "Monterey pine;" coast and cultivated; cones medium, 3½ to 4 inches; close and hard; close-scaled, gibbous.

6. *Pinus tuberculata*, Don. "Knob-cone;" foothills; cones medium, 3 to 5 inches long; hard, close-scaled, gibbous, narrow.

7. *Pinus Sabiniana*, Doug. "Big cone" or "gray-leaf;" foothills; cones very large and heavy, 8 to 10 inches long; spines large and recurved.

8. *Pinus Coulteri*, Doug. "Spur cone"; southern coast; cones very large, 7 to 10 inches long; spines, curved upward.

9. *Pinus Torreyana*, Parry. "Torrey's pine" (rare). Southern coast; cones medium, close, spurless, 3 to 5 inches long.

Division D. Quinæ.—5-leaved, Short.

10. *Pinus Lambertiana*, Doug. "Sugar pine." Common; cones very large, 15 to 24 inches long, and soft-scaled.

11. *Pinus monticola*, Doug. "Mountain pine," or "white pine." High slopes; cones similar, but much smaller, 5 to 7 inches.

12. *Pinus albicaulis*, Engel. "White-stem" (rare). High peaks; cones small, 2 to 2½ inches long; globular, few seeded.

13. *Pinus flexilis*, James. "Bull pine" of Nevada. Cones medium, conical, 3 to 4 inches long.

14. *Pinus aristata*, Engel. "Bristle cone." Peaks; cones very small; spiny. Rare in California.

15. *Pinus Balfouriana*, Jef. "Balfour's pine" (rare). Shasta; cones medium; (little known).

[To be Continued.]

USEFUL INFORMATION.

Arsenic in Coal.

Dr. Stevenson Macadam read a very interesting paper before the Edinburg Pharmaceutical Society, "On the Presence of Arsenic in Soot," in the course of which the Doctor remarked that the coal consumed for household and general purposes invariably contained more or less sulphur in the form of iron pyrites, and that occasionally the quantity was so large as to be capable of detachment from the coal before the latter was sent into the market. The pyrites so obtained was commonly called "coal brasses." Dr. Macadam had recently had occasion to make some investigations as to the possible presence of arsenic in the atmosphere of towns, and it occurred to him that if the arsenic in the pyrites of the coal was volatilized with the sulphur, that probably evidence of such disengagement of arsenical vapor in coal smoke might be obtained by the analysis of soot. Accordingly, he procured a number of samples of soot, collected from different chimneys, and had no difficulty in determining the presence of arsenic in every sample. He mentioned that trials made on samples of soot taken at different hights in the same chimney proved that the arsenic was present in larger quantity in the soot collected near the fireplace than in those taken from the top of the chimney. From his results it was demonstrated that arsenic was evolved during the combustion of ordinary coal, and a part of it was condensed in the chimney along with the carbon and sulphur of the soot; but as a great part of ordinary coal smoke passes into the air there could be no doubt that a portion of the arsenic accompanied the smoke into the atmosphere. The more inferior a coal then, as a rule, the more pyrites it contained, and probably also the more arsenic. He must, therefore, reckon that every coal fire was a producer of arsenical vapor to a limited extent; but, notwithstanding the enormous quantity of coal consumed in towns, he was not prepared to say that the arsenical contamination of the atmosphere from that source was of any practical moment in a sanitary point of view.

INTENSE cold and pressure develops paraffine in crude petroleum, and thus we find that the pipe lines of the oil region have become so clogged with paraffine since the advent of the recent arctic wave, that they cannot transport oil in sufficient quantity to keep pace with the production. It is claimed that in the northern oil field alone from 5,000 to 8,000 barrels of oil are going to waste daily from this cause. In some cases the freezing is not so great as in others. This is owing to the oil being pumped through pipes sunk in the ground. The drilling and pumping wells have also, in many cases, been brought to a stand-still; partly because the streams which feed the boilers are frozen dry, and partly because the men cannot stand or work in the derricks with the temperature at or below zero.

CURIOUS FACTS ABOUT IRON.—Colonel Cazen, in a recent article on the subject, says: During his sojourn in the arm manufactories of St. Etienne and Tulle, at the central depot of artillery, and at the manufactory of Chatellerault, he was able to make important researches on iron. The fracture of iron may be nervous, in grains more or less fine, or in facets sometimes having a surface of several square millimeters; often it presents a mixture of these three features. Thus it is impossible to judge of the quality of an iron before breaking it; and it is on this account that in arm manufactories they break a certain number of bars with which they make a certain number of pieces for which they are intended, and which are afterwards broken to ascertain their resistance—that is, the goodness of the iron, which, moreover, is still rendered brittle in presence of phosphorus, arsenic, or sulphur. The best irons are the nervous, then those of fine grain and with facets. On railways it has been proved that rails placed in the direction of the magnetic meridian are affected quite differently from rails placed at right angles to this direction; the former oxidize and do not become brittle. In intermediate directions the rails participate more or less in the qualities of those which are placed in the two extreme directions. What becomes of the iron which is now so plentifully used in the construction of buildings—girders among others?

PIG-LEAD FROM SMOKE.—The following explanation is given as to how pig-lead may be produced from smoke: In the process of smelting the ore a great deal of it escapes in the form of lead fumes, and the White Lead Company was organized for the purpose of catching this smoke, and, by passing it through an almost endless line of pipes of sheet-iron and woolen bags, condense it. The result was that after an outlay of many thousand dollars and a year's experimenting, they have succeeded in condensing the smoke or lead fumes, into metallic lead, the same as steam is coverted into water. The product of the fumes is a bluish, impalpable powder, which makes a splendid blue paint, pronounced equal to the corroded article. For the purpose of making it white several furnaces were built, and the blue product, with the aid of an intense heat, is again changed into lead fumes, which are again condensed, and come out pure white lead. In the transforming of the blue lead into fumes, the object is to sublimize it all, but the heat is not powerful enough to do so.

HOW TO UTILIZE OLD FRUIT CANS.—Perhaps one of the most appropriate uses of an old fruit can that can be devised is to make it contribute to the growth of new fruit to fill new cans. This is done in the following manner: The can is pierced with one or more pin holes, and then sunk in the earth near the roots of the strawberry or tomato or other plants. The pin holes are to be of such size that when the can is filled with water the fluid can only escape into the ground very slowly. Thus a quart can, properly arranged, will extend its irrigation to the plant through a period of several days; the can is then refilled. Practical trials of this method of irrigation leave no doubt of its success. Plants thus watered flourish and yield the most bounteous returns throughout the longest droughts. In all warm localities, where water is scarce, the planting of old fruit cans, as here indicated, will be found profitable as a regular gardening operation.

DECORATION OF ZINC.—A chemical process for covering zinc with colored coatings has lately been described by Dr. L. Stille. The articles of zinc are first brightened by scouring with quartz sand, moistened with dilute muriatic acid, putting them quickly in water and then carefully wiping them dry with white blotting paper. To ensure success, however, it is necessary to employ zinc as free as possible from lead, and to have it as bright as a mirror. When these conditions are fulfilled the metal may be coated with a variety of beautiful colors by immersion in a solution of alkaline tartrate of copper for a shorter or longer interval of time, depending on the color that is desired.

GOOD HEALTH.

Snails for Medicine and as Food.

While snails are no longer an article of *materia medica*, says the *Phar. Jour.*, they are occasionally used in England, boiled in milk, as a popular remedy in diseases of the chest, simply, perhaps, for the reason that their mucilaginous properties are looked upon as likely to prove beneficial. But although snail soup is usually suggestive of the ludicrous to the English mind, M. Baron Barthelemy maintains that snails are capable of rendering valuable service in most chest complaints, bronchitis, asthma, etc., because, in his words, they contain "animalized sulphur, a little phosphate of lime, and especially carbonate, animalized, in solution, and in a nascent state in their mucilage."

M. Barthelemy made a specialty of snail preparations in his exhibit at the recent Paris exhibition. He displayed "snail syrup," "snail bonbons," and "helicine," as mucilage and powder. For these the edible snail *(Helix pomatia)* is used, and collected in the vineyards in the south of France (preferably in the months of August and September), and carefully preserved and fed during the winter.

He lays great stress on this feeding, and attributes the reason that these snails are not more generally used as an article of diet to the fact that their flavor is only properly developed where they obtain suitable food, as, for instance, in the vineyards of the south of France and Italy. However this may be, and whatever may be thought of the chemistry of this subject, it is certainly the fact that when this very mollusk was a titbit of the Roman epicure, it was, before being cooked, fattened in the *cochlearia* by means of a paste composed of meal and wine.

Action of Iron, Cod-Liver Oil, and Arsenic in the Blood.

Drs. E. S. Cutter and E. H. Bradford, of Boston, in an article in the *American Journal of Medical Sciences*, state that they have arrived at the following conclusions as to the effect upon the blood produced by administration of these drugs, both in health and disease:

1. In health, iron causes no increase in the number of the red corpuscles; but in the pathological state called anæmia there is an increase in the number of the red corpuscles under its use.

2. In the healthy subject, cod-liver oil causes an increase in the number of the red corpuscles, and a slight increase in the white. In certain pathological conditions this seems to be also the case if the medicine is well borne. If, however, the morbid process is active and the appetite is disturbed, the medicine does not appear to check the consequent anæmia.

3. Liquor potassæ arsenitis given in health caused a progressive decrease in the number of the red and the white corpuscles, that of the latter being most marked. In severe anæmia, on the contrary, there seems to be an increase at first of both red and white corpuscles. After a certain point there is a steady diminution of both, however. In the case of leucocythæmia there was a decrease in both red and white corpuscles, the decrease of the latter being very marked.

Edison's Cure for Neuralgia.

For the benefit of sufferers from neuralgia, we give Edison's recipe for his polyform, which is said to be remarkably successful in curing or deadening the pain of that terrible disease. It must be remembered that it is for outward application only: Chloroform, two ounces; chloral hydrate, two ounces; alcohol, one and a half ounces; camphor, one ounce; sulphuric ether, one ounce; sulphate morphine, six grains; oil peppermint, two drams. Shake thoroughly. It can be put up at any drug store.

The *Drug Reporter*, from which we clip the above, adds the following:

For Sciatic Rheumatism.—Iodido of potassium, two drams; cinnamou water, four ounces. Mix. Take one teaspoonful three times a day, before eating. It is also excellent for dyspepsia.

Cough Drops.—For an obstinate cough take syrup tolu, one ounce; paregoric, one ounce; mucilage gum arabic, one ounce; tincture tolu, two drams. Mix. For an adult, one teaspoonful two or three times a day. Half that quantity for a child.

These recipes are endorsed by the highest medical authority, and both are said, by the *Drug Reporter*, to have brought about some remarkable cures in a very brief space of time.

TIN-LINED STOMACHS.—"Yes," said a well-known chemist to a *World* reporter last evening, "people will have tin-lined stomachs before long." The chemist went to a closet and took therefrom several small bottles which he held up before a strong light. He exhibited several sheets of tin which had been extracted from sugar purchased from extensive dealers in sugar in this city. "This," said the chemist, "is what they use in the adulteration of sugar, and I am informed that some of the dealers buy it by the ton. This tin has been cut with muriatic acid, and was used in sugars and syrups. I have here (exhibiting some other small bottles) samples of glucose. From 25% to 30% is used in sugar and 65% in syrups. Poor starch and flour are also used by some of these wealthy sugar dealers, and I am informed that such adulterated sugars produce skin disease. Here is a bottle (exhibiting a reddish brown powder) that I cannot describe. I don't know what it is, but intend to find out. It was taken for sugar." The chemist is yet at work, and in a short time expects to make his report public.—*New York World.*

TOAD POISONING.—The following singular account of the action of toad poisoning on the human body, is reported in the last number of the London *Chemist:* A child of six years old followed a large toad on a hot summer's day, throwing stones at it. Suddenly he felt that the animal had spurted some moisture into his eye. There suddenly set in a slight pain and spasmodic twitching of the slightly injected eye, but two hours after coma, jumping sight, desire to bite, a dread of food and drink, constipation, abundant urine, great agitation manifested themselves, followed on the sixth day by sickness, apathy, and a kind of stupor, but with a regular pulse. Some days later, having become comparatively quiet, the boy left his bed; his eyes are injected, the skin dry, the pulse free from fever. He howls and behaves himself like a madman, sinks into imbecility and speechlessness, from which condition he never rallies.

MINING AND SCIENTIFIC PRESS.

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Tramp Chuck, Trump Bros., Wilmington, Del.
Situation Wanted.

The Week.

The rain, which commenced at this point about one week ago, has since continued, having come in such installments as have been calculated to effect the most good. We have had a number of smart showers and again some drizzle and mist, all of which has been absorbed by the thirsty earth, completely saturating the dry stratum on top and generally penetrating some distance below. This has made plowing possible everywhere, and so replenished the mountain streams that the hydraulic miners have now water enough for washing. As a consequence, great activity pervades this branch of mining, and the weather having been otherwise favorable for this class of operations, a good deal of gold dust is being taken out. Some of the quartz mills dependent upon water for their propulsive power, and which, through an insufficient supply bad, for some months before, been in a state of enforced idleness, have also started up since the advent of the rain, and are turning out bullion once more. Things along the California gold belt point now to an average good year. As a consequence, the miners are in much better spirits than they were but a week or two ago; something of this more cheerful condition of things in the interior having already been reflected upon the trade and general business interests of the city. Since our last issue the death of Dr. Linderman, Director of the United States Mints, is announced. This is an event that will generally be deplored and which will possibly cause the Government some inconvenience. Dr. Linderman, through his long connection with the mints, having been especially well qualified to fill the position he held.

The United States Geological and Geographical Surveys.

Bulletins 2, 3 and 4 of volume IV of "Hayden's Survey" have come to hand. The first of these contains a paper on the "Geographical Distribution of Mammalia, considered in relation to the principal ontological regions of the earth and the laws that govern animal life," by Joel A. Allen—which is of more than ordinary interest on the Pacific slope, in view of the facts that are being gathered here, touching the migrations and antecedents of our tertiary ancestors. It is only within quite recent years that the richness and value of our western and northwestern cordilleran lake and river deposits, of Cenozoic Age, have begun to be appreciated; and that the scattered knowledge that was extant in regard to the origin and relations of the Indian races, has at all been collated. So that there has never been at hand a convenient starting point for a study of the mammalian companionship on which we are obliged to rely for guidance in what may be fairly termed the geological history of our race. Mr. Allen's essay, though a critical study, merely of the realms of living mammalia, contains all the observations and deductions of the great naturalists, which are here harmonized, as far as possible.

We have had the local studies of Condon, Cope, Marsh, Hayden and Leidy, from fossil sources, along with Hector's, of the great dynamical changes whose marks are recorded in the flanks of the Rocky mountains; and as the world progresses, these, with other contributions yet to come, cannot fail to throw much light, in the near future, upon that important and central field—so far as the popular interest is concerned—of geological investigation.

The same number of Hayden's Bulletin contains an article by E. D. Cope, describing some of the "New Extinct Vertebrata from the Upper Tertiary and Dakota Formations." Many of them were collected by Charles H. Sternberg, Cope's assistant, recently in Oregon; others by Lucas and Condon, in Oregon; J. C. Isaac, in Montana; and John Collett, in Indiana. Zoological papers by Jordan, Cones, Thomas, Uhler, Edwards, Allen, Scudder and others, are plentifully represented in all of the Bulletins.

No. 3 contains an article on the "Mineralogy of Nevada," by Dr. W. J. Hoffman, based on collections made while he was connected with Wheeler's surveys in 1871. It is a valuable additions to our catalogues of determined minerals and available localities. Enough of this kind of work has been done—though it is all scattered and incomplete—to justify the hope that the Geological Section of the California Academy of Sciences will shortly collate a card catalogue of the obtainable minerals of the coast, with a view to facilitating private collection, by members, miners and mining students. Most of the minerals interesting to the coast in connection with ores or mining could be obtained and exchanged at a moderate cost, and with very little trouble.

Bulletin No. 4 contains paleontological papers by Scudder and White; and an article "On Some Striking Products of Erosion" in Colorado, by F. M. Endlich, the latter describing the chemical and mechanical methods in which nature is in the habit of producing some of her most remarkable scenic results.

These reports, along with those of the Wheeler and Powell Surveys, are distributed gratis by the Government, and are intended for the use not merely of observers and collecters, but of all those whose pursuits render it desirable or necessary for them to be familiar with the details of their fields of operation. While much of the matter in its original published form is necessarily technical and concise, popular forms and generalizations of a more universal interest, of this material in prolific crop, are sure to follow, and to reward and justify the wisdom of the Government in connection with these well conducted physiographical surveys.

Hayden has boldly invested the Rocky mountains, where he is unlocking their intricate mining and geological phenomena, from their most ancient and central core, through the various tilted mineral-bearing formations, to the flanking coal and placer concentrations of more recent times. King made a section of the plateau, including the essential features of all the cordilleran ranges. Wheeler, following the broader instincts of the old topographical corps of the army, takes in the geography and geology of the mining districts of the west, and appears to be concentrating his forces upon the western plateau and the country of the western range—the Sierra Nevada and Cascade mountains. Powell has an attachment for the brighter action of the great river valleys, with their human inhabitants. The United States Land Surveys—as yet unorganized physiographically—complete the list.

So far from these surveys interfering with each other, their fields are separate; and it is safe to say they are generally governed, in their scientific and engineering personnel, by motives of generous rivalry alone. Exceptional causes aside, it is undoubtedly necessary occasionally, in the public interest, to make common cause against mischief-makers, whose conceptions are narrow, or who are selfish enough to block the highways of progress; whose instincts are low enough to embroil their neighbors. While these surveys are receiving the consideration of Congress, however, the claims of the Pacific States and Territories to a general geographical and geological exploration, such as we have seen thus systematically begun, and auspiciously carried forward over a large portion of our new country, should never be lost sight of, nor allowed to be hindered in the least degree by any sinster causes. It is in this work—now leading and now following the busy industries and populations in whose interest it is carried forward—that the glory of the great conquest that is in progress, by our own generation of Argonauts, will culminate in one of the brightest pages of history.

Comstock Studies.

We noticed at some length the phenomena observed by Church in connection with the heat, as found in the depths of the Comstock lode. Equally interesting are his facts and deductions touching chemical action now in progress, giving rise to heat. In this connection he brings up an entirely new suggestion. Hitherto the only mode of producing heat that has been thought of, has been some process of oxidation, and about the only substances which are susceptible to this change are the metallic sulphides. Principal among these is pyrite, the sulphide of iron, one of the most common minerals of the world. Whenever a chemical source of heat has been sought this material has been vaguely referred to as the likely agent of its production. Prof. Church rejects this source of heat and on good grounds. He says:

"Wherever eruptive or plutonic rocks are found it is quite common to witness evidence, in the breaking out of hot springs, that heat agencies are still active within them, and this phenomenon is so frequently observed that hot springs are often referred to as the last phase of eruptive activity. The heat in the Comstock and other mines similarly situated is quite generally spoken of, for instance, as the feeble remnant of a temperature that once reached the point of rock fusion, but the facts encountered have compelled me to seek another explanation. It is impossible to assemble in an annual report all the data upon which this conclusion is based, but many of them will be given. They have led me to refer the high temperatures encountered in the mines not to the internal heat of the earth, nor to the residual heat of the rocks, which were once melted, but to chemical action now maintained in the erupted rocks.

"This action is not a combustion, for the oxidizable minerals in the lode and its accompanying rocks, the metallic sulphides, are little altered. In fact, the total quantity of pyrite and other sulphides is not large for the neighborhood of a mineral lode, but on the contrary, strikingly small, and not sufficient to maintain the heat of the rocks and water, except under circumstances of unusually rapid oxidation. That no metallic oxidation of any moment goes on in these rocks is susceptible of proof. The metallic sulphurets in the rock show little sign of decomposition, and this is true even in layers of the propylite, that are fissured and seamy and drenched with water, whether hot or cold. In fact, the preservation of the sulphur compounds, in presence of so much heat and moisture, is a noticeable fact, which I have frequently remarked in all the mines."

Several analyses of the mine waters are brought forward in proof of these assertions. The oxidation of pyrite produces the soluble sulphate of iron, and this would be precipitated by the lime of the rocks and form gypsum, which in its turn would be precipitated in cracks in the rock. Neither this nor the iron sulphate is found in any quantity, and Prof. Church concludes that the gypsum in the Savage water accounts for only two-thirds of 1% of the heat it contains.

The new explanation of the source from which heat in the earth's crust is derived carries important results with it. Whenever a liquid consolidates to a solid, heat is given out, and this fact plays an important part in the economy of the earth. Its most familiar illustration is the commonly observed fact that the appearance of snow often ends a severe spell of cold weather, the condensation of the moisture producing heat which warms the air. In precisely the same way the coolness which comes on at nightfall with the disappearance of the sun is modified by the condensation of the dew from the moisture which floated as vapor in the atmosphere.

The heat produced in the rocks is a consequence of the same law. The rainfall penetrates the rocks to a very great depth, good authorities not hesitating to acknowledge a percolation to the depth of 90,000 feet. It has also been proved by Dauhree that when silicate of alumina, which is the principal component of the Comstock rocks, is exposed to the action of water at great pressure, it takes up some of the water which combines with it chemically and produces clay, that being a hydrated silicate of alumina. In this process the fluid water becomes part of the solid clay, and gives out heat in its condensation.

Rain always dissolves the gases of the air in its descent. Carbonic acid, nitrogen and oxygen are all dissolved and carried with it into the crust of the earth, but when it solidifies these are liberated and take their way to the surface. Of course they are heated by the action that set them free, and we thus have streams of hot gas pouring through the rocks. It has been shown above that the transmitting power of the rocks is not sufficient to keep up the heat found in them, and Prof. Church's theory is that they are heated by these streams of hot gas. It is evident that close-grained rocks which give but little opportunity for the gases to pass, will not receive as much heat as those that are more open, and wherever broken rock is found that gives free passage to the gas through its crevices the heat will be highest. It is also a fact that has been observed, that wet rock does not pass gas at all. Rocks may be penetrated either by water or gas, but when the former has once entered, the latter is excluded unless the rock becomes dry again.

These facts are applied to explain some of the peculiarities of the Comstock. It is well known that some drifts are much hotter than others, and Prof. Church points out that whenever a drift lies in the shattered rock which often accompanies the black dyke, it is apt to be very hot. He also says that the hot spots of the lode lie in bands, and these bands he supposes to consist of shattered rock. He divides the country rock into two portions, the wet and the dry. The heat is generated in the wet rock by kaolinization, and the dry rock is heated by the passage of the resulting gases.

These facts are used to explain the puzzling differences which have hitherto vitiated the attempts to ascertain the rate of increase of temperature in the earth. It is often given at one degree for every 50, 60 or 70 feet of descent, but such statements lose sight of the figures which have been obtained. These run from 35 to 200 feet for one degree of increase, and no suggestion has ever been made before to account for the discrepancies. Even on the Comstock the rate varies according to the observations which are compared, and might be given at 25 feet or at 45½ feet to one degree. The latter rate seems to be the more correct, and this fact makes it quite improbable that we know anything trustworthy of the real rate of increase in the crust when the observations are in ground which is not liable to the peculiar conditions of the Comstock region, for there the rate is a maximum.

From this basis Prof. Church attempts to form an idea of the future fate of these mines. If the stories from the Comstock are to be believed, work in the mines will be almost impracticable if the heat increases to an important extent. Already we have reports of 140° and even 160° Fahr. in some drifts. But such accounts are probably inaccurate. No such temperatures are recorded in Prof. Church's work. He gives the temperature of most drifts at 108° to 116°, the latter for very long drifts. This of course is not the normal temperature, but that which obtains when a fair current of air is blown through them. Starting with the data given and allowing an increase of one degree for 45½ feet, the temperature of the rock at the 4000 level would be 174° Fahr. Inasmuch as the heat of the air is 108 to 116 degrees where the rock is 138 degrees, it is probable that the drifts on the 4000 level will not be above 130 to 140 degrees in temperature, and this may be modified to an important extent by altering and increasing the ventilation.

The great question is, will the heat increase below as fast as it has in the last 1,000 feet of depth, and will it rise to the boiling point of water? Our author says the data known is too vague to enable him to form an opinion on this important subject, but he has the impression that nothing in the known facts makes it certain that so high a heat will have to be met within the limits even of deep mining. The highest heat known in the mines is for air 154° in a closed drift, in the Crown Point 2000 level; and for water 154°, in the Savage and Hale & Norcross. While Prof. Church does not deny the possibility of finding still hotter water, he seems to have the impression that this may also be somewhere near the highest heating power of kaolinization at these depths. It is true that the water of Steamboat springs is boiling hot, but the sources of this may be near the surface where organic acids would play their part and increase the rapidity of the action. For these reasons he says that while the temperature of the rock and water may increase somewhat, it is not likely to rise to 212° Fahr.

As to the possibility of working in the increased heat of greater depths, the case of the Crown Point crosscut is an evidence that work can be done even at such excessive temperatures, and there is little doubt that means can be found to lessen the severity of the task.

These studies upon the cause of heat in the mines are only a subordinate part of Prof. Church's work. He has prepared a full account of the geology of the lode, in which the position of the bonanzas, the cause of ore as distinguished from barren quartz, the history of the lode's formation, and many other fundamental facts are discussed. This is accompanied with maps and sections of the great Gold Hill and Virginia bonanzas, showing clearly their true position in the lode. For the first time the position which the ore invariably occupies is made out, and the mode of searching for it is indicated. The true relation of the barren portions is shown, and the lode is proved to contain rich and barren zones placed in a certain order. This work is finished, and its publication may be looked for at an early day.

In 1878 there were 532 failures in California, of which 222 occured in this city, and 310 in other parts of the State. The liabilities were, in this city, $4,700,591; in other parts of the State, $6,899,539, making a total of $11,600,130. In 1877 the liabilities amounted in the aggregate to $11,736,276.

Well-Boring Machinery.

Our recent articles on artesian wells have interested many readers, if we can judge by the tenor of the comments upon them, which come in correspondents' letters. The obtaining of artesian water is of crowning importance in many localities, and this year there will be renewed interest in well-boring, because the season's rainfall promises to be rather scanty.

The engravings of well-boring appliances which we have given heretofore, and those which appear upon this page, will give readers a good idea of the manner in which the inventors have aided the well-borer in furnishing him effective apparatus. There is a point in favor of well-boring in this State, which is noted by an experienced Eastern well-borer. He writes us that after studying our descriptions of wells which have been sunk, he concludes that California well-borers have a marked advantage over their Eastern confreres, by reason of the different strata encountered here, as compared with those in the Eastern or Middle States. He refers to the bore at Fort Wayne, Indiana, which is over 3,000 feet deep, and fully two-thirds of that depth is solid rock. This proportion holds good throughout the entire oil-bearing region, and in fact, in all the older States where deep bores have been made. On the Pacific coast, the proportion of rock is very small, there being frequently but a few feet of hard rock, in a bore of several hundred feet. This difference in the formation necessitates the use of entirely different tools from those used in the Eastern States. The heavy rock-drilling outfits, costing hundreds of dollars, can be exchanged for a light attachment used on the derrick, and run by hand, or by spring pole or horse-power; the drills costing not over $50, and the attachment for man or horse, costing only from $10 to $60. These tools have been used to cut through hundreds of feet of rock, and they are said to work as fast as the more expensive ones.

It is a view of these cheaper devices for deep boring which we give on this page. They are the inventions of Oscar Rust, and are made and sold by the Rust Well Auger Company, of Macon, Missouri. They are said to have been fully tested and approved by the work which has been done with them at the East.

Fig. 1 represents auger worked by horse-power. When at work the upper end of shaft is always below the shreve, a pulley in the top of the derrick, and a swivel in the lower part of the rope near where it is attached to the auger preventing any twisting of rope, and gives the operator constant hold of the auger.

Figs. 2 and 3 show ordinary shallow well augers. They are made from 12 to 18 inches in diameter, and are calculated to work to the depth of 100 feet. Greater depths require smaller tools.

Fig. 4 shows wormer for loosening small boulders, cobble-stones and hard-packed gravel, and for working through hard-pan, slate, coal, soapstone, soft sandstone, or anything except solid hard rock. It is steel-pointed and warranted to do the work.

Fig. 5 shows the drill bit and reamer, in general use throughout the oil region in Ohio and Pennsylvania, and by artesian well borers throughout the Eastern States.

Fig. 6 shows an auger devised especially for artesian well boring. It is made of all steel, and is claimed to be the lightest running, fastest boring and most easily handled auger now in use. It is made from four to six feet long, and of any diameter from four to ten inches. By adding rubber belting valves at the bottom, and a small hook or hasp to hold the sides together in sand, a most effective sand auger is secured. The operator with this tool is enabled to penetrate clay, sand, gravel or any formation he may encounter except solid rock.

The augers here shown at Figs. 2, 3 and 6, each cut a hole from one-half inch to one inch larger than the body of the auger, thus giving free passage for air and water. These augers are especially calculated to work inside iron casing. The presence of the hard earth against the bits as the auger is being revolved, causes the bits or lower end of the sides to spring out a trifle, thereby cutting out under the casing, so the casing will easily settle. When the auger ceases to revolve and the hits no longer engage the earth, the sides spring back to their original position, and the auger comes up inside the casing. But if from any cause the sides do not spring in, a slight backward turn as the auger is being raised will press them in, and the loaded auger will come up perfectly free.

The sides of these augers hinge on a pivot-holt in the lower corners of the head, and are fastened by keys, as shown in the cut. To empty or discharge the load, the operator knocks out the keys, the auger swings open and the load drops in a cart or truck run under for that purpose.

A full set of horing tools, shown herewith, consisting of augers in Figs. 2 or 3 (any size), two turning levers, and the full derrick rig, consisting of two wheels, two axles, two cranks, four pair hoxes, one shreve or pulley and one swivel, costs $60. The auger shown at Fig. 6 is $10 extra. The shafting or rods used with these augers is two-inch gas pipe, with one length of solid squars iron above the ground for turning levers to attach to. These are furnished at 50 cents per foot when desired.

The couplings are all placed inside, and are simply a plug of two-iuch round iron, one end rivcted or welded in ous end of a gas-pipe, and the other end to be iuserted iu the end of the next length of gas-pipe, and fastened by two iron pins. The pipe is strengtheued at the piu holes by a baud of iron four iuches wide and one-quarter of an inch thick, shrunk over the end, ths pins passiog through tbe baud, pipe and coupling.

In lifting the auger from the bottom of the well, as each length of shafting comes above the ground, the coupling is loosened hy a blow of a hammer on each pin, and the length is lifted off and left standing in the derrick, without stopping ths aiger in its passage up, or 40 feet of shafting may be run out at the top of the derrick. These couplings are made at an expense of only about one dollar each; they are strong and durable, and aro said to be handled in one-fourth the time of any other.

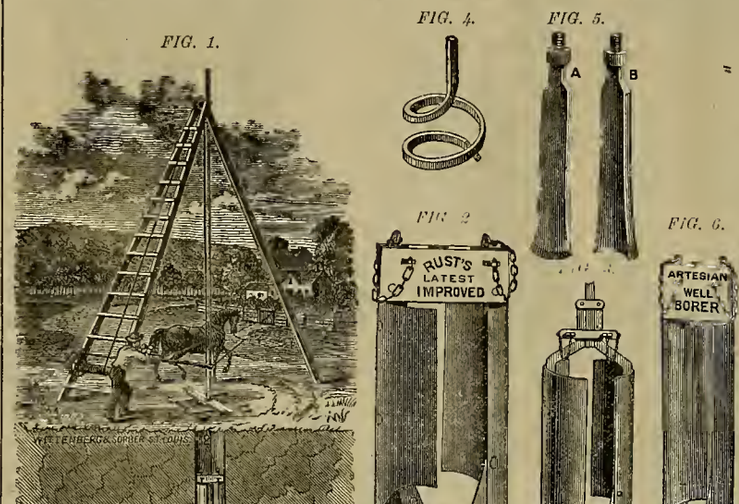
The Mechanics' Fair.

The Managers of the Mechanics' Institute decided, a short timo since, on holding another fair this year. As it has been customary every other year to offer premiums, and some were given last year, if the custom is followed, premiums will be given at the next coming exhibition.

If it is finally decided to do this, the premium list should be made out as soon as possible, in order that persons desirous of competing may have time for preparation. Cash premiums are, of course, the best and would, without doubt, tend greatly to increase the interest in the exhibition. There are a good many poor inventors who cannot afford to build machines and then attend to exhibiting them for five or six weeks for nothing. Many of this class would do so, however, if they saw any hopes of making a few hundred dollars. The Managers will probably take these facts into consideration and if possible offer a liberal premium list.

A quarterly meeting of the Institute will be held on February 6th, when it will be decided whether the annual election will take place March 1st or be deferred until June again. It is considered by some to be bad policy to change the Trustees just at the time preparations are being made for the fair. The intention is to change the time for annual elections so that the new board will either come in some time before or after the holding of the fair.

A Valuable Paper.—As usual, the San Francisco *Journal of Commerce* makes its appearance with the advent of the New Year, in the form of an enlarged edition, wherein the condition of our city trade, local industries, the general business of the country, and, in fact, nearly all of our material and commercial interests during the past year are reviewed and commented upon in an intelligent manner and in an exhaustive way. It is a paper that all interested in our physical well-being and progress should consult with care, and which should he extensively circulated abroad. Mr. Chas. G. Yale contributes to this annual an essay on the inlets, shoals, headlands, harbors, and other topographical and hydrograhic features of the Pacific coast. This article, which has been prepared with great care and with strict regard to well-established facts, should, because of its authoritative character and completeness, become exceedingly useful to government officials and our merchant marine. A large edition of this splendid paper has been issued and we believe mostly disposed of.



THE RUST ARTESIAN WELL BORING MACHINERY.

Smelting as a Business.

Editors Press:—I have had some experience in mining and assaying many kinds of ore, but have had no experience in base ores or smelting them. How long would it take me to learn as a basis for improvement, to assay smelting ores? I am thinking of going to Mexico or Arizona, and I wish to have some experience before starting. Will you state the shortest possible time for obtaining an insight, and also the cost.—M. H. S.

You knew, of course, that assaying and smelting are chemically the same process. It is the "art of separating" substances in the dry way—the reactions that the assayer and the smelter take advantage of being essentially similar to those employed in the wet way.

It is solution by means of fluxes and precipitation, after the reaction has taken place, by gravity. In smelting you have always to deal with silicates accompanying your ores or fluxes. Now to learn making assays by rote, for smelting any given kind or kinds of ore, could be shown you in a few hours; but that would not justify you in undertaking any new or unexpected ores, or products, that might come to your hand indiscriminately, or in setting up for an expert in this branch of practical chemistry.

While it is evident that you have before you the whole field of chemistry, which you must absolutely understand hy practical handling before you can properly understand the business of assaying and smelting—a study and a profession together that will take you many years to acquire—it is also true that you may be so fortunate as to find opportunities where some competent man of experience has worked out the details applicable to special cases, to a degree of simplicity that would enable a Chinaman speedily to acquire the process by rote.

By care and attention to the details of a particular class of ore to which he is accustomed, a laborer will learn to roast his material to an oxide, or to a sulphate, or a chloride to perfection.

You will have to find out first therefore what ores you intend to handle; and presuming it to be gold or silver that you wish to produce, what metallurgical process or processes will answer the best, under the circumstances existing in your mineral district; whether you will employ the cupola, or the reverberatory furnace for reduction; whether you will content yourself with smelting to matte; or whether you will also separate your lead, antimony and silver by other processes.

Not to lead you too far about the bush, you can find good teachers of assaying in this city who will show you the fluxes and how to use them, for from $10 to $100. You can go to the newly completed mining college of the University at Berkeley, for a term, and learn more about the whole matter, in the same space of time, and for the same money, than you can anywhere else.

If you wish to learn how to build a small Mexican mud cupola, and to run it; or how to build, charge, or run the kinds of furnaces employed in Inyo county, or at Eureka or Salt Lake, the most economical, and the surest way of gaining the best metallurgical practice, is to go to the University first, and then at once to the spot where some competent person has worked outthe details. They may apply to your case.

The shortest possible time necessary for "obtaining an insight" will be found to be where you invest your own money in operating smelting works, employing a practical Chinaman for head smelter.

Ducks and geese are very numerous in this section just now, says the Guadalupe *Telegraph*. Swans also abound, and are occasionally shot by our hunters. They are very fine eating.

The Geological Section.

The last meeting of this section was held January 11th, 1879, President Joseph Le Conte in the chair. The following members were present: Profs. Le Conte and Price, and Messrs. Bowman, Gibbes, Harding, Jackson, Keep and Christy. The following gentlemen were elected to membership in the section: Dr. G. F. Becker, Dr. Jas. Blake, Louis Falkman, Chas. G. Yale, R. H. Stretch, John T. Evans and F. Gutzkow.

A very interesting paper was read by Prof. Joseph Le Conte, entitled "The Mono Volcanoes and their Relation to the Glacial Drift." The paper is the result of several visits to this interesting region during the last few years, and as we intend shortly to publish it in full, we content ourselves with a brief extract for the present.

The paper began with a brief description of the Sierras in this region, of the gradually ascending slope of the range from the Sacramento basin, and the precipitous descent to the Mono plains on the east. The evidences of glacial action, the terminal moraines, etc., were mentioned. The waters of Mono lake were described as being strongly alkaline, containing a large excess of carbonate of soda with smaller quantities of chloride and borate of sodium, and carbonate of lime. The origin of these salts could be either the leaching of the basic volcanic rocks in the vicinity, or in the hot springs which still are active in the lake itself. It is certainly the concentrated residue of an immense inland lake which existed there during the glacial epoch. This is proved by the terraces which show the successive limits of the lake, and also by the immense clumps of a peculiar carbonate of lime, to which Clarence King has given the name of thinolite. Its crystalline form is the same as that of gay lussite, of which it is probably a pseudomorple. This supposition gives rise to some interesting speculation as to the changes which have taken place in the lake itself, in order to allow such a transformation.

The terraces, five or six in number, sometimes reaching in hight 600 feet, were spoken of. The bearing of this upon the size of the former lake was developed. The islands in the present lake were described; and the largest one was taken as in some degree typical. It was two and a half miles long hy one mile wide, and 300 feet high. It is composed of a finely stratified deposit of diatomaceous earth, overlying a basaltic rock, which is in some places exposed hy erosion.

The volcanoes, at present extinct, which exist upon the Mono plain, were next described. They are of a hight of from 200 to 2,700 feet. Some of them are as perfect as if just formed. The cone within a cone structure was described, and accounted for as being the result of eruptions taking place at different times.

The probable age of these extinct volcanoes was put as since the end of the glacial epoch, though their activity may have begun before this period.

In favor of this proposition, the following arguments were advanced:

1. The prodigious amount of glacial action which existed at this time would have otherwise croded them almost entirely, while they are on the contrary nearly perfectly preserved.

2. Sections of the plain made hy the creeks, such as that of Rush creek, which may be observed to the depth of 70 to 150 feet, show the evidences of glacial drift, while only upon the top is there any of the volcanic ash.

3. In the craters are found fragments of a rose-colored granite. These were probably ejected by the volcanic gases from the boulder drift which underlies the plains themselves and which was deposited during the glacial epoch.

4. Volcanic action in the region generally seems to have been most active during the tertiary.

The course of events which probably took place was then traced. The ancient lake extended over a vast area now laid bare. The glaciers when they touched the surface of the lake were broken off as icebergs, depositing their rocky debris upon the bottom of this vast lake. The gradual decrease of the body of the water as the glacial epoch came to a close, and the cycle of dryness ensued, was accompanied hy the advent of the volcanoes, and there was a continuation of the dry climate until the present condition of affairs came about. And finally, at the present time the curious fact was stated that there appears to he a gradual rise of the waters of this, as well as of other lakes in the neighborhood, as is shown by the gradual encroachment of the waters upon old trails, fences and other landmarks. This would seem to indicate that the cycle of dryness was coming to an end, and that a change of climate was imminent. Another evidence of increased precipitation was given in the condition of the terminal moraine of the glacier of Mt. Lyell. The front of the debris of the moraine is at its very limit of stability, which could not be unless the glacier had been advancing instead of retreating. The question arises, whether this is a sun-spot cycle or a geological one. Clarence King is of the opinion that it is a larger cycle than the former, as he finds that the snow avalanches of the high Sierras are invading the forests, in many cases tearing down trees that were 250 years old.

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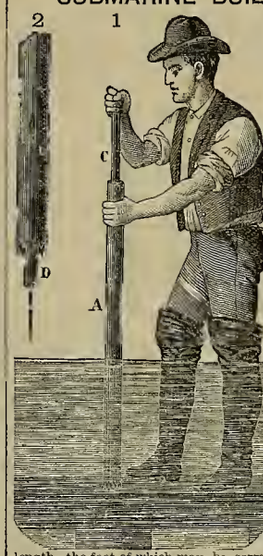

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The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.
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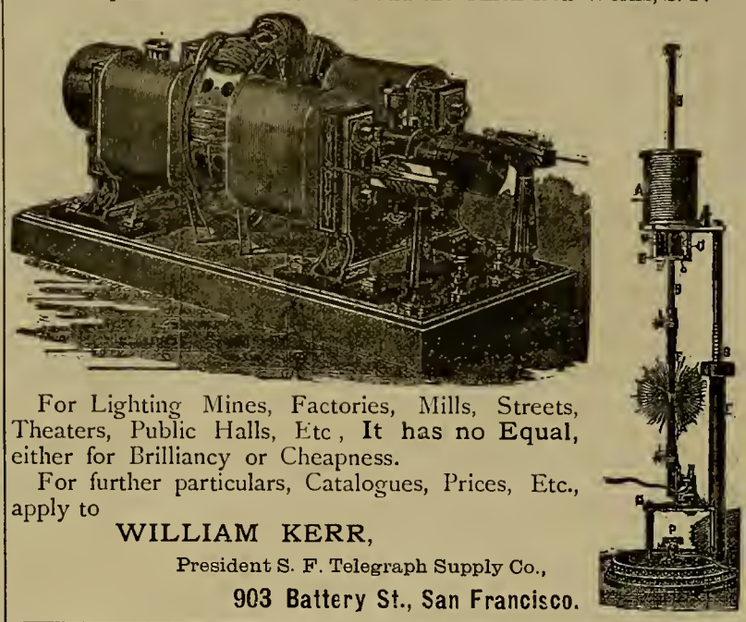

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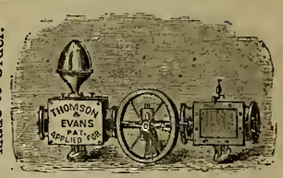

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[Continued from Page 69.]

week more their new tramway will he completed and the ore will be conveyed from the mine to the mill in cars at a cost of about 30 cents per ton, and this will enable Mr. Crane to keep the mill running day and night, regardless of the weather. This company will soon have their smelting furnace ready for husiness, after which the stockholders may soon look for dividends, as this is sure to be one of the best mining properties on the coast, having more good ore now in sight than the company's mill can reduce in two years. At the Northern Light everything is moving along finely under Superintenñent Dunn, who is making the best of progress with his new tunnel, and everybody is waiting anxiously for this company to cut the ledge at this depth, which is sure to open up a wonderful body of ore. The tunnel in the Winthrop is being pushed forward, and when this company cuts their ledge, they will have mor. good ore above them than a 20-stamp mill can reduce in five years. There are many other valuable prospects that only require a few hundred dollars' worth of work done upon them to place them among the foremost mines of the district, as the surface outcrop and assays are extremely favorable.

SISKIYOU.

Cold Weather.—Yreka *Journal*, Jan. 20: The low temperature that has prevailed here, has for the time being put a pretty effectual check to mining operations of most kinds. For over a month past we have had colder weather than during any winter since 1856, the thermometer having heen below zero on two or three mornings, aud most of the time hut little ahove. In 1856, the thermometer ehowed 8° below zero on one morning at the old Yreka hotel, corner of Miner and Second streets, and there was good sleighing nearly all winter, a heavy snow storm having occurred on Christmas day, 1855. In 1852, there was even still colder weather aud more snow. We have had more snow during other winters since 1856 than the present, but the weather did not remain as cold for so long a period. For the past month, we have had a regular Eastern winter instead of a California winter, with its chapgeable weather and snow and rain together.

TUOLUMNE.

The Mines.—*Independent*, Jan. 25: Capt. Lombardo has struck "good rock" iu the Louisiana mine, a three-foot veiu, showing free gold iu several places along it. The "last shot" in the Spring Gulch mine hlew out rock that will go $20 to the pound. This is a good mine—the rock averaging, heretofore, $15 per ton. Should a strong company get hold of this mine, they would find it a paying iuvestment. It is rumored that D. T. Hughes is ahout to start up the Patterson mine again, at Tuttletown; and that arrangements to that effect are now beiug made. The vigorous working of this valuable mine would help brighten times at this end of the country. It is said that, last week, Tom White and Jim Gillis pounded some rich rock from their mine, at Tuttletown. The hand-mortar iu which the rock was "milled" yielded some $1,200.

TRINITY.

The Weather.—*Journal*, Jan. 25: The raiufall at Weaverville, to date, amounts to 10.40 inches. To this add 15¼ inches of snow, or about 1½ inches of water and we have the whole waterfall of the season, 11.64 inches. This will do for a starter, and with what may be expected hereafter, renders the mining prospect for the season pretty good.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—Gold Hill *News*, Jan. 29: The south incline below the 2200 level is now down to the 2300, at which point a station will be opened and the main incliue will then be continued on down to the 2400 level. Just now the little donkey-engine at that winzo has all it can do to boist the rock while sinking the winze and running the north drift on the 2200 level. As sinking the winze to get down on the ore body is by far the most important portion of the work, it will be pressed ahead with all the vigor possible. During the first part of the week the incline passed out of the hard rock and cut into what appears to be another spur from the ore vein, showing good ore aloug with cap-rock, and other indications of the most favorable character. The north drift ou the 2200 level is advancing at tbe rate of three feet per day, the face in good running ground. There now appears to be but little danger of finding water on this level until the connection with tho north shaft shall have been completed.

Ophir.—The daily yield of ore from the 1600 and 2000 levels is being gradually incrcased to meet tbe increased crushiug facilities of the mills on the Carson river, which, owing to the late rain and snow storms, have beeu nearly doubled.

Consolidated Virginia.—The daily yield of ore is being gradually increased iu order to keep pace with tbe increased facilities for crushing, caused by the rise of water in the Carson river. The Trench mill at Silver City was added to the crushing force the first of the week and is now running steadily, crushing about 75 tons per day. The new pumps at the 2150 station of tho C. & C. shaft are in place, and will be ready to start up in a day or two more. An accident to one of the hoisting engines created a delay in the extraction of ore for a day or two during the first of the week.

California.—Daily yield, 280 tons of ore, which is being crushed at the mill as fast as it is extracted. The ore stopes on tbe 1700 and 1600 levels continue to show well and yield rich ore.

North Con. Virginia.—Car-load after car-load of the new hoisting aud pumping machinery is arriving almost daily on the ground and is heing placed in position ready for use as fast as the foundation pieces arrive. The entire machinery having heen set up at the manufactory in San Francisco, and tried before shipping, there is but little delay in putting it together. When the whole is in place ready to run it will cover a space 40x60 feet, resting on a solid bed of masonry 25 to 30 feet in depth. Sinking the main shaft is again makiug better speed. The tank station at the 1600 level is well under way and will soon be completed.

Julia Con.—The flow of water on the 2000 level continues unabated. Owing to necessary repairs to the guides in the main shaft but little hoisting of water could be accomplished during the week. At the same time a large 6-inch pipe to carry the compressed air from the 1200 down to the 1800 level has been put in. This will greatly increase the driving and ventilating power of both the 1800 and 2000 levels. The repairs to the main south drift on the 1800 level are completed, and a large chamber is being cut out for a winze, which is to be sunk in the ore vein down to the 2000 level. Portions of the water standing in the drifts on the 1800 level is disappearing down to the 2000 level.

Hale & Norcross.—The wiuze at the Combination shaft has connected with the top of the large water tank 30 feet helow the station, and the pipes in the lightning drift are heing jointed together ready to send the water from the Hale & Norcross through to the Combination shaft. Everything will be in complete order and pumping in good earnest will be commenced by to-morrow evening if nothing unusual happens to prevent.

Chollar-Combination Shaft.—The water has been drained from the bottom of the shaft and the sinking is making good progress. The flow of water is quite strong, hut ie easily handled by tho skeets, the pumps only taking the water down to the 2200 level. Everything is now in complete readiness, aud the pumps will without doubt begin takiug the water from the Hale & Norcross and Savage by to-morrow evening or the day after.

Sutro Tunnel.—The chances are in favor of hot water being sent through the tunnel, from the Hale & Norcross and Savage nines within the next day or two; also, of an injunctiou to stop it; also, that the pump columns of the Requa or Combination shaft may raise the water to the surface, ignoring the tunnel altogether. Meanwhile the south lateral branch of the tunnel is advaucing in good working ground, and will probably connect with the Julia shaft inside of the next two or three weeks. Total length of the branch to-day, 1,310 feet.

Belcher.—Excavation for the water tanks at the 2560 level nearly completed. Pump-bob at the 800 level is in place and works well.

Yellow Jacket.—New shaft has attained the depth of 2228 feet, aud has just 52 feet further to go to reach its connection with the drift cast on the 2200 level of the old mine.

Savage.—The water still stands in the main incline, 35 feet below the 2000 station. Everything is now iu complete readiness to commence pumping the water through to the Combiuation shaft. This will be probably done by to-morrow or next day at the farthest.

Utah.—The surface works are going steadily forward, the sole plates are ready for the reception of the engine beds, the huge spur wheel is being placed, and the pump-rod will he ready to lower into the incline in a very short time. Sinking the main incline below the 1350 level is making the usual fair rate of progress. It is now down 275 feet on the slope below the 1350 station.

Ward.—The new hoisting engines are all on the ground and are being placed in position ready for service as rapidly as the workmen can perform the job.

Gould & Curry.—Sinking the Osbiston shaft is making slow progress on account of the strong flow of water. It is now down 428 feet.

Bullion.—The face of tbe north drift on the 2400 level is in softer ground, but with no signs of water. Sinking main incline three feet per day.

Trojan.—Daily yield, 40 tons of ore, which is being shipped to the Vivian mill on tbe Carson river for reduction as fast as it ie taken out. The ehipment of bullion up to the 22d instant amounted to $6,880.30. The ore stopes on both the third and second station levels are looking well, and are yielding the usual quantity of good milling ore.

The following are a few of the more noticeable facts connected with the work of exploration in progress elsewhere along the Comstock lode during the past week. In the Morning Star, fiue quartz with some good ore. Water in Best & Belcher strong, and impedes sinking. In Mexican, Overman, Alta and Silver Hill work is going on as usual; machinery, etc., as a general thing, working smoothly and well.

ARIZONA.

Toombstone District.—*Citizen*, Jan 15: Therc is here no abatement of work, success and new arrivals. The saw-mill of the Toombstone G. & S. M. Co. bas been brought to perfect working, and on the 14th they commenced in earnest and are shipping lumber to the mill-site. The saw-mill is in the Huachuca mountains aud the mill is to be erected on the San Pedro about seven miles south of the junction of Babacomari creek. Distance of saw-mill to quartz-mill, 12 miles, down grade; will ship some 10,000 feet a day. The mill, which should soon reach Tuscon now, is to be 10-stamps. The company are at present doing most work on the Tough Nut, and have now exposed their fine ore body the entire length of the claim. On the Empire, Messrs Hooker and Stowe have sunk about 60 feet, defining a fine body of ore. These gentlemen have the claim bonded for $25,000, aud from the results of the work already done there is every prospect for completion of sale. Major Morgan's Merrimac is developing a fine ledge as work progresses. Mr. McCann is at work on the Head Center claim, owned by Messrs. Carpenter, Handy and others, with flattering prospects. This claim is just north of the Contention and adjoins it. Then, we believe, comes the Tranquility, then the Tough Nut; the fortunate owners of the Head Center have undoubtedly got a good property. The Brunswick mine is looking fine. It has been well prospected by two shafts and there are about a thousand tons of galena-silver ore on the dump. The superintendent, Mr. Ackerson, should be here this week, and upon his arrival some 10 to 20 tons of ore will be shipped to San Francisco per contract with Messrs. Edwards & Brown. The ore will be tested and will decide the character of the reduction works to be immediately thereupon erected at the mine. In the meantime work will be steadily prosecuted. The mine was purchased for the company last summer by Mr. R. H. Stretch.

The Juniper Range.—*Enterprise*, Jan. 18: Reports touching the new finds here are encouraging. The ledges are all large and well-defined, aud crop out strongly, some of them for miles. Shafts have been sunk on several of them to depths of 15 to 20 feet, and good assays obtained from the ore. Wood and water is pleutiful and the camp is easy of access. This section of our county has, up to the present time, been almost neglected by prospectors, but after these rich finds, we may expect a rush to the Juuiper range.

Tucson Mines.—*Star*, Jan. 9: The Bushell mine is showing some high grade ore. There are 8,000 to 10,000 tons of ore in sight in the mine, and the vein averages about three feet six inches all the way down. On the St. Louis they are runuing crosscuts each way at a depth of 50 feet. On tho south side have cut into the vein about four feet, showing a fine quality of ore. Ou north side will strike the vein at about 20 feet. Water is somewhat bothersome, hut they are pushing work. The Forsythe aud Rickard mines have just been incorporated and work commenced on them. They bave a pretty vein of 20 to 28 inches of good metal on the Forsythe and a four-foot vein on the Rickard.

Silver District.—*Expositor*, Jan. 18: Glowing accounts reacb us from this locality. The district is 60 miles from Yuma hy way of Castle Dome landing on the south side of the Colorado river; but by crossing the river at Yuma and going by way of the Picacho mill and again crossing the river, the distance is not more than 30 to 33 miles. The mines of this district aro situated from oue to seven miles from the Colorado river, and the ores are nearly all argentiferous galena. The country from the bank of the river affords every facility for good wagon roads, so that four men in from two to four days, can make a practicable wagon road to any of the mines yet discovered.

Outlook for the Year.

The days are filled with occasions for rejoicings. Since Wednesday evening a week ago the rains bave descended in copious measures upon parts of our State whicb have been lingering in tbe regions of droutb and despondency. The downfall has been most gentle and the thirsty earth has gained it all, until, in some parts, it is reported that the water from above has reacbed the moisture from below, and the circle of assured production ie complete. This is a theme for thanks beyond expression; for hoth in its immediate results and in indirect influences the surety of crops this year is of untold advantage to our State.

The indirect advantages to our State of a prosperous year, just at this time, are very marked. The tendency toward the reduction of tbe large holdings, by sales on easy terms to small purchasere will be wonderfully promoted. Half a dozen or more enterprises, which look directly toward increasing the number of our proprietary producers, will be pushed forward with vigor, and those who have already newly embarked upon the work of making new bomes, will find the skies brightened over them and labor lightened by its rewards. It is reported from the East that the clonds of protracted depression and "hard times" are surely lifting. California has never entered the dark valley as deeply as her Atlantic sisters, and she will be the quickest to answer the call to retreat toward the light, if local conditions are but favorable. Again, the industrial depression in Europe is said to be giving many men there the resolution to cast their lot with the nation which is now the world's favorite, tbe United States of America. The statistics of immigration at Castle Garden, New York, for the last few months, show that a tide which has long been unusual there, is rising. The claims of the States will be carefully scrutinized by the more intelligent of this throng of incomers, and California would cut but a sorry figure in their view with the load of a drouth upon her back. Happily this is not to be; and the widely-distributed rainfall will enable all parts of our State to vie with each other to secure their quotas of desirable citizens. California will greet her guests with a broadside of prosperity.

To all the diverse interests of our State, as well as to the tillers of the soil, the word will be: "Go forward." To legitimate mining enterprises, valuable as they are to the agriculturist in building up new local avenues of consumption, there will come increased confidence and capital. One would think that the experience of the last few months, if not former disasters, would lead the people toward the true and real instead of trusting to the sure destruction of street-mining in San Francisco. It cannot but be, that the influence of a good year in our producing interest, will be to attract toward the rewards of legitimate industry, which will be seen on every hand; for all kinds of legitimate business will be stimulated and pusbed forward. Manufactures will assume new life and new onee will be founded. Commerce will plume its wings for new flights, and all the satisfaction of work well done will come to the lot of our wide-awake and progressive people.

News in Brief.

Salmon are very abundant in tbe Russian river.

Colonel Ingersoll made $26,000 by lecturing last year.

Prospecting for gold and silver ie going on within two and a half miles of Calistoga.

Twelve tramps, ranging from 12 to 40 years of age, were taken in at Maryeville hy policemen lately.

About 600,000 tons of coal have been shipped from Astoria to San Francisco during the last year.

Subscriptions to the new four per cent. loan are being made at the rate of about $12,000,000 per day.

The water in the Straits of Gibraltar, at the depth of 670 fathoms, is four times as salt as at the surface.

The Coquille river wae frozen over at a point near its mouth during the late frost, the firet time for many years.

A Prague chemist has invented a mirror which reveals the conteuts of wine casks without removing the heads.

An English paper says that American-made lamps are more elegantly designed, and better finished, than their own.

Dye and Anderson, the murderers of Tullis, have been sentenced to be hanged at Sacramento on the 13th day of March next.

W. T. Tevis, a hunter of Petaluma, is said to have earned $350 in one month this season shooting quail for this market.

Portions of the interior prese earnestly admonish the farmers to avoid, as far as possible, running into debt at the country stores.

M. De. Lesseps has declared the flooding of the desert of Sahara practicable. Important Roman remains have just been discovered there.

The Santa Barbara *Press* thinks that the question of "pipe lines" will soon become an important one in the oil belt of southern California.

Gen. Bidwell is having arranged, under his own supervision, an immense poultry-yard, which is to cover over 100 acres of land, near Chico.

The honey crop of San Diego county in 1878 was more than 787 tons. San Diego county produces more honey than all the rest of the State taken together.

Every tenth person in a Hungarian town of 20,000 inhabitante has recently been attacked with diphtheria, and 927 bave died. The malady also prevails in Vienna.

The weather in Great Britain continuee severe, and the number of distressed poor ie greatly increased. In Paris traffic is almost suspended on account of the snow.

There are 272 telepbone statione under the direction of tbe German post-office authorities. The instruments work perfectly over lines 50 kilometers long—say 32 miles.

Great alarm prevails in Europe concerning the rapid spread of the black plague, and the most energetic measures are being taken to confine it to the regions already infected.

The banks of Montana paid $63,000 in express charges on gold and silver bullion shipped out in 1878, and the weight of the express matter brought into the Territory was 500,000 pounds.

The Oakland *Times* believes that the policy which has been followed by the Regents of the State University since the day of their organization has been far-seeing and wise.

Thirty years ago the profession of mining engineer was almost unknown in the United States; to day the American Institute of Mining Engineers numbers over 700 members.

France forbids the manufacture or sale of earthenware, whether French or foreign-glazed, with a layer of lead oxide melted or imperfectly vitrified, and so liable to yield lead to weak acids.

Engineers of steamships have found that the best lubricants are glycerine for the cylinders and castor-oil for the bearings. When castor-oil is used the main hearings seldom become heated.

Thus far the borings on tbe French coast in connection with tho proposed English Channel tunnel confirm the possibility of the execution of the scheme. The geological cousiderations are all favorable.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the Mining and Scientific Press, DEWEY & CO., Publishers and U. S. and Foreign Patent Agents.]

By Special Dispatch from Washington, D. C.

211,737.—Machine for Cleaning Fiber—T. McAuley, S. F., Jan. 28, 1879.

211,774.—Compressed Air Water Elevator—John Patten, Spruce Mountain, Nev., Jan. 28, 1879.

211,772.—Apparatus for Washing Chloridized Ores—D. J. O'Harra, Reno, Nev., Jan. 28, 1879.

211,702.—Cultivators—P. S. Russell, Riverside, Cal., Jan. 28, 1879.

211,750.—Rotary Vacuum Engines—L. B. Laurence, Monticello Cal., Jan. 28, 1879.

211,731.—Diaphragms for Ore Furnaces, M. D. Haskins, Guerneville, Cal., Jan. 28, 1879.

211,721.—Non-corrodible Composition for Quicksilver Condensers—H. B. Eames, S. F., Jan. 28, 1879.

211,030.—Horse Rake—Abby & Brammer, Livermore, Cal., Jan 28, 1879.

211,893.—Apparatus for Washing and Amalgamating Ores—C. Duhem, S. F., Feb. 4, 1879.

211,017.—Waste Pipe, Cut-off and Valve—Levake & Grubb, S. F., Feb. 4, 1879.

211,883.—Hoisting Register—H. C. Behr, Virginia City, Nev., Feb. 4, 1879.

211,885.—Railway Track—A. Bowman, Seattle, W. T., Feb. 4, 1879.

The "Great Basin."

John Muir, lectured on "The Great Basin," at Sacramento, January 14th. He was along with the Coast Survey triangulation party, which worked last summer between the Sierra Nevada and the Rocky mountains. Whether he has a large audience or a small one, Muir is equally certain to entertain it. In this instance it was quite a large one, including the Literary Instituto of Sacramento; and he kept it in close attention for two hours. "Mr. Muir," says the *Record-Union*, "is a simple, unskilled talker, a man who lives in the free air of the mountains, and whose highest ambition is to delve into the wondrous mysteries of nature. He talks to his audience simply, as if speaking to a small circle of friends."

This falls as far short of doing him justice in one way, as the oft repeated allusion to him as a "distinguished geologist," overrates him in another. He lays claim to nothing of the sort. Muir, is a poet and a philosopher, a rare conversationalist, and a skillful writer; withal a naturalist, and a geologist of modest pretensions with a good deal of merit, but, eapecially, entitled to the great credit of interesting everyone in his subject. He is truly, as has been said, the "Thoreau of the Sierra," and like Lassen, the Pioneer; Marshal, the Gold Finder; Adams, the Grizzly Bear; Fremont, the Hero; John Oakhurst, the Gambler; King, the "Mountaineer;" Hutchings, the "Yosemite Man;" Whitney, the great "Fisherman;" Avery, the gentle Word-Paiuter, and Seabough, of the San Andreas *Independent*, he has written his mark upon the olive hlue and snowy mountain side of the Californians.

Mrs. Derby, the widow of that genial humorist, Lieutenant "John Phœnix" Derby, went to Washington five years ago with $60,000, was persuaded to invest it in real estate, and has lost it all, and is said to be on the verge of insanity in consequence.

The Duty of the Hour.—Lest any reader should forget it, we mention the peculiar fitness of the season for renewing old subscriptions and making new ones to the Press. In going forward with our journal, we need the help of our patrons both with mind and money. Do not forget to send the printer his due, as the aggregate of small individual amounts will give him a force that wil make the types fairly dance into the lines. We trust that only a hint will be needed to rally the dollars, for with them assured we have a thousand themes to occupy our columns. Let all step up promptly to the Captain's office and then we will go out on deck for another year's voyage —*January 1st, 1879.*

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Artesian Wells Wanted.—Parties who are prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of the Reading Ranch, Anderson, Shasta County, Cal.

Settlers and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Examine the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.04. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Henry R. Ewald is our general correspondent and agent for Arizona.

Chew Jackson's Best Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

Wednesday M., January 29, 1879.

BAGS—Jobbing.

Eng Standard Wheat	9 @ 9½
Neville & Co.	
Hand Sewed, 22x36	9 @ 9¼
24x36	—@—
23x40	11 @ —
Machine Sewd, 22x36	9 @ 9½
Flour Sacks, halves	8½@10
Quarters	5½@ 6½
Eighths	3½@ 4
Hessian, 60 inch	12 @13
45 inch	8½@ 9
40 inch	7½@ 8
Wool Sacks,	
Hand Sewed, 3½ lb	47½@50
4 lb. do	52½@—
Machine Sewed	50 @—
Standard Gunnies	13 @14
Beau Bags	7½@ 8½

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits	
2½ lb cans	2 00 @—
Table do	3 00 @—
Jams and Jellies	3 50 @—
Pickles, hf gal	3 15 @—
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef,	
2 lb. doz	4 00 @—
do Beef, 4 lb. doz	6 50 @—
Preserved Mutton,	
2 lb. doz	4 00 @—
Beef Tongue	6 50 @—
Preserved Ham,	
2 lb. doz	6 50 @—
Deviled Ham, 1 lb,	
doz	5 50 @—
do Ham, ½ lb doz	3 00 @—

COAL—Jobbing.

Australian, ton	8 00 @—
Coos Bay	6 50 @ 7 00
Bellingham Bay	6 50 @—
Seattle	6 00 @ 6 50
Cumberland	14 00 @—
Mt Diablo	4 75 @ 6 00
Lehigh	13 50 @—
Liverpool	7 50 @ 8 00
West Hartley	10 50 @—
Scotch	10 50 @—
Scranton	11 50 @—
Vancouver Id	7 00 @—
Charcoal, sack	75 @—
Coke, bbl	60 @—

COFFEE.

Sandwich Id, lb	— @—
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Mauila	17 @—
Ground, in cs	25 @—

FISH.

Sac'to Dry Cod	4½@ 5½
do in cases	5 @ 6
Eastern Cod	— @—
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls	22 00 @—
Hf bbls	11 00 @—
Mackerel, No. 1,	
Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @—
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd Hlg	70 @—

LIME, Etc.

Lime, Sta Cruz,	
bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @—
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50

NAILS.

Ass'ted sizes, keg	2 90 @ 3 00

OILS.

Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @—
do. No. 2	1 05 @—
Baker's A A	1 25 @1 30
Olive, Flagniol	5 25 @5 75
Fossel	4 75 @5 25
Palm, B	9 @—
Linseed, Raw, bbl	72 @—
Boiled	75 @—
Cocoanut	55 @—
China nut, cs	70 @ 72½
Sperm	1 40 @—
Coast Whales	40 @—
Polar	45 @—
Lard	90 @1 00
Oleophine	22 @ 25
Devoe's Brlt	22 @ 25½
Photolite	@—
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @—
Downer Ker	37½@—
Elaine	37½@—

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@—
Putty	4 @ 5
Chalk	1½@—
Paris White	2½@—
Ochre	3½@—
Venetian Red	3½@—
Averill Mixed Paint, gal	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	5 @ 5½
Hawaiian	7 @ 7½

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @—

SOAP.

Castile, lb	10 @ 10½
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal., ½ lb glass	1 50 @—

SUGAR, ETC.

Cal. Cubo, lb	11½@—
Powdered	11½@—
Fine crushed	11½@—
Granulated	11 @—
Golden C	9½@—
Syrup, kgs	70 @—
Hawaiian Molasses	25 @ 30

TEA.

Young Hyson, Moyune, etc	27 @ 3.
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Fooo-Chow O	35 @—
Japan, 1st quality	40 @—
2d quality	20 @ 25

METALS.

[WHOLESALE.

Wednesday M., January 29, 1878.

Iron.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
Copper.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 29
Sheathing, Old Yellow	— @—
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
Nails.—	
Assorted sizes	2 90@3 00

LEATHER.

[WHOLESALE.]

Wednesday, M., January 29, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 00
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornollian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ulmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 25
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @ 9 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
eather, Harness, lb	35 @ 38
LFair Bridle, doz	48 00 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	18 @ 21
Wax Side	17 @ 80

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, January 29, 3 P. M.

Silver, 2½@2¾. Gold in New York, par.

Gold Bars, 890@910. Silver Bars, 3@18 ₱ cent. discount.

Exchange on New York, 35, on London bankers, 491@49½. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 87½@89.

London Consols, 94 7-16; Bonds, 107¾.

Quicksilver in S. F., by the flask, ₱ lb, 40@41c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco. Location of works, Cherokee Flat, Butte County, California.

Notice.—There is delinquent upon the following described stock, on account of assessment (No. 10), levied on the 20th day of December, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amt.
A. Casselli	17	4608	$230 40
L. Nussbaum	105	50	2 50
E. I. Pfeiffer	106	430	21 50

And in accordance with law, and an order of the Board of Directors, made on the 20th day of December, 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, on Tuesday, the 18th day of February, 1879, at the hour of two o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, No. 318 Pine Street, Room 6.

Griffith Consolidated Mill and Mining Com-

pany.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 2nd day of January, 1879, an assessment (No. 1) of twenty cents (20c) per share was levied upon the Capital stock of the Corporation, payable immediately to the Secretary, at the Office of the Company, Room 48, 330 Pine Street, San Francisco, California.

Any Stock upon which this Assessment shall remain unpaid on the 26th day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, March 26th, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

GEO. M. CONDEE, Sec'y.

Office, Room 48, 330 Pine Street, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of January, 1879, an assessment (No. 15) of One Dollar per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the Company, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal., or the Assistant Secretary at the office No. 9 Nassau St., New York, N. Y.

Any stock upon which this assessment shall remain unpaid the twelfth day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the twelfth day of March, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Sec'y.

Office, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 6,) levied on the 19th day of November, A. D., 1878, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Boring, I C	32	1200	$60 00
Bohn, John	150	200	10 00
Lehmann, C	129	2750	137 50
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Storer, J F, Trustee	58	250	12 50
Schmitz, P	205	400	20 00
Turner, J W	65	200	10 00

And in accordance with law, and an order of the Board of Directors, made on the nineteenth day of November, A. D., 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, Cal., on Tuesday, the fourth day of February, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

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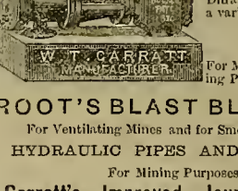

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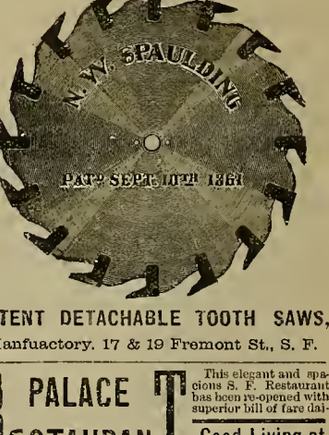

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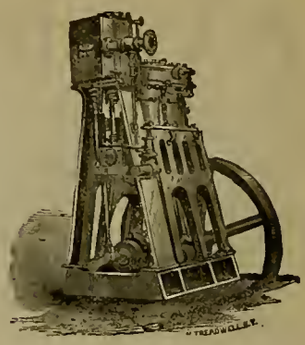

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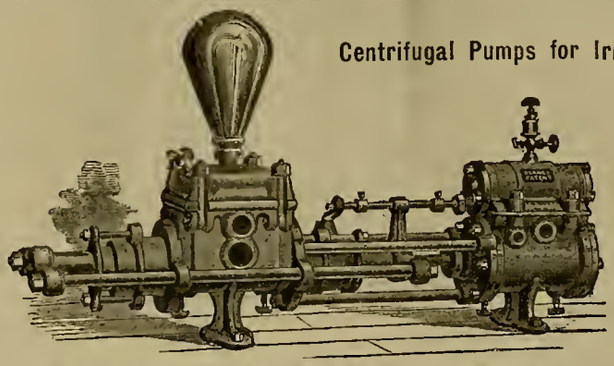

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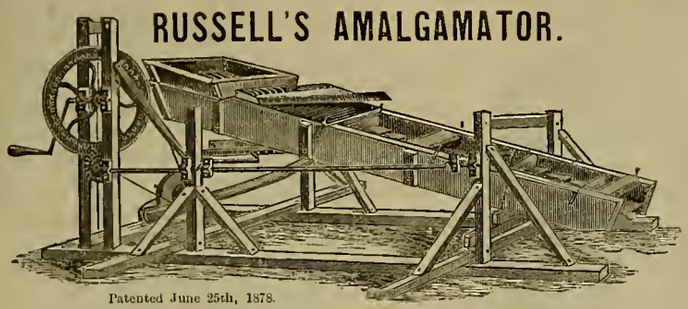

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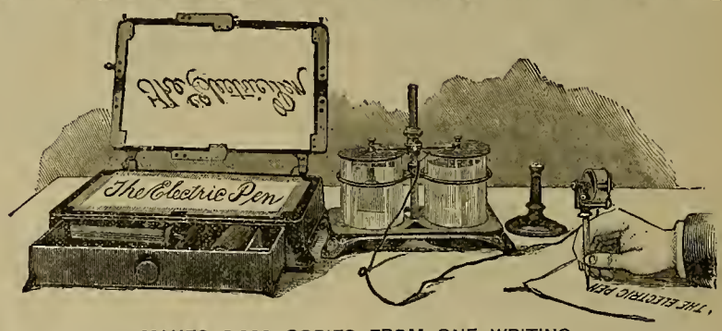

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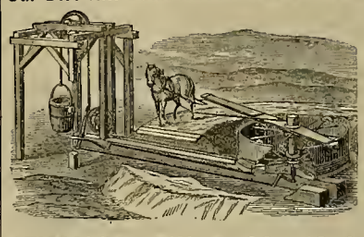

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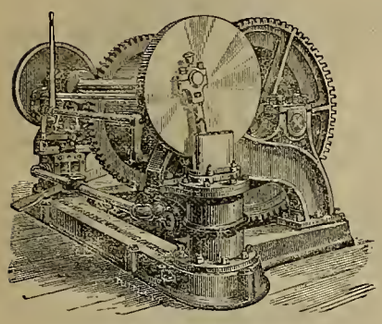

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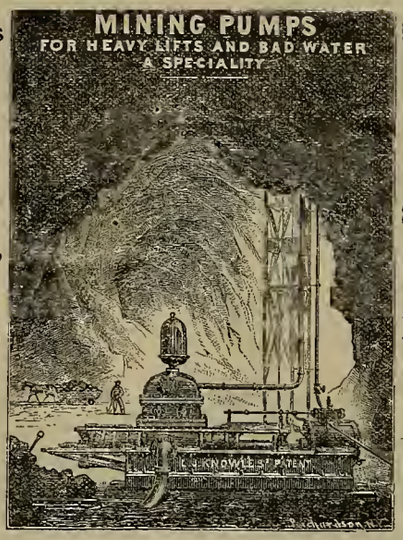
Air Compressors AND AIR COLUMN, STEAM PUMPS, AND Pump Column, STEAM FIRE ENGINES, AND Hose Carts.



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VULCAN BLASTING POWDER.

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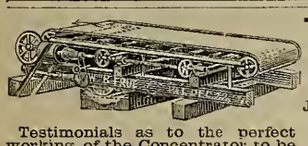

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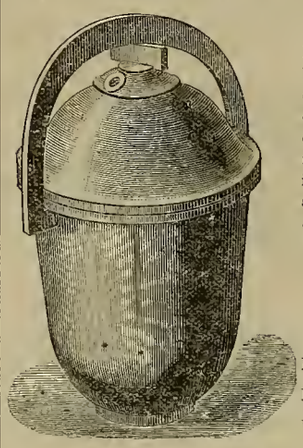
THE NEVADA OVAL TOP RETORT.



The advantage of this Retort over the OLD FLAT PATTERN is, that it can be filled full of Amalgam, thereby holding more than the old style, besides avoiding all danger of an explosion owing to the crown space in the cover which allows for the expansion. They are made extra heavy, WELL GROUND in the joints, and are furnished with a strong Norway clamp, having a wrought iron key which can be driven in or out of place by a single stroke of a hammer.

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We Make Seven Sizes, as follows:

Number or Pints	1	2	3	4	5	6	10
Holds Pounds Quicksilver	12½	25	38	50	63	75	125
Weight each, 10 lbs	15	18	25	31	44	65	

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GROUND INSIDE.

Size—Quarts	½	1	2	4	6	8	12	16
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SAN FRANCISCO, SATURDAY, FEBRUARY 8, 1879.

VOLUME XXXVIII Number 6.

Oil Wells of Ventura County.

The searchers after petroleum in our central southerly coast counties are deserving of success, and according to recent reports from that quarter some of them are beginning to realize a pretty good share of it. According to the Ventura *Signal* they have struck a body of oil in the Los Angeles well on the Little Sespe, which, at a depth of 1,514 feet, flows 110 barrels per day. This oil is represented to be perfectly clear and of the best quality, with a specific gravity varying from 39 to 41 degrees. After filling all their tanks, having a holding capacity of 300 barrels, the flow has been stopped till additional tankage can be obtained. Six months have been spent in boring this well. At 1,387 feet 10 barrels per day was got, and a good show thence to the present depth. About 85% of the product here is used for burning, lubricating, etc., and the balance for fuel; being also thought to contain much paraffine. The oil belt here occupies a sort of basin, of which the Los Angeles company own 820 acres, besides the Tar creek tract, considered still more valuable. In this basin, where it is believed 300 wells might be sunk without crowding, is situated the "Petroleum Park" claim of 16 acres, also very promising land which is owned by San Francisco and Los Angeles parties. Machinery is about to be placed on this property for well boring, a somewhat costly road having been built for the purpose of getting it in, also shops, suitable buildings for the accommodation of workmen, etc. This locality is distant from Ventura 25 miles, and is elevated above sea level 1,525 feet. It is, however, but 225 feet above the mouth of the canyon, from which it is distant 7,000 feet. The Sespe, a branch of the Santa Clara river, carries a considerable quantity of water and runs close by the well. The company will pipe their oil to the mouth of the canyon, where their receiving tanks will be erected. Ultimately it is expected that the oil will be piped all the way to Ventura, the country being favorable for the purpose. As other wells will be opened here, the product of this locality will amply justify the expense of laying down a main pipe to the above point. To this pipe "Petroleum Park," and various other fertile districts in the vicinity, would become tributary. In this mild climate such pipes would never freeze nor would the oil clog. At Ventura, it is presumed that extensive oil refineries would be built, greatly benefiting that place and the surrounding country. With this mineral oil in such abundance, it would probably soon supersede coal and wood as a steam generating fuel. Capt. Roberts, Superintendent of the Los Angeles company, using it successfully in the furnaces at the well. Four barrels of crude oil go as far as two and a half cords of good live oak wood. This oil the company can, and, in fact, proposes to furnish in any quantity at one dollar per barrel. The gas companies of the larger cities will also, it is thought, substitute petroleum for coal, as there is more gas in a barrel of this substance than in a ton of coal. Schooners can be so constructed as to carry oil in tanks, which may be filled from pipes on the wharf, or it can be carried cheaply as ballast. After the burning fluid comes the lubricating oil, which is graded from the finest used on sewing machines, etc., down to car axles and wagons. It is in use on the Central Pacific road, and the "Star Oil Company" is supplying some large establishments in San Francisco. The refuse is used for fuel.

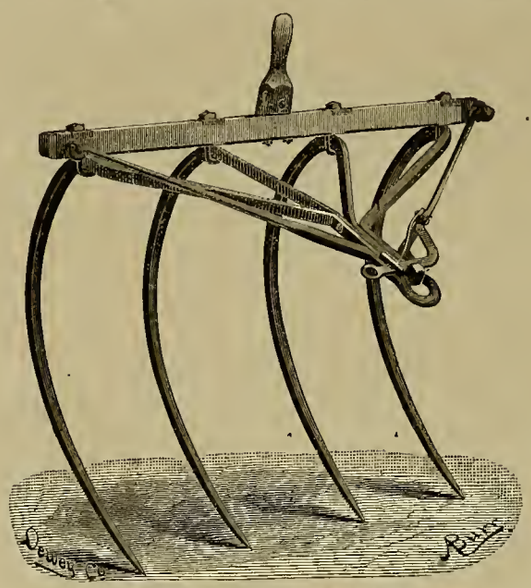
CAVES IN AMADOR.—A remarkable cave was discovered not long since at the mouth of a marble quarry near Jackson, Amador county. It appears now from a notice in the *Ledger* that another cave has been found in that vicinity, being on the Consumnes, opposite Slug gulch. It has been explored for a distance of 3,000 feet, and no end found. The passage is small, as are also the chambers which have been explored. But the mystery of the cave is that a strong current of air sweeps through the main passage, making it very difficult to carry a torch. Another inexplicable circumstance is that far below can be heard the noise of falling water, as if rushing through the rocks to some outlet which has not yet been found.

The Allen Governor.

This governor has won several prize medals, on different exhibitions, and is especially useful in controlling and regulating all kinds of link motions and variable cut-off engines—including the Corliss (to which it is particularly adapted), and all the engines subject to great variations. Engines to which it is attached run with the throttle wide open. And to whatever changes or steam pressure, or changes, however sudden, in power used, the engine may be subjected, it should not vary more than one revolution as long as there is sufficient steam to do the work. These governors may be seen at the Pacific Iron Works, and their operation is as follows:

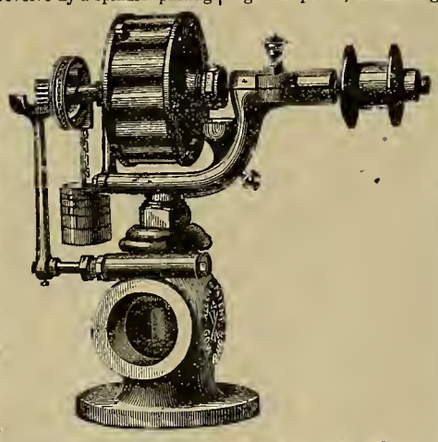
Within a corrugated cylinder, which has small projecting ribs on its interior periphery, and which is partially filled with oil, a paddle-wheel is caused to revolve by a spindle passing through one end of the cylinder, driven by a belt communicating with the fly-wheel shaft. The tendency of the revolving paddle-wheel is to cause the cylinder to move in the same direction. On the opposite side to the revolving spindle is a trunnion or short spindle fixed to the cylinder, attached to which is a wheel carrying a set of movable weights suspended by a chain, the speed of the engine being regulated by the number of weights. Attached to the wheel and keyed on the end of the short spindle is a pinion revolving with the cylinder, and working in a toothed sector, the arm of which, being fixed on the spindle of the throttle-valve, opens or closes it as the oil cylinder moves with the paddle, according to the variation of load thrown on the engine. When used with variable cut-off engine, the arm is attached direct to the cut-off.

From the above brief description of the Allen governor, it will be readily understood that its principles are in accordance with natural laws. It will be seen that the weights are raised and lowered in a nearly vertical line, and unlike those of other governors, remain the same at every point of their suspension. The high rate of speed used acts advantageously in making the governor very sensitive; and, all parts being lubricated, it works with the smallest amount of friction. The centrifugal or ball principle being entirely abandoned, the movable weights are suspended as easily at one point as another, by the action of the paddle-wheel in the oil cylinder; and from this fact, together with others peculiar to its construction, it offers a direct saving of fuel, and a considerable increase in the power of the engine.



HARRISON'S IMPROVED HAY FORK.

The peculiar action of this governor, which admits of the use of a valve of large area, thereby admitting to the engine cylinder the greatest possible boiler pressure at each stroke of the piston, has produced great results by being attached to old engines, greatly increasing their power, or effecting a direct saving in fuel, and in hundreds of instances doing both. In running an engine with this governor, with high or low pressure of steam and with all variations of power, the throttle is opened wide in the morning and remains so until closed at night, thus relieving the engineer from all labor and care, except keeping the engine oiled, and giving him a great deal of time for other duties.



THE ALLEN GOVERNOR AND VALVE.

Allen's patent governor valve is constructed with a double disc in a tubular form, and is perfectly balanced, there being no spindle, as in the ordinary throttle-valve, to interfere with its equilibrium. The valve is moved by means of a lever, and is opened and closed by a rocking motion of a steel spindle, which is covered with brass, ensuring the greatest possible durability.

THEY have a man in Bodie, who, some years ago, occupied an $800,000 marble front building, and did a large business in New York, and who is now working for a livelihood.

Harrison's Horse Hay Fork.

We illustrate herewith a horse hay fork patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, by Edmund Harrison, of Hollister, California, who is an inventor also of a derrick and unloading uet. The fork is intended to lift large masses of hay or straw for the use of the threshing machine, or stacking or loading.

The tines are bent so as to grasp the load to the best advantage. These tines pass through the eyes upon the cross-bar, which keep them well apart and steady them. Above the cross-bar the tines are continued and brought together and strongly secured at one point, as shown. Strong eyes are secured to the outer ends of the bar and a triangular frame is formed of two other bars or arms, which are secured to these eyes at the ends of the bar so as to allow the fork to swing, and these arms meet in the middle above the head of the tines, forming a strong eye from which the whole is suspended.

It will be manifest that when suspended, the weight of the fork tines will cause the head to swing forward and allow any load to be discharged, unless it is confined in some manner. In order to do this, a hook is formed at the head of the fork, so that this hook just swings clear between the sides of the arms where they are bent to form the eye. A latch is pivoted to one of the arms and extended across the back of the other arm, so that when it is passed upward into the hook, it will prevent the fork from swinging forward, and as the latch rests across the small space between the arms, it will be seen that it will have great strength to resist the strain upon the fork.

Another great advantage possessed by this latch, is that it lies flat across the back of the fork, and does not project so as to catch or interfere with anything, if it is desired to hoist alongside of a mast or vertical post. In order to keep this latch up and make it catch on the hook, a spring is employed—secured to one of the arms—and this keeps the latch in position. A guiding staple on the opposite arm holds the latch in place, and limits the motion.

When it is desired to discharge the load, all that will be necessary is to pull the cord attached to an eye in the outer end of the latch. By this construction, the fork is made very strong, the tines being formed on a single piece each, with a liability to split, and it is very simple and cheap. The latching device is very strong, and by its position across the space in which the bead swings, it is capable of resisting a heavy load, and at the same time is entirely out of the way.

THE MANUFACTURE OF SILK.—This industry has been introduced finally in the form of a novelty to Californians, which may be seen at the corner of Stockton and Post streets, near Horticultural hall, where a Frenchman from Lyons is actually at work making silk. And the novelty consists in the exceedingly simple and modest, yet evidently practical and successful manner in which the industry has taken shape. He has a light and simply constructed hand-loom worked by treadles; and at the present time turning out lining silk. The simplicity and lightness of this French machinery at once attracts the eye. The wonder is that a single workman, with a simple and inexpensive machine, can compete successfully with wholesale manufacturers. Such we are assured not only is the fact, in the old world, but will prove to be likewise in California.

ALTITUDES OF AURORA AND BODIE.—Measurements recently made with a carefully adjusted aneroid barometer, show the town of Aurora, Esmeralda county, Nevada, to be 7,850 feet above sea level, and the town of Bodie, Mono county, Cal., 8,950 feet, or 1,100 higher. The top of Mount Davidson is 7,838 feet, and to persons traveling from Virginia City to Aurora it seems almost incredible that the latter place is as high as that peak.

GENERAL GRANT and party have left Suez for Bombay.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Chilean Gravels and Gold Washings.

Editors Press:—The articles you published on "Hydraulic Mining," by Mr. Bowie, as also those by Mr. Hittel, on the "Dead Rivers," and others, are read and studied here with the greatest interest, since people here are beginning to be convinced that Chile is quite as rich as California in gold gravels; in fact, Chile is a

Duplicate of California

In its climate, geology, parallel mountain ranges, long line of sea coast and mineral wealth.

From the Chilean historian of the time of the conquest we gather that the Chilean Indians paid a yearly tribute of 1,400 pounds of gold to the Inca of Peru. Almagro, a Spanish officer, seized the tribute on its road to Cuzco, the residence of the Inca, and divided it amongst his soldiers. No doubt this gold induced him to march south to Chile, across the still dreaded desert of Atacama, to secure the mines whence this gold was produced. The tribute was cast into small bars of gold, marked with the Inca's stamp, and it was escorted to Peru by 400 horsemen, and there were rejoicings at the principal towns on the road. With the treasure there were nuggets worth $700 and $500.

The Indians of Coquimbo having revolted and killed the Spaniards there, those of Marga-Marga asked permission to retire from the mines, and the book of the municipality of Santiago, says as follows: Friday, 1st of November, 1549. The miners of Marga-Marga have written to this municipality that they desire to quit the mines, hearing what has passed at Coquimbo, but should they do so, the King of Spain would lose his royalty of one-fifth, which, valued according to the ordinance of March 3d, would be $64,973, and consequently the total extraction from Marga-Marga, would be some $300,000 yearly. Immediately after founding the capital of Chile at Santiago, the Spaniards commenced to work (A. D. 1549) the gold washings at Marga-Marga with Indians, and extracted such

Large Amounts of Gold

That it was weighed in the steelyard. Some Spaniards had as many as 600 Indians working for them, and as a result the gold was freely lavished on all sides.

At Quilacoya, the Governor Valdivia, employed from 10,000 to 15,000 Indians, and he pushed his conquests still further south and founded the "Seven Cities," in order to work the gold washings at Aranco, Augol, Canete, La Imperial, Valdivia, Osorno and Villarica. The Indians revolted and reconquered their Araucanian territory, and destroyed the Seven Cities, and still remain in possession of a great part of the southern territory. A foreigner now and then enters amongst the Indians, but he must beware lest he attempt to look for, and much less to work for gold. The traditions of their having been made to work for gold still exist.

There are abundant data to prove that the gold washings were

Worked on an Immense Scale

By the early Spaniards, as the records mention well-known places, a few of which I have visited; and since attention has been given to the subject, I may state that the work was done almost entirely in the river beds, and perhaps some ground sluicing, but the beaches are untouched.

Gold continued to be extracted by the pan and by ground sluicing till the discovery in California, which induced the greater part of the Chilean gold miners to go there, and since that period consequently our washings have been almost idle.

The idea prevalent here has been that the gold washings must be exhausted after 300 years working, and the jewelers who have latterly purchased the small quantities extracted these last 15 years, tell me they never had even the curiosity to visit the localities whence it was produced. It is true, however, as a rule that the miners refuse to state.

It has appeared impossible both to foreigners and natives, that such an

Extensive Gold Field

As Marga-Marga, 10 miles long by five miles wide, could exist almost at the outskirts of Valparaiso, the principal seaport of Chile, without their being aware of its value. I may add that there was no knowledge of such a mode as the hydraulic system to wash down the gravel, and to have stated that 1,000 tons of it could be washed daily was to be set down at once as an arrant liar. It was Paraff alone who was to do wonders and pay off the national debt of Chile.

It has taken three years continual writing, speaking, showing data to parties, and convincing some by taking them to see the gravel deposits, to induce a partial belief. We are on the right road at last, and people are commencing to prospect and bring samples from different quarters. H. A. Holcomb has contracted for some $80,000 the construction of a canal, the pipes, flumes, sluices, etc., necessary for the Nibliuto washings near Chillan, and John Simpson is in treaty for similar works at Caren. There is one

Point of Difference

Between the Chilean and Californian gold washings. Ours are located west of our coast range, and near the sea, at the outlet of some stream or river, and they extend from the Straits of Magellan, where Messrs. Hamilton & Shanklin worked, up to our most northern city, Copiapo, towards which, however, water is scarce. We do not appear to have what corresponds to your Blue lead at the foot of our snowy Cordilleras. Our coast range is traversed by numerous gold ledges which appear to have been the sources of our gold gravels. I should say our dead rivers must have run from Magellan straits to the north, and our marine current still runs towards the equator, both inversely to yours, but in a similar manner towards the equator. The dead rivers must have run to the west of our coast range since the gravels are deposited on that side, and not on the eastern fall or central valley; they account accordingly for the finding of our gravels all close to the coast, and in every case, I believe, traversed at right angles by the live streams running into the sea, which lay bare, and in many places show the bedrock upon which the gravel rests. These remarks refer to the central portion of Chile between Coquimbo and Concepcion.

In the South

Or Indian territory it would appear the gold is found right across from the foot of the Cordillera to the coast, but we have not heard of any deep gravels. Our river beds, as I said before, have been worked, where the sand or gravel was shallow and there was little water, but not in any places where the sand is deep and pumping or any machinery is required.

We are unfortunately separated from you by long distance, difference of language, and consequent ignorance of your mines and mining progress, and bad postal arrangements.

Mining Claims,

However, are easily and cheaply secured, and the law will protect you in holding your mines. Your capitalists and miners will find a new field where they will make fortunes as well as give new life to Chile, now suffering from a severe commercial crisis and from the low price of copper, to the mining of which all the energy and capital of the country has been devoted, and which delays the working of the gold washings and mines, for which latter there is not one single stamp mill yet erected. American eagles have been sold as high as 30, premium and drafts on the United States in proportion. There will be a demand for hydraulic mining engineers, and those with proper credentials will secure first-class positions. Miners who understand working monitors, erecting flumes, tail sluices and practical hydraulic mining will do well, as, also, those who understand river-bed workings on their own account will find plenty of room. The rest, as regards climate, security and government are satisfactory. Those who are not doing well in California and want a new field may come. They seem to consider almost any arrival from California as an authority, and one lately arrived gave an unfavorable opinion on a river-bed claim on the Marga-Marga stream, without knowing anything of or seeing the gravel deposits above the claim; surely in proportion to the richness and extent of the gravel benches, so will the river-bed claims be. Finally, therefore, we require capital and competent hydraulic and river-bed miners to give us new life, and I consider we can offer them good prospects. John P. Sewell.

Valparaiso, Nov. 22d, 1878.

Heat of Thermal Springs.

Editors Press:—The article in your issue of January 31st, under the caption of the "Heat of the Comstock," shows that Prof. Church's careful studies of the heat in the Comstock mines have rendered a service to science, by demonstrating that it is not due to radiation and conduction of the stores of heat of a once molten mass of contiguous rock.

Thoughtful students of the

Facts Developed by Mining

Have long seen that the more they are considered the more they appear incompatible with the generally received notions that all metamorphic rocks have been subjected to a semi-vitrifying heat, and all primitive and crystalline rocks have been in a state of *igneous fusion*. The same facts have driven into the background the formerly prevalent idea of the injection of quartz, molten quartz, as veins, into rock fissures. It may be said, even, that advanced students of nature begin to doubt whether the heat of all thermal springs and of volcanoes is derived from that hypothetical store of the molten interior of this once incandescent globe.

Convinced that another solution for these facts is required, I beg, through your columns, to add the following as

Correlative

To the conclusions of Prof. Church, given in the article above mentioned.

A mile south of the town of Cherry Creek, White Pine county, Nevada, on the sloping mesa, at the foot of the eastern slope of the Egan range, are San Rafael hot springs, belonging to the San Jose Mining Company, where, under my own observation, the out-flow of the water has been proven to be substantially uniform, but the temperature varying from 97° to 130° Fahr. This variation in temperature is at irregular intervals of time, for which there is no law of periodicity. The temperature of the water shows some sympathy with certain approaching changes in the weather, increasing on the approach of a southerly wind storm.

Upon these facts I make the following

Observations:

1. Since the out-flow of water is uniform and its temperature variable, the source of heat must be variable.

2. This seems probable only in one of two ways: Either the water must remain in contact with the heating surface longer at sometimes than at others, or this surface must be sometimes better than at others.

3. The steadiness of the outflow and the absence of periodicity in its changes of temperature, forbid the supposition that the water remains sometimes longer than others in contact with the heating surface of uniform temperature; by reason of a change of its route, or of intermittent storage.

4. We must, therefore, conclude that the temperature of the heating surface varies.

5. But if so, the heat cannot be derived from that great hypothetical reservoir of central heat; for reason and experience show that both radiation and conduction from this source must be so absolutely uniform as to make the temperature of the interior of the earth, at equal depths, all over the globe nearly equal. As an example, within my own observation at San Jose mines, Egan, Nevada (at the head of a tunnel 1,200 feet long and 450 feet below the surface, with its mouth open and hands and cars constantly going and coming, the outside air varying from 14° to 35° Fahr. below zero in winter, to 90° Fahr. in the shade in summer), the temperature never varied from 60° to 62° Fahr.

6. Central heat cannot, therefore, supply the heat that warms the waters of these springs, and we are driven to suppose that chemical, electro-chemical, or the heat of the magnetic tension must heat these waters to their varying temperature. That chemical decompositions and re-compositions are capable of producing any and all degrees of heat every educated person knows—every combustion from a candle to a conflagration is an illustration at once of the variability and intensity of chemical action. It is probable that careful observations on thermal springs, generally, would show variations of temperature in their waters, only to be accounted for by a variable source of heat, for which no cause seems so thoroughly adequate as the heat of chemical reactions.

7. But have we facts indicating such reactions in the crust of the cold and quiet earth?

Look at the changes of sedimentary into metamorphic rocks! Look at the crystalline, double, triple and multiple silicates called crystalline and primitive rocks! Chemical combinations cover the face of the globe. Who knows what stimulents to chemical reactions lie in great pressures, presence of water holding mineral solutions, accumulations of heat and vast thermo-electric earth currents, etc?

8. Is it not probable that hot springs and volcanoes derive their heat from great chemical reactions?

9. May not these reactions be converting sedimentary into metamorphic and crystalline rocks, as actively now as in past time?

10. If sedimentary rocks are the debris of primitive, why cannot and may not there be a chemical reorganization of these debris into crystalline rocks?

11. Is the conversion of sedimentary into metermorphic rocks anything more wonderful than the formation of artificial stone from its dusty elements? Or the change of one kind of metermorphic rock into another or into crystalline rocks more strange than the petrifaction of wood?

Let observers accumulate and publish facts about hot springs and metermorphisms found in mining explorations, and we shall obtain a key to nature's present mineralogical operations which will be valuable to science and to our mining interest. W. S. Rosecrans.

San Francisco, Cal., January 25th, 1879.

The Tuolumne Cave.—This cave has been explored for half a mile; and Gardner, the discoverer, thinks he has determined the extent of it to be over four miles. On the 1st of December, 1878, Garduer says he was engaged in working his placer claim, which is distant 300 feet from the entrance of the cave, when a squirrel perched itself upon a tree near by, and commenced to chatter and spit acorn chucks at him. He repaired to his cabin, armed himself with a double-barreled shot-gun, and fired seven rounds at his squirrelship—the seventh just as his little tormentor was disappearing in the dark recesses of this crevice in the ledge above his claim. Descending by ladder 10 feet, you reach the floor of an inclined archway, dipping at an angle of 35 degrees from 20 to 30 feet in hight, by 30 feet in width. Descending the incline, which is 100 feet in length, you reach the floor of the grand archway, from 40 to 60 feet in hight, varying in width from 20 to 30 feet, from which radiate scores of similar archways leading to spacious chambers. Lofty ceilings draped with brilliant stalactites glitter and sparkle in the light of a lamp like gem. The floors and wall of this subterraneous hall are entirely coated with stalagmites. The location is between the South and Main Stanislaus rivers, near their junction, and one mile northeast of the ancient and classical town of Pine Log.

Soluble Gold, Silver and Lead Combinations.

[Written for the Press by C. H. Aaron.]

Touching the lixiviation process, or processes, for there are several of them, it seems that one obstacle to their general adoption is the prevalence of gold, more or less, in our ores. It is true that Mr. Brookes, of Lower California, and other gentlemen, have stated that in treating the Mexican ores by the Patera or Kiss process more gold is got than formerly by amalgamation, but this process is not supposed to extract gold; and notwithstanding the rather unexpected fact, of which of course there is no question, it does not appear that it can be relied on when any considerable quantity of that metal is present.

I have as yet seen no explanation of the extraction of gold by this process.

In What Combination

Does it exist, and how is that combination produced? It cannot be the terchloride which is formed in Plattner's process, for that compound could not exist under the conditions I think; and if it could, it would all pass off in the wash water, or be reduced by the proto-salts of metals dissolved therein, which would make it insoluble in the leaching liquid. Neither can it be dissolved by persalts in the wash water, else it would again be lost.

There is, however, a certain compound of gold, chlorine and sodium, which it is possible to form in the furnace, at a low red heat, which is stable at that heat, and which, though insoluble in water, is rendered soluble by the aid of hyposulphites, but cannot be amalgamated. I cannot just now recollect my authority for these facts, but I remember that an attempt was made somewhere to adapt the principle to the working of gold ores, but I believe without much success, doubtless owing to the difficulty of getting all the gold into proper condition, though a furnace of special construction was used.

It has occurred to me that as the ores which Mr. Brookes is working contain a great quantity of base metals, including iron, which form in the furnace chlorides which are more or less volatile and unstable, it may be that, although the above mentioned compound of gold would not be produced at the high temperature used in finishing a charge of silver ore, yet the reaction may take place after the glowing charge is removed from the surface, and, as is usual, is allowed to lie in a pile for some time, during which the gradually cooling mass is permeated by vapors of salt, chlorine, volatile base metal chlorides, and possibly a little sulphuric acid.

If this is the true explanation, it may be worth the while of those who are engaged in treating ore by the Patera process, in those cases in which a little gold is present, to pay some attention to the matter, and so manage as to cause as much as possible of the gold to enter into this peculiar combination.

Soluble Silver Combinations.

Mr. Hoffman, in his interesting article on lixiviation by the Patera process, in your issue of Dec. 21st, says that the bath dissolves only that portion of the silver which is in the state of chloride. I must venture to say I think this a mistake.

I have heretofore published, in your columns, an account of some investigations of this point, which convinced me that the ordinary "chlorination test" made with sodium hyposulphite cannot be relied upon to determine the quantity of silver existing as chloride in the roasted ore, because a portion, often considerable, of silver is dissolved which is not chloride, and which, in my experiments, seemed to be a double or multiple sulphate of silver, lead, etc.

Moreover, I find that the hyposulphites, especially in hot solution, can extract a great quantity, as much as 80% of silver from unroasted ores in which it certainly does not exist as chloride.

The point may not be quite immaterial, for, though as Mr. Hoffman says, all the silver which can be extracted by the chlorination test can also be got in the larger operation; yet it is probable that the more perfectly the silver is chloridized the purer will be the resulting bullion, so that a test which is misleading in this respect is so far defective. Hot brine has the same inconvenience of dissolving compounds, other than chloride of silver, which may exist in roasted ores. Perhaps ammonia might answer better.

I cannot help thinking that the

"Lead Chloride"

Which Mr. Hoffman finds so difficult to extract with hot water may be the double sulphate (or whatever it is) which I found, and which is quite insoluble in hot water.

The compound mentioned is inconvenient in treating roasted ore in pans, as, though gradually reduced, it takes longer time, and the silver is contaminated by lead. Its formation may probably be prevented, in part, by the presence of plenty of available sulphur in the roasting ore.

Wire Netting for Protecting Crops.—It is stated by an English exchange that one Bristol firm, that of John Lysaght, sends no less than 1,000,000 yards of wire netting to Australia, where there is a growing demand for it, to protect the crops from the kangaroo and wallaby.

MECHANICAL PROGRESS.

Solidity in Iron Casting.

Great difficulty is experienced in the ordinary way of casting to get a uniformity in the mass and any near approach to perfect solidity. For some years past this difficulty has been obviated to a more or less extent by mechanical pressure. The possibility of doing this was very fully shown at the recent Paris exposition, by Mr. Whitworth, of Manchester, England, whose exhibit comprised an excellent collection of compact pressed castings, which, when compared with the unpressed ingots shown alongside, gave striking tendency of the utility and effect of mechanical compression in iron casting.

Since the introduction of mechanical pressure in casting, however, it has been discovered that a much better result in the same direction may be more readily obtained by chemical action. This chemical action consists in the deoxidizing action of manganese, silicon, etc., in the mass of the iron while in its molten state. This new process has quite recently been brought to an astonishing degree of perfection. This was fully shown, at the Paris exposition, by the French Terreuoire Company, and by other exhibits, both French and English. These exhibits proved most conclusively that compact castings, containing but small amounts of carbon, can be produced on a scale and to a degree of perfection hitherto unthought of, simply by a skillful use of deoxidants. Not only manganese and silicon can be successfully used, but tungsten and chromium can be employed to the same end.

Silicon has been found to be by far the most effective of these reagents; but it is accompanied with the disadvantage, that, when used in excess, it is more harmful to the quality of steel than that of either of the other substances used for producing the desired hardening results. For this reason manganese is preferred, and used in the form of ferro-manganese, or ferro-manganous silicide. Hitherto there has been much difficulty in obtaining such alloys; but at the present time these alloys can be produced in any desirable proportion up to 87% of manganese, a thing which, two years ago, was considered an utter impossibility. In addition to the value of this process of oxidation as a means for obtaining solid, compound castings, these same alloys are also employed for the purpose of deoxidizing mild steel, which can thus be brought down to any desirable degree of poverty in carbon, say, to five one-hundredths of a per cent. As already intimated, the technical progress which has placed this process within the range of ready practicability, is the discovery by which the compounds needed may be produced at a sufficiently cheap rate.

A New Test for Steel.

Although the mechanical and practical tests employed to ascertain the quality of steel undoubtedly offer the basis for a good estimate of the material, and valid conclusions may in many cases be drawn as to homogeneity from the appearance of the fracture, serious mistakes may be made in the latter course, because even close steely fracture cannot always be relied upon; nor is the fact that in manufacture the steel has passed through a liquid condition, a guarantee for its homogeneity. The question is, whether the particles of steel which in a state of rest are uniformly grouped, are so also when the material is subjected to stress. The molecular changes to which fibrous iron is subject under long-continued vibrations or concussions, are well known, and it is established that similar changes of structure, caused by molecular movement, occur with steel also, though not so frequently. The result of long-continued vibration of iron and steel, is a gradual decrease of cohesion. A means for ascertaining the degree of such a molecular change and its consequences, would naturally possess great practical importance.

Prof. Anton von Kerpely has recently read before the Hungarian Academy of Sciences, an important and interesting paper, in which he claims to have elaborated a simple means for attaining the desired end, a claim which he substantiates by the publication of the reproductions of a series of fractures of various grades of steel, obtained by widely differing processes of manufacture and under widely differing circumstances. His test consists of fracturing the sample when hot, and, in order to secure a uniform temperature below red, he has chosen the dark blue color as an indicator. The following is his method in carrying out this plan of fracturing when hot. The sample to be examined, is placed in a bath of lead, which is kept at low temperature in a graphite crucible. After 15 to 20 minutes, according to the thickness of the rod, it assumes the temperature of the bath. If a notch has not been made at the place where the fracture is to be effected, it can be easily done when the rod is hot. With a bath of low temperature the rod cools down too much by being placed on the anvil; in such a case it must be returned to the bath.

The best way to determine whether the sample rod has reached the proper color temperature, is to polish a portion with a file and notice the color of the brightened surface. If no color appears, or the blue disappears rapidly, the rod is too hot; but if any other color but blue remains constant for some time, the rod is too cold. As soon as the proper temperature has been struck the fracture must be made. Prof. Kerpely has made a long series of tests with steels from various processes of manufacture. His general conclusions from these are the following: Good crucible steel shows a peculiar behavior. Molecular change, though plainly discernible by the fine scaly structure, is trifling only when compared to results obtained with other grades. The fracture is almost smooth, and homogeneity seems to have been impaired but little, and it is only with the softest kinds of cast steel that the structure becomes somewhat more scaly in character. Bessemer steel of middling hardness showed quite a high degree of disturbance of the molecular structure, having a coarsely and deeply furrowed fracture, bearing some resemblance to wrought iron. Although it does not follow that all Bessemer steel will exhibit such characteristics, Prof. Kerpely believes that the fracture of the steel may be relied upon, in most cases, as an indicator in tracing the origin of a steel, and often in permitting conclusions as to the treatment it has undergone. The subject is one which certainly deserves experimental inquiry at the hands of American metallurgists and steel manufacturers.—*Iron Age.*

TRANSMITTING POWER BY ELECTRICITY.—Profs. Elihu Thomson and Edwin J. Houston have an important article in the journal of the Franklin Institute for January, concerning the practicability of the transmission of power to long distances by means of electricity. It has been stated by an eminent electrician that the thickness of the cable required to convey the current that could be produced by the power of Niagara would require more copper than exists in the enormous deposits in the Lake Superior region. Another statement estimates the cost of the cable at about $60 per lineal foot. Profs. Thomson and Houston on the contrary assert that it is possible, should it be deemed desirable, to convey the total power of Niagara a distance of 500 miles or more by copper cable not exceeding one-half of an inch in thickness. Stripped of its theoretical considerations, they say the important fact still remains, that with a cable of very limited size, an enormous quantity of power may be transferred to considerable distances. The burning of coal in the mines, and the conveyance of the power generated by the flow of rivers, may therefore be regarded as practicable, always, however, remembering that a loss of about 50% will be almost unavoidable.

TRANSMISSION OF HEAT BY STEEL PLATES.—Mr. John Collins, of the Bolton Iron and Steel Company, Pennsylvania, has been making some experiments on the relative heat-conducting power of iron and steel boiler plates. The apparatus used by him consisted of exactly similar plates of steel or iron 11¾ inches square, 23-100 of an inch thick, supported on glass legs, heated by a "Bunsen" burner consuming equal quantities of gas, maintained at constant pressure of two inches, and a basin three inches in diameter placed in center of plate, containing mercury in which a delicate thermometer was immersed. The temperature of the mercury was then raised from 20° C., to 160° C., and relative times noted. The average gain in time of steel over iron plates of equal thickness is 13%. When the relative thickness of the plates as used in boiler building is taken, this gives an average gain of about 20%. In steam boiler trials, where boilers are similar in all respects, say thickness and material, the actual gain in working 20 days of 12 hours each shows actual evaporative power of 20% in favor of steel. In another series of a similar nature by Stuckenholtz, the results gave 19.6% and 20.8% in favor of steel.

SILICIDE OF IRON.—Mr. Lawrence Smith called the attention of the Academie des Sciences, at the meeting of December 9th, to a remarkable specimen of silicide of iron. It was a piece of pig metal of about three kilogrammes weight, and with a brilliant surface which resisted almost all ordinary chemical agents. The color of the mass was almost the same as that of platinum, and its specific weight was almost 6.50. The result of the investigation to which Mr. Lawrence Smith submitted it is that this metallic mass is a silicuretted iron, remarkably rich in silicon, and that it is evidently the product of a blast furnace. The accidental discovery of this mass proves that there can be produced on a large scale, iron containing a much larger proportion of silicon than has ever been produced in the laboratory, and more than double that contained in the silico-ferro-manganese of the Terrenoire Company, which figured at the exposition, and which contained 10%.

IRON BUGGIES.—The introduction of iron buggies is now proposed. An inventor has constructed a vehicle which consists exclusively of iron and steel. For instance, in place of hickory spokes and oak felloes, he employs wrought-iron tubes and T iron; these tubes fit into the axle box at one end, and are rivcted to the T iron at the other. The first noticeable effect of the employment of iron for all parts, it is said, has been to add to the weight of the vehicle, this having accrued in spite of the thinness of the parts. The cost also has been enhanced, but for this the augmented strength and durability are regarded as a full equivalent. In appearance it is neat and light.

SCIENTIFIC PROGRESS.

Ultra-Gaseous Matter.

Mr. Lockyer's alleged discovery of the dissociation of the elements is not the only novel scientific announcement which has been made to the world during the past few months. Prof. William Crookes, of London, well known to the chemical world, has recently affirmed the probable existence of "a fourth state of matter—a new world—where the corpuscular theory of light holds good; but where light does not always move in a straight line."

It is well understood, and has been amply demonstrated, that the *three* states of matter—the solid, the liquid and the gaseous—though, widely different in their properties, are nevertheless only so many stages of physical continuity. The one passes into the other by insensible gradations, and with the third state it has heretofore been supposed that the possibilities of material change or condition were exhausted. But Mr. Crookes, in his crucial experiments, seems to have advanced another step, and has apparently demonstrated the existence of gases, so attenuated, and exhibiting properties so entirely novel, as to be fairly entitled to be considered ultra-gaseous, or matter in a *fourth* condition.

The means by which this remarkable result has been apparently demonstrated were fully described by Mr. Cronkes at the late December meeting of the British Royal Society. In his early experiments with electric discharges in vacuum tubes, the attention of Mr. Crookes was especially drawn to the dark space which appears around the negative pole of an ordinary vacuum tube when the spark of an inductive coil is passed through it. He has employed different gases and devised various arrangements for giving greater certainty to particular observations.

In order to more fully understand what Mr. Crookes has done, the reader should bear in mind that the physical properties of gases are due to their molecular condition—to the swing and impact of their molecules, and their average length of movement between collisions with one another. It is obvious that if the tenuity of gases is increased by exposing them in as perfect a vacuum as our best instruments can produce, the molecules may be so far separated from one another that their collisions must become much less frequent than under ordinary conditions, and might exhibit properties of an entirely novel character. That such is the fact, has been fully demonstrated by Mr. Crookes. In prosecuting his experiments, Mr. Crookes has arranged vessels capable of high exhaustion, and through these he passes induction discharges, sealing in terminals at either end. In this way he has studied the identity of the illumiuated lines of molecular pressure with the invisible molecular strain he has been for so many years observing. By introducing a cup-shaped fixed disc, which is made the negative pole, he has been able to show the focus of the lines of force. At very high exhaustion, the whole bulb becomes illuminated with greenish yellow, or, according to the glass, other colored phosphorescent light. This light will not turn a corner, but radiates from the negative pole in straight lines, casting sharply defined "shadows" of anything placed in its path. On the other hand, the ordinary luminous phenomena of vacuum tubes will pass along any amount of curves and angles. From a study of these "shadows" Mr. Crookes advances the theory that the induction spark actually illuminates the lines of molecular pressure, caused by the electrical excitement of the negative pole. He considers that the greenish yellow light is caused by the direct impact of the molecules on the surface of the glass. The "shadows" are not optical, but are molecular "shadows", only they are revealed by an ordinary illuminating effect.

As already intimated, his investigations began by a study of the dark space which surrounds the negative pole when an induction spark is passed through a highly attenuated gas. The width of this space was found to vary with the degree of exhaustion of the tube, with the kind of gas employed, with the temperature of the negative pole and with the intensity of the spark. The nature of the dark space Prof. Crookes interprets as follows:

"The thickness of the dark space is the measure of the mean length of the path between successive collisions of the molecules. The extra velocity, with which the molecules rebound from the excited pole, keeps back the more slowly-moving molecules which are advancing toward the pole. The fight occurs at the boundary of the dark space, where the luminous margin bears witness to the energy of the collisions of the molecules. When the exhaustion is sufficiently high for the mean length of the path between successive collisions to be greater than the distance between the electrode and the glass, the swiftly-rebounding molecules spend their force, in part or in whole, on the sides of the vessel, and the production of light is the consequence of this sudden arrest of velocity. When streams of molecular discharge are focused upon a strip of platinum wire or foil, the metal becomes not only luminous but highly heated by the severity of the bombardment; so, too, the molecular impact upon the side of the inclosing glass may be sufficient to make the spot too hot to be borne by the finger." Experiments had been made where the heat rose to the melting point of platinum.

By an ingenious device, the Professor had been able to bring a magnet to bear upon the stream of projected molecules, so that they were made plainly visible to the eye. Under the action of the magnet, the stream of molecules was likened, by the Professor, to a stream of cannon balls under the influence of gravitation. To use the Professor's own words:

"Comparing the free molecules to cannon balls, the magnetic pull to the earth's gravitation, and the electrical excitation of the negative pole to the explosion of the powder in the gun, the trajectory will be flat when no gravitation acts, and curved when under the influence of gravitation. It is, also, much curved when the balls pass through a dense resisting medium; it is less curved when the resisting medium gets rarer; and, as already shown, intensifying the induction spark, equivalent to increasing the charge of powder, gives greater initial velocity, and, therefore, flattens the trajectory. The parallelism is still closer when we compare the evolution of light, seen when the shot strikes the target with the phosphorescence on the glass screen from molecular impacts."

Applied to a stream of molecules the magnet twists the trajectory of the molecules round in a direction at an angle to their free path, and to a greater extent as they are nearer the magnet, the direction of the twist being that of the electric current passing round the electro-magnet. The two poles of the magnet twist the stream in opposite directions. The impact of the flying molecules raises the temperature of any body interposed to arrest their flight, just as the impact of a stream of cannon balls heats a resisting body arresting their flight.

The conclusions as to the existence of an "ultra-gaseous" state of matter arise from theoretical speculations as to the state in which it exists in these highly exhausted vessels. The modern idea of the gaseous state, as already intimated, is based upon the supposition that a given space contains millions of millions of molecules in rapid motion in all directions, each having millions of encounters with others in a second. In such a case, the length of the mean free path of the molecules is excessively small, as compared with the dimensions of the vessel containing it, and the properties which constitute the ordinary gaseous state of matter, and which depend upon constant collisions, are observed. By the great rarefaction which Mr. Crookes has, by years of experience, been now able to obtain, the free path of the molecules may be made *so long* that the hits in a second may be neglected in comparison with the misses, and the average molecule is allowed to obey its own motions or laws without interference; and if the mean free path is comparable to the dimensions of the vessel, the properties which constitute gaseity are reduced to a minimum, and the latter becomes exalted to an "ultra-gaseous" state. Then new and decided properties come into play.

Wood Pulp for Paper.

The scarcity of paper material has of late years led to quite a large employment of wood pulp as a mixture with other fibers in the manufacture of paper. Experience, however, is beginning to show that this addition to the usual paper stock is very prejudicial to the lasting quality of the material. Prof. Renleaux recently called attention to the subject in a lecture delivered at Leipsic, pointing out that, as the paper used in the German public offices is mainly composed of wood, the destruction from natural causes, of any important official records, may be expected. He limits their duration to about 15 years.

This reference is to writing paper, in which but a small quantity of wood is used. How much greater must be the loss and inconvenience in the case of printed books, into which a very large proportion of wood enters. According to Prof. Reuleaux's authority, all our libraries, if made up of paper so adulterated, will have to be renewed every 15 or 20 years, instead of lasting for hundreds of years, as is the case with paper made from the usual fibers.

MEAN DISTANCE OF WATER MOLECULES.—Herman Herwig concludes that no two molecular layers in water can be more than 1-86 of a millionth of a millimeter apart, and that the same is true with regard to the mean distances of adjacent molecular centers. Sir William Thomson had previously estimated the least value of the same distances at 0.05 millionths of a millimeter. These two estimates, one being less than four-fold the other, furnish satisfactory approximations to the true value.—*Ann. der Phys. u. Chem.*

ENORMOUS SUBMARINE PLANT.—Explorers have recently reported the discovery of an enormous submarine plant in the North Pacific ocean. It is known to botanists as the *Macrocistis pyritera*, is said to dwarf all vegetable products yet known by its prodigious proportions. It grows sometimes to such a size as to cover vast areas of sea-bed, one specimen having been discovered that occupied by measurement three square miles, while the stem was eight feet thick.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 16.		Week Ending Jan. 23.		Week Ending Jan. 30.		Week Ending Feb. 6.	
Alpha	12⅞	11⅜	15	12⅛	15⅜	14	18⅛	15
Alta	8	6⅞	8¼	7¼	8⅜	7⅜	8¼	7⅜
Andes	....	....	60c	45c	50c	45c	50c	....
Alps	....	....	....	....	....	....	....	....
Argenta	1.35	50c	60c	60c	70c	60c	65c	60c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	2	1½	1¼	1½	1½	1.20	1½	1¼
Belcher	4.90	4¼	5½	4.40	6	4⅞	6⅛	5⅛
Belmont	60c	50c	60c	50c	70c	55c	80c	70c
Best & Belcher	24½	19¼	22⅞	21¼	22	21¼	24½	21¼
Bullion	8⅛	6⅝	9	7⅛	8⅛	7⅛	8⅛	7⅜
Bechtel	60c	50c	1	75c	75c	....	75c	....
Belle Isle	20c	....	20c	....	20c	15c	....	....
Bodie	9¼	8⅛	9	7⅜	8	7½	8	7⅜
Benton	4⅞	3.20	4.90	4½	6⅜	4⅞	5⅞	5
Bulwer	15	14	15	14	14⅜	14½	15	14¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	60c	50c	75c	70c	75c	....	75c	60c
Belvidere	60c	....	70c	50c	50c	....	55c	50c
Booker	40c	....	30c	25c	40c	30c	40c	20c
Caledonia	3.20	2⅞	3.20	3	3	2.80	2.95	2½
California	11⅛	9⅞	9⅝	9¼	9⅝	9⅞	9⅝	7⅝
Challenge	2.95	2.40	3.05	2¼	3.10	2⅝	4.30	2.95
Chollar-Potosi	52	44½	50⅛	47	48½	46	49	46¼
Comanche	....	....	....	....	....	....	....	....
Confidence	15	12½	17	14½	17¼	15⅜	20	15⅛
Con Imperial	95c	75c	1.15	95c	1.10	1.05	1.20	1.05
Con Virginia	8⅜	7⅛	8⅜	7⅛	8⅛	7	8⅜	7⅝
Crown Point	5⅞	3.95	6	5	5⅝	5¼	6¼	5⅛
Con Washos	2.10	....	....	....	....	....	....	....
Champion	40c	10c	40c	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	15c	5c	10c	5c	10c	....
Daney	....	....	....	....	....	....	....	....
Day	25c	....	30c	20c	25c	20c	30c	20c
Eureka Con	31⅞	26⅜	29	26	27⅛	26⅛	29	27
Exchequer	5⅝	4⅞	6⅝	5⅜	6⅝	5⅛	6⅛	5⅞
Endowment	35c	30c	30c	25c	25c	15c	15c	10c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	5¼	4	6⅜	3.90	4½	4.05	4½	4⅝
Gila	....	....	20c	15c	5c	....	....	....
Golden Chariot	....	....	....	....	25c	....	....	....
Golden Terra	5	....	....	....	6	....	5½	5⅜
Goodshaw	35c	30c	35c	30c	30c	25c	35c	30c
Gould & Curry	16⅞	10⅞	14⅞	13¼	11⅛	12⅜	14½	12⅜
Hale & Norcross	20	14½	18⅞	16⅛	18⅞	16¼	19	15⅜
Hillside	2.10	....	....	....	2	1.95	2½	2
Highbridge	2.05	1⅜	1.80	1.55	1.65	1½	1.85	1⅜
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	20c	....	20c	15c	15c	10c
Independence	1.30	1.05	1⅞	1.40	1.80	1⅛	1.65	1⅛
Julia	3.90	3.40	4⅛	3.45	3.90	3⅛	4.05	3¾
Justice	4⅜	3.90	4⅛	4	4⅛	4	4	3.80
Jackson	7½	....	7½	7	7½	7	7½	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5⅜	4⅜	8	5½	6⅝	5½	7⅜	5⅞
Kossuth	20c	....	20c	15c	40c	20c	25c	20c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	75c	55c	75c	60c	75c	60c	1.30	70c
Lady Wash	1.30	1.20	1½	1	2½	1½	2	1½
Leopard	....	....	70c	30c	50c	25c	85c	15c
Leviathan	55c	50c	1	55c	70c	45c	75c	60c
Leeds	1.10	1	1.10	1	1	....	60c	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	60c	50c	50c	....
Modoc	50c	....	60c	50c	60c	50c	....	....
Manhattan	4½	3.35	3⅞	3½	3.60	3½	3.60	3½
Martin White	4	....	5⅛	5	5	4⅞	5¼	5
McClinton	40c	25c	50c	25c	60c	35c	60c	45c
Meadow Valley	20c	....	....	....	....	....	....	....
Mexican	34	29⅞	34⅜	32½	38⅞	34½	37½	36
Mides	....	....	1⅛	....	....	....	....	....
Morning Star	3	2⅞	3⅛	3	3½	....	3	....
North Con Virginia	7⅞	5⅞	7½	5⅛	7½	6	9¼	7
New York	75c	65c	75c	70c	1	65c	1.10	70c
Northern Belle	8⅛	7⅞	7	6	7	6⅞	8	5⅞
New Coso	20c	....	....	....	....	....	....	....
Navajo	45c	35c	35c	25c	35c	25c	35c	20c
Occidental	1	80c	1	50c	1	60c	1	....
Ophir	36⅛	31	35½	33⅛	35⅛	33⅛	34½	33⅛
Oriental	70c	50c	50c	....	50c	....	50c	35c
Overman	11⅞	9⅞	12⅛	10⅞	11	10⅛	10⅞	10¼
Panther	....	....	....	....	....	....	10c	5c
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	50c	40c	45c	25c	50c	35c	40c	30c
Prospect	....	....	....	....	....	....	5c	....
Raymond & Ely	8⅛	7	7	5⅜	8	6⅞	6	6⅛
Richer	....	....	75c	....	50c	....	75c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	1¼	90c
Savage	16	13⅛	16	14	14⅜	13⅛	15⅝	13¼
Seg Belcher	21	20	23	20	22	....	....	....
Sierra Nevada	56	42	49¼	44	49⅛	46⅞	48	46
Silver Hill	1⅞	1.55	2.40	1.70	2.30	2	2½	1.90
Silver King	....	....	....	....	7	....	10	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	50c	20c	1½	50	1½	75c	1¼	1.05
Summit	2¼	1.60	2⅞	1½	2	1½	2	1⅞
Scorpion	1.60	55c	1⅜	1¼	1.45	1	1.80	1⅛
Solid Silver	1.80	50c	1	70c	65c	50c	70c	60c
South Bodie	....	....	25c	20c	25c	....	25c	....
South Standard	10c	....	....	....	....	....	....	....
Star	50c	....	80c	....	60c	....	65c	50c
St. Louis	70c	30c	55c	40c	70c	55c	55c	50c
Syndicate	....	....	85c	....	....	....	2	....
Tioga Con	1.60	1⅜	1.70	1½	1½	1.30	1½	1¼
Tiptop	1.20	1	1.20	1	1.20	....	1⅞	85c
Trojan	50c	....	50c	40c	45c	40c	45c	35c
Union Con	63	56⅞	60⅛	50	63	59	58⅞	57
Utah	22	13½	18⅞	16¼	19⅛	17⅛	18⅞	17½
Vermont Con	....	....	....	....	....	....	....	....
Ward	75c	65c	95c	75c	35c	75c	85c	70c
Wells-Fargo	20c	....	20c	15c	20c	15c	20c	15c
Woodville	50c	20c	50c	35c	....	....	40c	25c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	20	16½	22⅞	19	21	19½	25½	19½

Sales at S. F. Stock Exchange.

Friday A. M., Jan. 31.
140 Alta....8⅛@6¼
100 Alpha....15
100 Andes....50c
230 Best & Belcher..21⅞@21⅝
1100 Bullion....8
30 Baltimore Con....1¼
445 Belcher....5⅝
640 Benton....5⅛
375 Con Virginia....8⅜@8¼
485 California....9⅛@9⅝
140 Crown Point....5⅝@5⅛
820 Con Imperial..1.10@1.05
500 Caledonia....2⅝@2.60
500 Con Dorado....1½
130 Confidence....15⅛@15⅝
450 Challenge....3@2.95
250 Dardanelles....3⅛
1030 Exchequer....5⅞@6
1450 Flowery....50@60c
475 Gould & Curry....13⅛
200 Geo Douglas....50c
220 Hale & Nor....16⅛@16⅛
230 Justice....4
220 Julia....3⅝@3.70
125 Kentuck....6@5⅞
540 Kossuth....25c
50 Lady Wash....1.60
1800 Lady Bryan....75@90c
805 Leviathan....60c
430 Mexican....36⅛@36⅞
500 Monumental....15c
250 N Sierra Nev....10c
650 Niagara....2
270 North Con Vir....7
1100 N Bonanza....2.85@2.70
1075 New York....1.10@1.05
70 Overman....10⅛
60 Ophir....34½@34¼
185 Plutus....1⅛
2390 Phil Sheridan....30c
200 Rough & Ready....1¼
40 Sierra Nevada....47¼
120 Savage....13⅞
445 Silver Hill....1.90@1.95
2250 Solid Silver....60c
50 St Louis....55c
1150 Succor....1.10@1.15
35 Scorpion....1¼
1480 Trojan....40@45c
30 Union Con....58⅞@58⅛
30 Utah....18⅜
550 Wells-Fargo....16c
460 Ward....75@70c
145 Yellow Jacket....19⅛@19⅜

AFTERNOON SESSION.
325 Argenta....60@65c
780 Albion....50c
145 Bechtel....75c
210 Bodie....7⅜@7⅞
670 Belmont....80@75c
75 Black Hawk....75c
960 Booker....30@35c
10 Bulwer....14⅛@14¼
120 C Pacific....1.45@1⅛
900 Dudley....1¼
730 DeFrees....10c
55 Eureka Con....27
850 Endowment....15c
205 Golden Terra....5⅞@5⅛
250 Goodshaw....35c
765 Grand Prize....4⅞@4.40
200 Hussey....15c
800 Highbridge....1⅞@1.70
300 Hillside....2@2¼
20 Independence....1½
85 Jackson....7@7⅛
300 Leopard....25@20c
290 M White....5@5⅛
100 McClinton....45c
20 Manhattan....3.60
125 Mono....1¼@1⅛
350 Navajo....35@30c
270 Northern Belle....6
100 Oriental....35c
900 Paradise....2⅛@2.55
50 Panther....10c
50 Raymond & Ely....6⅛
100 Real del Monte....1⅛
50 Star....65c
20 Summit....2
600 S Bulwer....60@55c
60 Tioga Con....1½
300 University....1

Saturday A. M., Feb. 1.
10 Alpha....15
190 Alta....8
150 Andes....50c
100 Albion....55c
500 Argenta....60@65c
100 Best & Belcher..21½@21⅝
1125 Bullion....8@7⅛
545 Belcher....5⅝@5⅞
150 Booker....20c
260 Bodie....7⅛
835 Benton....5⅝@5⅛
100 Bechtel....75c
30 Bulwer....14⅜
390 Con Virginia....8⅛@8⅜
870 California....9⅜@9¼
205 Confidence....15⅞
30 Chollar....46⅛
255 Crown Point....5⅝@5⅛
700 Con Imperial....1.10
860 Challenge....3@3.10
1795 Caledonia....2½@2.65
100 Capital....1.05
600 Dardanelles....3.60@3⅞
100 Dudley....1.15
1000 Day....20c
200 DeFrees....10c
980 Exchequer....5⅝
60 Eureka Con....27⅛@27⅞
1215 Flowery....50@40c
520 Gould & Curry....13⅛@13
240 Grand Prize....4.45
100 Geo Douglas....60c
175 Golden Terra....5⅛
100 Goodshaw....35c
585 H & Norcross....16@16⅛
200 Hussey....15c
100 Hillside....2⅛
1000 Highbridge....1⅞@1.80
205 Justice....3.95@3.80
340 Julia....3.70@3.65
80 Jackson....7⅛@7
435 Kentuck....5⅞@6⅛
20 Kossuth....25c
485 Leviathan....60@65c
670 L Bryan....70@80c
640 Leopard....15@25c
570 Lady Wash....1⅛@1.70
100 Leeds....60c
40 Mexican....36⅛
50 Manhattan....3⅛
150 May Belle....50c
50 Mono....1⅛
150 N Con Virginia....7⅛
315 New York....1.05@1.10
1190 N Bonanza....2.20@2.10
100 N Sierra Nevada....10c
60 Northern Belle....5⅞
220 Navajo....35c
120 Ophir....34⅛@34⅞
110 Overman....10⅞@10⅛
300 Oriental....50c
1100 Phil Sheridan....35@30c
200 Plutus....1⅛
100 Panther....5c
100 Paradise....2.60
75 Rough & Ready....1
20 Raymond & E....6⅛
730 Real del Monte....1⅛
340 Savage....13⅛@13⅝
1600 Succor....1⅞@1.05
220 Sierra Nevada....47⅛@48
685 Silver Hill....2@1.90
1200 Solid Silver....60c
230 Scorpion....1⅛@1⅛
100 Syndicate....2
750 S Bulwer....60c
2100 Sutro....20c
375 Santiago....1.65
200 Trojan....40c
100 Tiptop....1⅛
10 Union Con....58⅛
30 Utah....17⅞
380 Ward....75@70c
1025 Wells-Fargo....20@15c
490 Yellow Jacket...20⅛@20⅛

Monday A. M., Feb. 3.
60 Alta....8@7⅛
120 Alpha....15
200 Andes....50c
185 Best & Belcher...22⅛@22⅝
200 Baltimore Con....1⅛
350 Belcher....5⅛
1730 Bullion....8@7⅛
580 Benton....5⅝@5⅝
200 Capital....95c
1120 California....9⅝@9⅛
370 Con Virginia....8@8⅛
180 Crown Point....5⅝@5⅛
405 Con Imperial..1.05@1.10
1240 Challenge....3⅛@3.20
260 Caledonia....2.55@2⅛
200 Confidence....16⅞@17
365 Dardanelles....3⅞
930 Exchequer....6@5⅞
1000 Flowery....35@30c
1385 Gould & Curry....13@12⅞
50 Hale & Nor....15⅞
320 Justice....4@3.90
1330 Julia....3⅞@3.80
155 Kentuck....6⅛
90 Kossuth....20c
780 Lady Bryan....1.30@1⅛
300 Leviathan....65c
50 Lady Wash....1.90
100 Morning Star....3
190 Mexican....36⅛
115 North Con Vir....7@7⅛
1850 N Bonanza....2.05@2
725 New York....90c@1
600 Ophir....34@33⅛
70 Overman....10⅛@10⅛
100 Phil Sheridan....40c
150 Plutus....1⅛
1550 Solid Silver....60@70c
960 Savage....13⅞@13⅛
80 Sierra Nevada....46⅛@47⅛
535 Silver Hill....2⅛@2.60
350 Santiago....1.70
1400 Succor....1⅛@1.05
655 Scorpion....1⅛@1.60
300 Trojan....40c
50 Utah....17⅞
60 Union Con....57@58
730 Wells-Fargo....15c
1025 Ward....75@80c
765 Yellow Jacket....20⅞@21⅛

AFTERNOON SESSION.
580 Argenta....65@60c
300 Albion....40c
180 Bodie....7⅞@8
170 Bechtel....75c
650 Booker....30c
500 Belvidere....55@50c
100 Bulwer....14⅛
100 Con Pacific....1⅛
50 Day....25c
600 Dudley....1.10@1
65 Eureka Con....27⅛
400 Endowment....15c
240 Grand Prize....4.40@4⅛
100 Goodshaw....30c
540 Hussey....15c
2325 Hamburg....1
150 Hillside....2⅛
350 Highbridge....1.80
50 Independence....1.65
100 Jackson....7
150 Leopard....80c
120 Martin White....5⅛
25 Manhattan....3⅛
470 Mono....1⅛@1.45
50 McClinton....50c
950 Northern Belle....6⅞
400 Navajo....35c
100 Oriental....50c
1375 Paradise....2⅛@2.55
100 Real del Monte....3
50 Richer....75c
900 S Bulwer....65@60c
100 Summit....1.90
105 Tioga Con....1.30
100 Tiptop....1⅛

Tuesday A. M., Feb. 4.
100 Alpha....15⅞
100 Alta....7⅞@7⅞
350 Andes....50c
65 Best & Belcher...22⅞@22⅝
695 Belcher....5⅞@5⅝
1500 Bullion....7⅛@8
575 Benton....5⅛@5⅛
200 Baltimore Con....1⅛
1435 California....9@9⅛
180 Caledonia....2⅛
740 Con Virginia....8
1555 Con Imperial..1.10@1.05
20 Chollar....47
250 Crown Point....5⅛@5⅝
295 Confidence....17@17¼
850 Challenge....3⅞@3.80
300 Con Dorado....45c
405 Dardanelles....3.80
550 Exchequer....5⅞@6
720 Flowery....30c
760 Gould & Curry....14@14⅛
100 Geo Douglas....55c
405 H & Norcross....17⅛@17⅛
540 Justice....4@3.95
665 Julia....3⅛@3.70
310 Kentuck....7@7⅛
400 Lady Bryan....1⅛@1.30
910 Lady Wash....2
120 Mexican....36⅛@36
100 Morning Star....3
1650 New York....80@70c
450 North Con Vir....7⅛@7⅞
750 N Bonanza....2.05@2
285 Ophir....33⅛
205 Overman....10⅛@10⅛
100 Occidental....1
50 Phil Sheridan....35c
200 Plutus....1.40
200 Rough & Ready....90c
440 Sierra Nevada....47@47⅛
1180 Savage....15⅛@15
850 Silver Hill....2.40@2.30
2415 Succor....1.10@1.20
505 Scorpion....1.60@1.80
1835 Solid Silver....70c
600 Trojan....40@35c
60 Utah....17⅛@18
55 Union Con....58
200 Wells-Fargo....15c
860 Ward....75c
760 Yellow Jacket....22@22⅞

AFTERNOON SESSION.
1160 Argenta....65@60c
350 Albion....40@35c
390 Bodie....8
350 Booker....40c
110 Belmont....75c
150 Bechtel....75c
100 Belvidere....50c
230 Bulwer....14⅛@14⅞
300 Black Hawk....75@60c
350 C Pacific....1½
800 Caledonia (B H)....90c
745 Dudley....90@80c
350 Day....25@30c
1000 Endowment....15c
405 Eureka Con....28@29
200 Goodshaw....30c
285 Grand Prize....4.40@4⅛
150 Hussey....10c
600 Highbridge....1.80
300 Hillside....2⅛
100 Independence....1.65
290 Jackson....7
565 Leopard....75@80c
600 Mono....1½
180 McClinton....50@60c
10 Martin White....5⅛
100 Minnietta Bell....50c
200 Manhattan....3⅛
150 Northern Belle....6⅛@6⅛
900 Navajo....25@35c
800 Paradise....2⅛
295 Raymond & Ely....6
500 Richer....75c
100 Summit....1.80
510 S Bulwer....70@60c
400 Tioga Con....1⅛@1.30
525 Tiptop....1

Wed'sday A. M., Feb. 5.
250 Andes....50c
405 Alpha....16⅞@17
50 Alta....7⅞
155 B & B....23⅞@24⅛
970 Bullion....8⅛@8⅛
400 Baltimore Con...1⅛@1.40
915 Belcher....6⅛@6
525 Benton....5@5⅛
105 Chollar....49@48⅞
840 Con Virginia....7⅞@7⅛
1425 California....8⅛@7⅛
435 Crown Point....6⅛@6⅛
485 Caledonia....2.80@2.60
1630 Con Imperial..1.15@1.20
450 Confidence....19⅞@19⅛
750 Challenge....4@3.90
100 Dardanelles....3.90
1190 Exchequer....6⅛@6⅛
350 Flowery....35@40c
200 Gould & Curry...14⅛@14⅜
100 Geo Douglas....50c
350 Hale & Nor....16⅞@19
505 Justice....3.95@3.90
810 Julia....4@4.05
705 Kentuck....7⅞@7½
300 Kossuth....20c
700 Leviathan....70@65c
600 Lady Bryan....1@1.10
250 Lady Wash....1.95@2
280 Mexican....37⅛@37½
400 Morning Star....3
550 North Con Vir....8⅛@8
880 New York....90c@1
1715 N Bonanza....2@1.90
765 Overman....10⅞@10⅞
315 Ophir....34⅛@34
400 Phil Sheridan....30c
1775 Succor....1.10@1
500 Savage....15⅛@15⅜
200 S Nevada....47⅛@47
1970 Scorpion....1⅞@1.60
1875 Solid Silver....70c
20 St Louis....50c
625 Silver Hill....2⅛@2.40
1100 Trojan....40@35c
65 Utah....18⅞
180 Union....59⅛
600 Wells-Fargo....15c
875 Ward....85c
100 Woodville....25c
1220 Yellow Jacket...25⅛@24½

AFTERNOON SESSION.
1000 Albion....30c
685 Argenta....60c
30 Belmont....70c
30 Bulwer....14⅞@15
80 Bechtel....75c
445 Bodie....7⅞@8⅜
160 Belvidere....50c
130 C Pacific....1½
600 Caledonia (B H)....90c
675 Dudley....60@75c
300 Day....30c
200 Endowment....10c
410 Grand Prize....4⅛@1.40
450 Goodshaw....30c
125 Golden Terra....5½
370 Hillside....2⅛@2.05
440 Highbridge....1.85@1⅞
200 Hussey....15c
30 Jackson....7
150 Leopard....80@85c
120 Manhattan....3⅛@3⅛
250 Mono....1⅛
300 Northern Belle....8
950 Navajo....25@20c
150 Oriental....50c
150 Paradise....2.30@2⅛
100 Real del Monte....3
125 Raymond & Ely....6
20 Star....60c
200 Summit....1⅞
200 S Bodie....25c
250 Syndicate....2
700 S Bulwer....60@65c
20 Silver King....10
240 Tiptop....85c@1
200 Tioga Con....1.40

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Jan. 30.
245 Alpha....14⅞@15
635 Alta....8⅛@8⅜
100 Andes....45@50c
335 Best & Belcher....21⅞@22
615 Belcher....5⅞@6
950 Bullion....8⅛
2390 Benton....5⅛@6
200 Baltimore Con....1.20
140 California....9⅛@9⅞
485 Con Virginia....8⅛@8⅜
225 Crown Point....5⅝@5⅛
30 Chollar....47
2795 Con Imperial..1.05@1.10
370 Confidence....15⅞
530 Caledonia....2.90
150 Challenge....3
490 Dardenelles....3⅛
985 Exchequer....6@6⅛
1410 Flowery....45@50c
330 Gould & Curry...13⅛@13⅞
100 Geo Douglas....65c
295 Hale & Nor....17@17⅛
330 Justice....4@4.10
825 Julia....3.65@3.70
140 Kentuck....6@6⅛
1050 Kossuth....20c
75 Lady Wash....2⅛@2⅛
955 Lady Bryan....75@70c
440 Leviathan....60c
390 Mexican....38@38⅛
1220 New York....95c@1
395 North Con Vir....7⅛
500 N Sierra Nevada....10c
2070 N Bonanza....2⅛@2.45
320 Ophir....34⅞@35
175 Overman....10⅞@10⅞
4200 Phil Sheridan....30@40c
920 Sierra Nevada....48⅛@49
420 Savage....13⅞@14
280 Succor....75@90c
895 Silver Hill....2.05@2.15
25 Scorpion....1
970 Solid Silver....55c
1025 Trojan....40@45c
470 Union Con....60@61
240 Utah....16⅞@19
370 Ward....75@80c
380 Yellow Jacket....20@20⅛

AFTERNOON SESSION.
650 Argenta....60c
310 Bulwer....14⅞
355 Bodie....7⅛@7⅞
70 Bechtel....75c
950 Belmont....75@80c
540 Belle Isle....20c
950 Booker....30c
130 Belvidere....50@55c
125 C Pacific....1.35@1.40
225 Dudley....1.35@1.40
200 DeFrees....10c
175 Eureka Con....26⅞@27
2150 Endowment....15c
200 Gila....5c
200 Goodshaw....35@30c
470 Grand Prize....4.45@4⅛
525 Hussey....15c
700 Highbridge....1⅛@1.60
115 Hillside....2
790 Independence....1⅛@1.55
110 Jackson....7@7⅛
400 Leopard....25@30c
100 Leeds....60@90c
60 Martin White....5
150 May Belle....50@55c
235 Mono....1⅛
20 Manhattan....3⅛
100 McClinton....40c
925 Navajo....35c
300 Northern Belle....6@6⅛
1500 Paradise....2⅛
245 Real Del Monte....1⅛
470 Raymond & Ely....5⅞@6
305 Summit....1.90@2
50 Star....65c
1850 S Bulwer....50@60c
140 Tioga Con....1½

Thursday A. M., Feb. 6.
10 Alta....7⅞
105 Alpha....18⅛@18½
180 Andes....50c
350 Best & Belcher...23@23¼
960 Bullion....8⅜@8⅛
500 Belcher....6@8⅛
265 Benton....5@5⅛
315 Caledonia....2.85@2.95
7155 Con Imperial....1.20
100 C Dorado....60c
1980 California....7⅝@7⅞
130 Challenge....4.10@4.30
720 Con Virginia....7⅞@7⅞
760 Confidence....19⅛@20
105 Chollar....49
425 Crown Point....5⅞@6
1640 Dardanelles....4@4.05
1270 Exchequer....6⅜@6⅛
1250 Flowery....35c
705 Gould & Curry...13⅝@13⅞
100 Geo Douglas....50c
745 Hale & Nor....18@18⅛
365 Justice....4@3.95
1641 Julia....4@4.05
320 Kentuck....7⅛@7⅞
200 Kossuth....25c
215 Lady Wash....1.95@2
275 L Bryan....1.15@1.20
450 Leviathan....75c
245 Mexican....36⅛@37
100 Morning Star....3
680 New York....90@95c
265 N Con Virginia....8⅞@9⅛
750 N Bonanza....1.70@1.85
130 Ophir....34⅞@34⅛
210 Overman....10⅛@10⅞
635 Phil Sheridan....30@40c
300 Peytona....1
100 Plutus....1.40
145 Sierra Nevada....46@46⅛
840 Savage....14⅞@15⅛
300 Silver Hill....2.45
1600 Succor....1
570 Scorpion....1⅞
700 Solid Silver....70c
840 Santiago....1.80
150 Wells-Fargo....15c
870 Ward....85@90c
225 Woodville....40c
610 Yellow Jacket...24⅞@25⅛

AFTERNOON SESSION.
700 Argenta....60c
100 Albion....30c
600 Belmont....40c
610 Belvidere....50c
250 Bodie....8
50 Bechtel....60c
50 Booker....40c
150 Caledonia (B H)....95c
200 Dudley....1
710 Day....30c
245 Eureka Con....29@30½
820 Grand Prize....4.60@4½
375 Goodshaw....30c
600 Hussey....15@20c
500 Highbridge....1⅛@1.70
200 Hillside....1.90
330 Jackson....7
100 Leeds....75c
200 Leopard....85@90c
200 Martin White....6⅛@5⅞
335 Mono....1⅛
290 Northern Belle....8
3200 Navajo....10@20c
485 Paradise....2⅛
150 Raymond & Ely....5@5⅛
625 Summit....1.90
300 Star....75c
100 S Bodie....25c
570 S Bulwer....55@60c
400 Tiptop....1
225 Tioga Con....1½

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
Maybelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Mono G M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Scorpion S M Co	Nevada	4	10	Dec 3	Jan 18	Feb 10	G R Spinney	310 Pine st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
Succor M & M Co	Nevada	21	50	Dec 19	Jan 21	Feb 10	W H Watson	302 Montgomery st
Tioga Con M Co	California	4	20	Dec 20	Jan 24	Feb 13	W H Lent	327 Pine st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
William Penn M Co	Nevada	4	03	Nov 22	Jan 23	Feb 9	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance M Co	California	2	50	Dec 19	Jan 28	Feb 21	B Lengley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Feb 25	B S Kellogg	308 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Catawba M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Mar 13	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N C Walton	324 Pine st
Loyal Lead G M Co	California	2	60	Dec 18	Jan 20	Feb 11	P M McLaren	318 Pine st
MariposaLand & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	24 Safe Deposit Build
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 24	J Penteeost	511 California st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Mar 24	S F Monroe	419 California st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	Mar 1	April 5	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Almaden Quicksilver M Co	California	John F Mahony	207 Sansome st	Annual	Feb 10
Equitable Tunnel & M Co	Utah	Chas J Collins	227 Montgomery st	Special	Jan 31
Magalia G M Co	Nevada	T A White	113 Leidesdorff st	Special	Feb 10
Mansfield G M Co	California	J M Buffington	309 California st	Annual	Feb 18
Northern King M & M Co	Nevada	G F Glover	318 Pine st	Special	Feb 13
Pinal M & M Co	Arizona	Amos Roberts	214 Sansome st	Special	Feb 19
Silver Lick Con M Co		Alfred K Durbrow	309 Montgomery st	Special	Feb 17
Telfair M Co	Nevada	J Pentecost	331 Montgomery st	Annual	Feb 11
Trojan M Co	Nevada	David Wilder	328 Montgomery st	Annual	Feb 21
Union Flag G & S M Co	Nevada	W H Allen	419 California st	Annual	Feb 13
William Penn M Co		O J Humphrey	328 Montgomery st	Annual	Feb 19
Wyoming & Dakota M Co	Dakota	Theo Widman	404 California st	Annual	Feb 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Dec 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Jan 13

Pacific Board—Latest Sales.

Wed'sday A. M., Feb. 5.
20 Alpha....16⅞
50 Alta....7⅞
70 Belcher....6
250 Best & Belcher....24@24⅛
180 Bullion....8⅜
110 Con Virginia....7⅛
490 Con Imperial..1.20@1.15
20 Chollar....49
110 Crown Point....6@6.05
95 California....7⅞@8⅛
50 Caledonia....2.80
80 Challenge....4
105 Exchequer....6⅜
200 Gould & Curry...14⅛@14⅜
50 Geo Douglas....60c
175 Hale & Nor....18⅞@18⅞
120 Justice....3.95
100 Julia....4@4.05
100 Mexican....37⅛@37⅞
180 Ophir....34@34⅛
15 Overman....10⅞@10⅞
140 Savage....15⅛@15⅛
110 Sierra Nevada....47⅛
20 Silver Hill....2⅛
20 Union Con....59⅛
20 Utah....18⅞
80 Yellow Jacket....25⅛@25

AFTERNOON SESSION.
10 Alpha....17⅛
140 Argenta....70@65c
30 Andes....55c
10 Bullion....8⅛
20 Belcher....5⅞
20 Best & Belcher...23⅛@24
50 Benton....5⅛
10 Confidence....20
215 California....7⅞@8
120 Challenge....4@3.80
25 C Dorado....80c
200 Endowment....15c
110 Exchequer....6⅛@6⅞
45 Hale & Nor....18
40 Justice....3.95
210 Julia....3.90@3.95
175 Lady Wash....2.10@2
20 Mackey....5⅞
100 Mexican....37⅛
20 North Con Vir....8⅛
50 N Bonanza....1.85
640 New York....90@95c
10 Overman....10⅞
30 Ophir....34⅛
150 Phil Sheridan....34@35c
200 Plutus....1.40
60 Savage....16@15
950 Succor....1@1.05
200 S Bulwer....62½@65c
120 Silver Hill....2.40
450 Ward....80@82c
200 Wells-Fargo....15c
60 Yellow Jacket....24@25

California Board—Latest Sales.

Wed'sday A. M., Feb. 5.
15 Alexander....5⅞
30 Alpha....17
60 Alta....7⅞@8
200 Alpine....60c
300 Ætna....10c
200 Atlas....11c
300 Atlanta....5c
150 Andes....55c
60 Best & Belcher..23⅛@23⅝
70 Belcher....6⅛@6⅛
40 Bullion....8⅜
60 California....6⅛@6⅛
40 Con Virginia....8
300 Con Imperial...1.17½@1⅛
30 Crown Point....6⅛
120 Challenge....4
120 Caledonia....2.70
200 C Dorado....65@55c
150 Dayton....20c
80 Exchequer....6⅛@6⅛
40 Gould & Curry...14⅞@14⅛
30 Hale & Norcross....18⅛
30 Justice....4⅛
50 Julia....4@4.15
900 Monumental....7c
30 Mexican....37
100 Mt Hood....10c
100 Mackey....5⅛@5⅛
300 N Sierra Nevada....9c
100 New York....95c
20 Ophir....34
100 Phil Sheridan....35c
30 Savage....15⅞

150	Senator 90c	220	Caledonia .....2.80@2½
40	Sierra Nevada ...47½@47½	20	Eureka Con.....29
30	Union Con.....59½	55	Exchequer.....6½@6½
1200	U Flag 2c	45	Gould & Curry.....14½
100	Woodville.....40c	100	Hussey 15c
40	Yellow Jacket ..25½@25½	35	Julia 3.95
	AFTERNOON SESSION.	35	Justice 3.95
40	Alpha 17½	25	Mexican.....37½
40	Alta .....7½@7½	100	Mt Hood 20c
20	Alexander 5½	300	N Sierra Nevada 9c
100	Andes 52½c	100	New York.....95c
300	Almaden Q.....20@10c	40	Ophir.....34
60	Bullion .....3½@3½	400	Phil Sheridan 33c
60	Best & Belcher...23½@23½	35	Savage 15½
90	Belcher.....6@6	30	Sierra Nevada.....47½
300	Black Hawk.....90c	110	Silver Hill.....2.40
100	Belmont.....75c	150	Trojan .....39@40c
50	Con Virginia.....7½@7½	500	Twin Peaks.....4c
20	Confidence 19½	40	Utah 18½
45	Crown Point.....6	1000	U Flag 2c
200	Con Imperial.....1.15	50	Ward 65c
40	California 8	20	Wales 2
60	Challenge.....4	30	Yellow Jacket.....23½

The Mining Share Market.

The mining stock markot remains in the fitful and spiritless but expoctant condition remarked upon at our last writing. This is especially the caso with Comstock shares, for which no sharp advance in prices is looked for until further ore developments shall bo mado at somo point along the great mother lode. This ovent many operators affect to believe will occur in the early futurs; some time in March or April at the latest, laying a foundation for the usual "spring rise." Without new ore finds of importance, it is generally conceded that higher prices for Comstock shares cannot be looked for; in the absence of these it will, in fact, be difficult to sustain present rates for any great length of timo. With but a single dividend-paying mine along the whols Comstock range, assessments, evon now paid grudgingly, will, hy and by, be declined altogether unless a hetter ore showing shall meantime be made. Let ths various managements bear tbis in mind and hasten to bring to light the honanzas that somo of them profess to have in reserve, and that all may hopo soon to uncover if indications are as favorable as they report. As enough snow is said to have fallen on the mountains to insure a pretty steady run of the mills on Carson river the coming season, thess Comstock companies need not restrain possihls ore developments through fear of insufficient facilities for reduction.

At the south end the Alta-Justice group of mines have of late shown a little more vitality, and it is expected that the Alta crosscuttings will shortly reveal a body of pay ore. The rigorous weathor, common to the winters of Bodie, has tended to curtail operations there, causing a corresponding torpor in tho shares of that district. All will, no doubt, be more lively with the advent of spring.

What are known as the "water stocks," being the shares of mines in close proximity to tho point where the Sutro tunnel intersects the Comstock lode, experienced a sharp advance towards the end of the week, in consequence of the settlement effected between Mr. Sutro and the mining companies; an event brought about through ths final agreement of the latter to pay the royalty as stipulated in the original agreement hetween these parties. While it is not probable that this adit will ever be much used for carrying out ores from the mines, nor yet for other purposes of transportation, it will undoubtedly bo of much seivico for relieving the mines of water, the great obstacle to deep exploration. From this time on it may he expected that these parties will act in harmony, and, abandoning the suits already instituted, dismiss the army of lawyers and cease further litigation.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipmente:

Indian Queen, Jan. 27th, $4,393.42; Tybo Con., Jan. 26th, $3,900.39; Paradise Valley, Jan. 29th, $3,814; Highbridge, Jan. 31st, $15,543; Tybo Con., Jan. 28th, $5,573.15; Hillside, Feb. 3d, $5,500; Christy Con., Fch. 1st, $6,475; Extra, Jan. 31st, $5,795; Northern Belle, Jan. 29th, $2,042.80; Grand Prize, Feb. 3d, $17,000; Navajo, Feb. 3d, $1,800; Tybo Con., Jan. 29th, $8,701.92.

A NEW MACHINE SHOP.—Messrs. Goss & Adams, formerly of Sacramsnto, have bought the machine shop at the old stand Nos. 114 and 116 Beale street, and are now prepared to do all classes of work. Mr. Goss was formerly of the firm of Goss & Lambert, proprietors of a foundry and machine shop in Sacramento. They began husiness there in 1852, and sold out in 1868 to the railroad company. Mr. Lamhert of the present firm, was foreman for the old one. They had as good a reputation as any in the Stats while they were in business, for doing all kinds of work, which reputation they propose to maintain in their new husiness. The works havs a complete outfit of lathes, planers and all nscessary tools for doing all classes of foundry and machine shop work. Ths present facilities are good, but tbey propose to amplify them as occasion demands.

G. W. SWAN & Co.'s Union Box Factory has received, through N. P. Gregory & Co., a 14x24 engine from the Buckeye Engine Co., of Salem, Ohio. It is a 96-horse power engine with automatic eut-off, and of a different style from any that has been previously brought to this coast.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—*Ledger*, Feb. 1: On the Hercules the shaft is down 100 feet, and indications favor the development of a paying mine. It is supposed to be on tho mother lode. The ore looks well, carries a heavy percentage of sulphurets, with occasional specks of free gold visible. Ths Moore shaft is down 250 feet, with a ledge varying from five to seven feet in width. It is calculated to start tho mill early next week, preparatory to which quartz has beeu accumulating on the dump for soveral days. At tho Oneida sinking operations are through with. The running of drifts to strike the ore body is noxt in order. This will take from six weeks to two months to accomplish. In the meantime the mill will be kept operating with 20 stamps, oue-third of its capacity. At the Monterichard mine siuking is through with, and the mill has got steadily to work again. Tbo Kennedy company havs had a couple of men employed cleaning out their ditch—soms 20 miles in length. The work was done, not probably with a view to the early resumption of work at the mine, but to secure the property against jumpsrs. J. Millo has purchased the old State of Maine quartz mill of five stamps; has removed it to a mining claim near Middle Bar on the Mokclumne river, where he is having it put in trim for active operations.

PHŒNIX.—All the ore coming from this mine is good. They have been short of fuel for the mill, but by great exertions have managed to keep it running. All the employees have lately been paid in full aud business is lively.

BUTTE.

MINING OPERATIONS BEGAN.—*Record*, Jan. 31: Work was receutly commenced on the Modoc claim, located about two miles west of Bangor. They have a monitor in position and a pressure of 216 feet, which is secured by seven miles of ditch. The company also purchase a little water from the Forbstown ditch company. The opinion prevails that the bank uow being opened is situated on the rim-rock of ths famous Blue Lead mine. Should such prove to be the caso, the owners of this property have, most likely, a veritable bonanza.

BUTTE CREEK MINES.—*Record*, Feb. 1: John Allen bas struck good diggings at this locality; and having secured a plentiful supply of water from the Shephard ditch company, is washing away the top dirt from what appears to be an old river channel. The McIntrye claim is still paying handsomely. The Nichols and Longley claim is turning out well. We understand that the dirt is paying from three to five dollare a carload, and is easily worked.

CALAVERAS.

GRAVEL MINING.—*Chronicle*, Feb. 1: Tbe recent rains have furnished an abundance of water for mining purposes, and all the claims in this vicinity, for the first time this season, are now being worked to their fullest capacity. At the Duryea mine in Chile gulch, the system of operations has been changed from drifting to hydraulicking. A good deal of preliminary work has been doue iu getting the mine in proper shape—such as running tunnels for the accommodation of flumes, etc., for which wo fesl certain the proprietor will receive epeedy remuneration. At the Mammoth the gravel is looking bstter than ever before. A late partial clean-up yielded beyond all expectation. At the Bonanza things are progressing as usual. The miue is yielding handsomely, is systematically worked and admirahly managed. A large amount of water is used, and as the claim is well equipped and in proper shaps for working, every inch of it counts. Evans & McCann are still at work in their tunnel claim in Tunnel Ridge. They have not yet reached pay gravel, but are expecting to shortly. They are running what is known as the "old Sullivan tunnel," and are near the channel. The Eureka, located near the Calaveras river, is now in full blast. From 500 to 700 inches of water ars used. The Eureka is on this eide of the river, the water for hydraulicking being brought across the stream in iron pipss. We expect to be able to give a rousing report of the Eureka when a clean-up is made. Ground has heen broken for the great tunnel to be run by the Happy Valley and Blue Gravel Hydraulic Mining Co. But two msn are at work upon it at present, however, considerable preliminary work having to hs done hefore the enterprise can be commenced in good earnest. Work has been resumed at the Maison d' Sante hydraulic, one of the hest paying mines in tbie sectiou of the State. The Maison d' Sante paid largely last season, and we are informed that the prospects are favorahle for it doing as well this season. Tuesday, piping was commenced by the Happy Valley and Blue Gravel Co. They are washiug through a three-foot flume and using all the way from 500 to 1,000 inches of water. Work has heen begun in what was formerly known as the "Percival claim." The rains have also set men at work in placer diggings, and the mining interest is flourishing in all directions.

DEL NORTE.

MINING ON ROGUE RIVER.—Crescent City *Courier*, Jau. 22: There is more or less mining going on along the river. It ie a hard matter to ascertain the amount of gold taken out during tho year, but it is evident that the miners make it pay or they would not remain so long as some have. Very fino prospects have been fouud high up on tho benches, beth on Rogue and Illinois rivers. On the Illinois river it would pay a company with capital to bring in a ditch and work the benches, which are one above the nther, and prospect well down to the bed of the river. Six or seven miles of a ditch will bring a sufficient snpply of water. Ths gold is coarse. Experienced miners state if water could be brought on the grounds that men could make about four dollars por day.

MONO

WEEKLY MINING REVIEW.—Bodie *Standard*, Feb. 1: The past week has beon remarkable mostly for one of Bodio's sovere snow storms, which has covered the ground to a depth of a few inches. Our leading mines being under cover, work in exploring has not been retarded in any material degree, hut has been continuously pushed ahead with vigor and persistence. Tho wisdom of crecting substantial buildings over shafts and machinery is now makiug itself mauifest, and the result is a subject for congratulation. During the week the Standard and Bodie mines have been producing their usual quota of ore, that from the former being of higher grade than worked last month, much of it bsing taken from the new strike mads while crosscutting. Tbe Bulwer has bsen shipping ors to the Bodie mill, which it ie expected will start up this week. With three dividend-paying mines we ean open the spring seasou with cheering prospects and the product from tbe ores worked will effectually silencs the Emperor Norton style of bears now so fashionable on Pine strect. The owners of the Lucky Rodge, a location on the western slope of Bodie bluff, have honded their property to Howard Hastings of the Mono County Bank, and there is scarcely a doubt that a sale will bs made before 30 days. The mine in question has produced some fabulously rich rock, one piece taken from near the surface having assayed nearly $40,000 to the ton. The Con. Pacific, South Bulwer, Goodshaw, Mono, Champion, South Bodie, South Standard, Red Cloud, Booker, aud, in fact, every mine having facilities for working to a depth are all looking promising in the extreme, and another month's work must bring to the front many magnificent properties which will bs self-sustaining. Our winter must necessarily be of short duration, as the seasou is so far advanced that the sun's rays will melt the enows which would otherwise lay long npon the ground. We anticipate that next March our winter will be about over, and that the influx of speculators and mining men will then commence. Taking everything into consideration we can see no good reason to donbt the fact that Bodie will within three months be the leading attraction of tho mining world, and that she will base her claims to the first place on pure merit there cau be no doubt iu the mind of any unprejudiced person.

NEED OF WATER.—The question of a sufficient supply of water for the mines and the consumption of the people will become a serious question during the next season. The light fall of snow for this section, and the consequent drying up of wells in the summer months, will be a serious matter before the year is out. At the present tims there ars a few of our mines which supply water sufficiently (if used) for their own uses, but tbe great majority of properties are ohliged to have their water supply conveyed to them by means of barrsls loaded on teams. The present open winter has rendered it possible for teams to keep their customers supplied with water, hut at a great expense to consumers. We have heard several schemes broached, having in view the supplying of this nccessary article to our mines and town, hut, as yet, know of no actual live measures having heen adopted or consummated. There is money iu this scheme for parties having capital, and we have no doubt that some clear-headed speculators will make succcssful what now seems chimerical and uncertain. There's money in it, and consequently it is only necessary to interest the proper parties to make the matter a complete success.

NEVADA.

WATER STILL SCARCE.—*Transcript*, Feb. 2: During the progress of the last heavy storm there was a head of 7,500 inches of water in the South Yuba Canal Co.'s main ditch. At one time last week the amount had diminished to 1,500 inches, on account of the small streams from which the supply is dsrived freezing up during the cold nights that have prevailed for some time. At present there is only a head of 2,700 inches in the ditch. It is earnestly hoped that a warm storm will soon set in and increase the supply, as the hydraulic mining interests are suffering considerably now. There are hut 300 inches of water iu Deer creek now, whereas that channsl ordinarily contains 2,500 at this season of the year. The Manzanita mine is obliged to remain idle a good share of the time on account of the scarcity of water, and the Blue Tent claims aro doing nothing to speak of. The North Bloomfield manages to kesp going on a limited scale.

TRIBUTE ROCK AT GRASS VALLEY.—The *Union* says there is now no difficulty in Grass Valley district in making contracts with companies of working miners to take out quartz on trihute, from mines which give a rcasonable assurance that the rock will pay fair wages. At the present time a great deal of work is being done on this plan, and while men do not in every instance make good wages, numbers have been fortunate enough to make as much as four and five dollars or mors per day. It is only within the past year or two that work has bseu done on this plau thers to any extent, but it seems to be coming into gsnsral operation, and now ths majority of tho mines of the district havo tribute companies at work, and even some of ths operations of prospecting companies are carrried on by this system. So far it has generally been found to work advantagsously to both mine owner and ths miner, as it has lessened the cash outlays of ths first and given a great deal of employment to ths latter, who might not otherwiss havs found steady employment at the current rato of wages.

HUNT'S HILL.—John McAllis has started operations at his mines. He is at present using 500 inches of water, all that is running in the Cascads ditch at present. Ths Florencs company are all ready to wash as soon as water ean be obtained. Work will commencs in ths Sargent & Jacobs claim as soon as their ditch is thawed out, and from present appearances they will not be obligsd to wait long.

PLACER.

ABOUT OPHIR.—*Argus*, Feb. 1: The hauling of quartz from the St. Patrick mine to the Crater mill was resumed on Weduesday. The mill will begin crushing again next week. An excellent quality of rock is being taken out. Quite a number of men are prospecting on Duncan hill, back of the Stone house.

NEVADA HILL.—*Herald*, Feb. 1: This mine yielde good ore, but is not now being worked in consequence of an excess of water, from which it cannot be freed with the present iusufficient machinery. As soon as the weather will permit, work will be prosecuted here in a vigoroue and efficient way. A. O. Bell, the discoverer of this mine, is busy prospecting in the same locality, fully confident that he will strike another bonanza, and we sincerely hope he will succeed. Mr. Bell is one of those kind of men who allows his money to circulate frsely; giving employment to the unemployed and thereby assisting the industrious poor. Such men are an advantage to a community.

SNOW.—They have had two feet of snow on the Forrest Hill Divide, affording good sleighing—the best bad there for 20 years.

TUOLUMNE.

MINING ITEMS.—*Independent*, Feb. 1: At Union hill Thos. Adame etruck a rich streak in his quartz claim last week and in two pans took out $254, with a good prospect for getting more. The five-stamp mill on the Keltz mine started up on Friday for the first time. The mill is large enough to accommodate five more stamps, which in all probability will be added in the spring, The Draper struck a good chute in the upper level going north, last week. Nine-incb vein, showing heavy lead sulpburets. Ben Soulsby has a good vein near Soulsbyville, supposed to be the north extension of the Soulsbyville mine. The Golden Rock mine, above Garrete, is now iu full hlast, water being abundant. About eight or nine men are employed, running two giants. The ditch has heen kept open all winter, in spite of the forces of the Storm King. The prospects are good, the stream being set against the gravel banks, 84 feet high. Wheu they get to the deepest part, the bank will be somo 150 feet high. The great difficulty now is, to find just where the channel really is. This will be better developed when a large amount of the top is stripped off. Tho Managing Agent, C. Dorsey, Esq., intends to test the mine thorougbly, hefore going into the extensivo operations contemplated, if everything proves as anticipated.

SIERRA.

MINING ITEMS.—*Mountain Messenger*, Feb. 1: The Michigan claims, near Gibsonville, owned by Clough & Lowell, are again paying well, or rather, the miners are taking out "hig dirt." A piece weighing four dollars was picked out of the dirt by one of the workmen the other day. Work at the Pliocene shaft has been etopped for the winter at lsast. So much water was encountered that it was found impossible, with tho present machinery, to make any progress. What course tbo company will pursue we are unahle to say.

NEVADA.

Our usual wsekly summary of news from the Comstock mines has failed to reach us, and ws are thereforo compelled to go to press without it.

BELMONT DISTRICT.

HIGHBRIDGE.—*Courier*, Feb. 1: No change in the mine of note. Are extracting the usual amount of ore. Have added five more stamps to the battery, which now crushes as much ore as the balance of the mill can handle. Will ship to-morrow bullion valued at $15,543.51. Total shipment for the mouth, $43,452. After starting up the mill, some two months ago, it was found that altorations in the machinery were necessary, wbich prevented making progress in the crushing of the ores that otherwise would have heen the case. The changes and improvemeuts found necessary, are now about all completed, and hereafter the company will be enabled to increase the production of hullion. Cousidering the many difficulties that have had to be contended with, the production for the mouth of January is very respsctable in amount.

TYBO CON.—Shipped to the 25th ult., on January account, $47,656.12. Ths furnaces have both bsen run down, cut out and re-linsd the past week. The work was done rapidly, No. 1 being closed only 18, and No. 2, 19 hours. There ars no changes of importance to nots in

Continued on page 92.

Cosmic Meteorology.—No. 3.

[Written for the PRESS by SAMUEL PURNELL.]

Although I have not seen it mentioned elsewhere, I would call attention to the suggestive fact that the sun-spot cycle of 11.11 years is just one-third of the alleged meteoric period of 33.33 years, which would seem to point to a connection, more or less close, between the two cycles. How they are or can be connected, I have not had the opportunity of even attempting to ascertain, and it is perhaps idle to speculate.

I would also call attention to the fact that the times of maximum and minimum of sun-spots appear to have a definite relation to the

Prevalence of Plagues

And pestileuces, particularly of cholera and yellow fever, each seeming to rage most malignantly during years of the minimum groups. As it is my intention to treat this brauch of the subject in a more thorough manner hereafter, I will only add that cholera prevailed extensively from 1841 to 1843, 1853 to 1855, 1865 to 1867, in each of which periods was a year of a minimum group; and the yellow fever appeared with great virulence, in the United States, in 1798, 1853, 1867, and 1878, all of which were minimum sun-spot years except 1853, and that was very near the year. That the theory of the prevalence or ahsence of sun-spots, as affecting diseases, can have some reasonahle foundation, will probably be clearer after the cause of the spots is duly cousidered; because, as startling as the thought may be, if it is known that a more or less active condition of the surface of the sun can cause such changes in the physical motions and conditions of our globe, it is reasonahle to assume that life, as manifested in man and animals, can be and is similarly affected.

A Difficulty

That meets the studeut in trying to solve the suu-epot problem consists in the fact that there is yet among astronomers no definite plan of recording sun-spot ohservations. Not until 1826 were they regularly observed, and for many years afterward only the number of new spots or new groups was recorded. Of late years the area of the spots has also been measured. Yet there can he little douht that several elements in the stating of the problem are wanting. Besides, the first appearance, the area, and the duration of a spot, there should evidently be noted in addition, its persistence, intensity, and motion; the condition of the prominences and the photosphere, the position of the planets, and all other accessible solar phenomena. The spots are probahly not originated hy the sun itself, hut by outer and perhaps unknown influenccs, and these are only to be learned, and the sun-spot problem mastered by a study not only of the spots but of all the accompanying celestial changes; and for this purpose the eun's surface is a chart indicative of these changes.

Introductory to the following tahle, principally compiled by Lockyer and Huuter, it will be well to premise that the actual sun-spot

Maximum Years

During this century have heen, in round numbers, 1870, 1860, 1848, 1837, 1829, 1816, 1804; and the minimum years, 1878, 1867, 1856, 1843, 1833, 1823, 1811:

	Minimum group of the 11-years cycle.	Intermediate group of the 11-years cycle.	Maximum group of the 11-years cycle.
Wolf's mean relative sun-spot number	12.6	43.55	76.80
Diurnal inequality of magnetic declination, 1813 to 1871, Prof. Stewart.	6.74	7.72	9.45
Electric displays, auroras observed, Prof. Loomis	23.	42.	55.
Number of cyclones of Indian ocean, 1856 to 1867, Dr. Meldrum	7.33	8.25	13.25
Relative area of cyclones of Indian ocean, 1856 to 1867, Dr. Meldrum	2.10	3.39	9.21
Number of hurricanes of West Indies, 1810 to 1873, Poey	2.53	2.72	4.25
Percentage of losses on registered vessels of Great Britain, 1856 to 1876, Jeula and Hunter	11.25	11.44	12.52
Madras rainfall, total average, 1813 to 1876, Hunter	40.39	49.07	53.50
Average annual rainfall of Bombay, 1817 to 1876, Hunter	68.78	71.89	75.28
Average annual rainfall at Cape of Good Hope, 1842 to 1870, Hunter and Stone	21.05	23.59	27.95
Madras famine (causing drouths), 1812 to 1876, Hunter	5	1	0
Brazil, drouths	13	10	7
Derby, floods	2	4	6
Relative annual amount of atmospheric ozone, 1850 to 1869, Moffat	1.5	1.7	2.1

In close connection with the sun-spots are the

Strange Forms

That are seen upou the edge of the sun, exquisite in color, fantastic beyoud description in outline, and of stupendous magnitude. These are the so-called promineuces, or red flames. They were formerly visible only during solar eclipses, but now may he looked upon duriug any clear day. At one time a dozen may be seen around the edge of the sun, some of them 100,000 miles high, at other times there is scarcely the most feeble indication of this form of solar activity. Like the solar-spots the prominences wax and wane, simultaneously with, aud proportionately in size and intensity to the sun-spots. They are usually considered to be phenomena of eruption, hut their nature is little understood. This being a year of extreme minimum of sun-spots, we should expect the prominences to be much below the average, and accordingly the royal observatory of England announces in its report for the year ending May 2d, 1878, that "all the observations go to show that the solar prominences have been few in number and insignificant in size for many months."

Another interesting phenomena exhibited by the sun is the

Corona,

The beautiful crown of light seen around the moon during the moments of total solar eclipse. It was formerly thought to be due to the atmosphere of the moon, but is now recognised as a true solar appendage. Its cause and constitution are at present a matter of speculation. Mr. Lockyer holds that it shines hy light reflected from the sun by a cloud of meteors surrounding that luminary, and which are probably arranged around it elliptically; the corona itself, being mainly composed of violent uprushes of gas from the sun's interior in spot maximum years. In spot minimum years the corona contains uo gas. In this connection it may be remarked that Mr. Lockyer regards sun-spots as down-rushes of gas, and as showing evidence of a return convection current. When a year of maximum sun-spots occurs, or *vice versa*, and a total solar eclipse also occurs, it is seen that

The Corona is Varied

In color, size and intensity correspondingly with the spots, and the proof is clear that they are intimately connected, and perhaps both are due to the same celestial disturbance. Could the corona be examined at pleasure, its periodicity would be speedily shown, yet at eclipses its varying conditions have been especially remarked. According to Mr. R. A. Proctor, recent eclipses indicate that during years when sun-spots are numerous, the corona presents an appearance entirely different from that of last July, when the sun was almost free from spots. During the eclipse of 1871, a year in the maximum group, the corona extended at least 250,000 miles from the sun, while in July last, it reached a hight only of some 70,000 miles; in the former year it possessed a very complicated structure and was pink, while in the latter it was pearly white. The year 1705 was a year of maximum sun-spots, the corona duriug the eclipse of the following year was very extensive. The year 1717 was a maximum year; the eclipse of 1715 sbowed a maximum corona. Iu 1724, the corona was small; the ycar 1723 was one of minimum disturbance; the same may be said of the corona of 1766, and the spots of the same year, and of a number of eclipses since. The principal comparisons of the corona with the sun-spots are based, on the finely observed solar eclipses of 1871 and 1878. The corona seen last July, led to the inference that the gaseous matter which was present in 1871 was either entirely absent or greatly reduced in quantity. It was very much less brilliant thau usual, and smaller, a few prominences were seen, and several bright streamers. In 1871, there were many spots, many prominences, many magnetic storms and auroras, excess of rainfall, no famines, and a large and brilliant corona. This year there are few spots, prominences are rare, the magnets were scarcely ever so quiet, famines abound, and a small corona. Mr. Lockyer says that at present the

Solar Energy

Has run down: with the reduction of spots and prominences during the last four years, the terrestrial magnetism has been less energetic than for the preceding 40 years, while at both ends of this period, there have been famines in India and China. The present quiet position of the sun is worthy of minute study. The absence of lines from the coronal spectrum shows a great reduction in the temperature of the sun, and such a marked change in it should produce a corresponding change in the earth, as the condition of the earth sympathizes with the condition of the sun.

What is the Sun?

What a correct answer to this question would be, nobody knows. A few particulars, the least important, perhaps, are thought to be known of the constitution of some of its portions and of some of its powers, hut of it integrally and materially, human knowledge is scant, and, possihly, what is thought to be estahlished truth is really hut error. When almost every philosophical astronomer is of a different opinion from his fellows relative to the nature of the sun, some claiming that the sun is hot and some that it is cold, it is easily perceived that exact knowledge concerning it has not yet heen attained. But, to state the most ohvious conclusions, if the parallax has heen correctly determined, the distance of the sun is some 93,000,000 miles, its diameter some 850,000 miles, its volume is some 1,250,000 times that of the earth, and at an equal distance it would exert 315,000 times as much force ou a body as would the earth; its specific gravity is thougbt to he 1.367, or about one-quarter that of the earth; the weight of a body on its surface would be about 27.36 times greater than on the earth; its rotation on its axis is accomplished in about 25.34 terrestrial days; it is moving through space at about five miles per second; its daily rotation is 14° 18'. Mr. Lockyer says the sun is now generally considered to be a

Huge Incandescent Globe,

The very coolest part of which is glowing with a heat which transcends all our earthly fires; its heat is not thought to be due to combustion, as in our fires, hut to the vivid incandescence of each particle, brought about hy the original contraction of the vaporous globe, or by causes even more remote and unknown.

The Earth's

Velocity around the sun is 18.2 miles per second; the volume of the earth is so small that it intercepts less than two-millionth of the sun's radiated energy. Theoretically, the maximum limit of the atmosphere is about 21,000 miles, at which point the centrifugal force is equal to the weight of the air; the minimum hight is about 30 miles, or about the 130th part of the earth's radius, the actual hight of the sensible atmosphere may be 200 miles, the entire weight of the air is about 1-1,100,000 of the weight of the earth. The weight of water is 770 times that of air. Tropical evaporatien is supposed to amount to at least 16 feet of water, of which about six feet fall in the same region, and about ten feet are transported toward the poles; the surface from which the evaporation takes place may be estimated at 70,000,000 geographical miles, and from this it will be seen that the depth of 10 feet of water represeuts a volume equal to 25,000 billions of cubic feet (25x10.15), transported through the atmosphere by the power of the sun's rays.

The above figures will give the uninitiated some idea of the earth and its atmosphere, the volume of the sun and its powers, as affecting the rainfall and sun-spot problem. A brief account of

Various Opinions

Of the sun-spots, their probable cause, and how that condition of the sun and planets of which they are a measure, affects our earth, in the forms already mentioned, will conclude this part of the subject.

While this subject was formerly. and is now beset by the impossibility of getting accurate accounts of the solar spots, the future studeut of cosmic meteorology will possess sound data upon which to erect his dictum and decision. Of late years a minute study of the sun-epots has been made a part of regular observatory work, and in a few years more, most interesting facts may be published. So far the observations and speculations of two centuries have not sufficed to determine the true character of the spots. The most fantastic notions of them have been indulged. The students of the Aristotleian philosophy denied the possihility of their existence, alleging that it is impossible that the eye of the universe should suffer from ophthalmia. It has been variously thought that sun-spots were only apparent not real; that they were in our atmosphere or our glasses; that they were wandering cosmical hodies hetween the earth and the sun; that they were caused hy meteoric streams upon the snn; that they were great yawning chasms in the outer atmosphere of the sun; that they were solid parts of the sun exposed from time to time by the ebb and flow of a liquid, fiery and transparent sea; that they were parts of a cool and habitable globe. The hest modern opinion seems to be that they are really openings in the sun's atmosphere of a cyclonic nature, through which gas pours in and out. According to Father Secchi, they are "solutions of continuity in the stratum of mists or luminous vapors which form the photosphere."

The spots are confined generally to

Two Definite Zones,

Extending about 35° on each side of the solar equator; an intermediate zone to a distance of some 8° on either side of the equator being usually free from spots. Tints of red within the spots have been noticed, and are supposed to he part of the chromosphere which surrounds the whole globe of the sun. Spots have various motions—rotatory and rectilinear; change in figure or wholly disappear, often in a single moment. The motion of a spot across the sun's surface from west to east has heen observed to have a velocity of 600 yards per second. They vary incessantly in form and position, remaiuing most frequently upon the suu during one or two of his rotations. They are not of uniform brightness, but are commonly surrounded by a fringe less dark than the central part. Their size varies; the least spot that can he perceived with the telescope must have an area of at least 50,000 miles; in 1828 a spot appeared which was equal to four times the earth's diameter; in 1839 appeared one of seven times, and in 1859 appeared one of 18 times the diameter of the earth. But whatever sun-spots may he, or whatever their cause, the scientific world is now sure of

One Leading Fact,

Which is that the energies at work upon the sun are not constant. At times the spots are so enormous as to he visible to the naked eye, at other times the sun is apparently spotless. At times glowing vapors rush up from its bowels with great persistence, at other times they are invisible for months; and when there is the greatest number of up-rushes of heated matter from below, there is the greatest number of spots and prominences. According to Mr. Lockyer, the spots may be taken as a rough index of solar energy, just as the rainfall may he taken as a convenient indication of terrestrial climate. They are an index but not the cause or complete measure of solar energy, and their apparent absence indicates a reduction, not a cessation of solar energy—the percentage of which is unknown.

Speculations.

Prof. Loomis believed that a sun-spot is the result of a disturbance on the sun's surface, with some emanation from the sun that is almost instantly felt upon the earth. Father Secchi remarked that the variation of the sun's activity may well be communicated to the earth, either hy means of heat or some other channel as yet unknown; such, for instance, as by electro-dynamic action, thus producing upon our earth meteorological or electric phenomena. Becqueral maintained that the origin of atmospheric electricity is the sun, and that there can he no other complete explanation of the enormous quantity diffused in the atmosphere; and he was also of the opinion tbe the positive electricity of the sun is carried through planetary space by hydrogen gas.

What the substance or force is by which the energy of the sun, with all its quick variations, is almost instantaneously transmitted to the earth, affecting the entire globe so powerfully, is yet a matter of speculation; but it seems reasonable to assume that it must be an etheric force of a nature similar to electricity, but finer and of more poteucy.

[To be Continued.]

The Cone-bearers, or Evergreen Trees of California.—No. 3.

[Written for the PRESS by J. G. LEMMON.]

Spruce Family.

Our last paper closed with the enumeration of the pines of California, composing the first genue of the four large genera belonging to the tribe *Abietinæ*.

The other genera are *Picea* (from which a small genus, *Tsuga*, has lately been seperated), *Abies*, and *Larix*, commonly called epruce, fir, and tamarack, the two first of which, for reasons following, we will consider together. The flowers of these genera are similar to the first genus, *Pinus*, to which the older botanists referred them, calling them all pines, but subsequently they were separated under the name of *Picea*. Soon after a part of the species was erected into another genus and called *Abies*. Other botanists extended the name *Abies* over the whole group, and *vice versa*. Thus the two names, *Picea* and *Abies*, have heen much interchanged, and often one of them dropped entirely, causing great

Confusion from Misnaming.

This confusion extended to the common names, spruce and fir, as well, and still continues to thie day.

The consolidation of this group into one genus was based upon the fact that they have several characters in common, to wit: cone-scalee flat, not thickened at apex, nor spurred; leavee single, short, scattered, not sheathed at base. Their separation into two (and finally, lately, into three) genera, is hased upon differences in the characters of their fruit—by most authorities regarded as very important—to wit: Spruce cones depend from any of the branches, and fall off, entire, at maturity, like the pine; fir cones stand erect upon the upper limbs and fall to pieces at maturity, leaviug the core persistent.

Ae stated, much confusion and controversy has been connected with this large and interesting group of trees; and intelligent lumbermen, as well as scientists, are found calling species by opposite names, according as they follow different authors, but the matter has been recently settled as above, as well as by microscopic examinations, and we, who live among the noble trees, ought to avail ourselves of the facts, study the distinctions, get them well fixed in our minds—then hereafter, eet a proper example, thus clearing away the confusion.

Engelmann's Dictum.

Dr. George Engelmann, of St Louis, the closest student of our trees in America, has just published an exhaustive description of the American firs, in which he says: "I follow Link in his name, definition and limitation of the genus *Abies*, which seems to be a very natural one, comprising the silver and balsam firs."

The synonym *Picea* is the older name, and enjoye the Linnæan prestige, hut is contrary to classical (see Pliny and othere), and to philological authority. The name *Abies* is generally adopted in Europe, while *Picea*, heretofore priucipally used in England, is now being abandoned.

Picea is the pitch tree, and properly designates the spruces. Tournefort, the elder De Candolle, Gray and others, comprise under the name *Abies* hoth the spruces and firs; "hut," the Doctor declares emphatically, "the generic distinctions hetween them are abundant, and hased on floral and fruit characters, as well as upon the leaf anatomy."

Spruce Family.

The spruces are distinguished from the firs by their depending coues growing from any of the limbs, with persistent scales and hracts, and, generally, by their scattered limhs and leaves; also hy microscopic anatomy, as shown hy Eugelmann. They comprise two genera, *Picea* and *Tsuga* forming the second and third genera of the *Abietinæ*, as stated, differing from each other hy hut few characters detected at a distance; five species in California.

2d. genus, *Picea*, from *pix*, "pitch." The true spruce. Leaves four-sided, and generally scattered all round the long twigs, leaving, when they fall, the foot-stalk, persistent, ligneous and prominent. Bracts concealed heneath the cone-scales.

1. *Picea Pattoniana*, (*Abies Williamsoni* of English authors). "Silver spruce" of California. Grows sparsely on the peaks of the Cascades in Oregon and in the Sierra of California (near Webber and Tahoe lakes, and on Lassen,

Stanford and Tellae peaks). It is an exceedingly graceful tree, tall and tapering, with longest limbs below, all starting out downward from the trunk, thsn outward, lastly upward. Cones iu clusters at the ends of branches; purple; small; two to three inchos long; ollliptic; bracts short, concealed by the few concave, close scales, but half opening at maturity.

2. *Picea Sitchensss, Bony.* "Menzies' spruce," of Oregon and upper California. A graceful trce, 80 to 120 feet high, with long pendant twigs; timber yellow, tough; hence prized for shipbuilding; cones elliptic, two and three inches loug; leaves on lower limbs often 2-ranked.

3. *Picea Mertensiana*, Lindl. "Hsmlock spruce" of Oregon and upper California, coast; 100 to 150 feet high. "The uorthern forms," according to Dr. Kellogg, "densely foliaged, but exceedingly graceful in their arching branches; the southern with perfectly horizontal spray, airy and gauzy, giving an effect beautiful beyond description." Timber white, soft, worthless; cones very small, one-half to one inch long; ovate; leaves generally 2-ranked.

Certaiu species of the genus under consideration have lately heen separated from the preceding and named *Tsuga*, the "false spruce." Leaves flat, uot four-sided, and generally in two ranks on opposite sides of twigs, falliug off entiro, leaving a round scar on the bark. Bracts, oxserted.

4. *Tsuga Douglasii*, Lindl. "Douglas spruce." "Black spruce" of the Rocky mountaius, and of the California coast and Sierra ranges. A common and often immense tree, 200 to 350 feet high, with a rongh, black barked trunk 8 to 15 feet iu diameter. Timber soft but stroug, composing the great lumber wealth of Oregon and Washington; cones ovate, three inches long; hracts much exserted, three-parted; leaves light green, arranged iu spirals around the hangiug twigs.

5. *Tsuga macrocarpa*, Torr., or *Tsuga Douglasii*, variety, *macrocarpa*, Vasey, the "big-coned spruce" of the San Bernardino mountains. A rare tree, differing from the typical Douglas spruce in its smaller size, guarly appearance and the great size and quantity of its cones, 8 to 11 inches long, and lying a foot deep beneath the trees.

(To be Continued.)

The Engineer.

A Review of the Past Year.

In engineering, the year just past can scarcely be said to have afforded much matter of iuterest; for beyond the progress made upon a number of important works of improvement, aud the completion of a few others, there is but little to notice. The only specially novel engineering undertaking to record is the successful transfer of the Cleopatra Obelisk from Egypt to England—to its present site on the Thames embankment in London. The engineering skill is displayed in this work by the contractors has been highly praised by the leading professional journals of England, and appears to he deserved. The practical completion of the great Sutro tunnol was by all odds the most interesting and important performance in this department of the United States during the year. The improvements works at the mouth of the Mississippi do not appear to realize the sanguine expectations and predictions of their projector to the extent that his many warm advocates had hoped. It would, bowever, be premature to pass judgment at this time upon the merits of the controversy that is known to exist between Capt. Eads and the U. S. Engineering dcpartmeut, on which our readers are generally informed.

The partial completion and practical introduction of an elaborate system of elevated street railways, in New York city, is an event of special interest, and, though some serious objections have been found against them, their utility in solving the problem of rapid transit is generally admitted.

The canal across the American isthmus attracted considerable attention at the scientific congresses assembled in Paris during the late exposition, and the results of the several explorations, just made under the direction of the French naval officer, Lieut. Wyse, for a route across the Darien isthmus, enjoyed special prominence. The periodical sending out of expeditions to survey ground that bas been already surveyed and resurveyed in the hope of finding some passage across this troublesome ueck of land, that may, perchance, have escaped the observation of previous expeditions, might as well bs stopped hefore tbe performance becomes farcical. Our own engineers have explored every ridgo, valley, and stream along the whole isthmus from Panama to the Gulf of Sau Blas; and their reports, which are full and exbaustive, fully confirm Trautwine's conclusions, that a canal across tbe isthmus at the narrowest point, from the Gulf of San Miguel to the Gulf of San Blas, with a tunnel of 10 miles in length, at a cost of $300,000,000, is the best that can be donc in a region where nature has interposed so many obstacles. Whether so stupendous a work will ever he undertaken hy private capital and enterprise may well be douhted, and the prediction may, we believe, he safely made tbat the inter-oceanic canal across the American Isthmus, if ever accomplished, will be done by the uuited efforts of the leading commercial nations of the world, in the interest of the world's commerce and of civilization. *Verbum sap.*

The Cape Cod ship canal, a project that has been periodically agitated for a century aud a half, found an able champion, last year, in Mr. Clemeus Herschell; and several schemes for the construction of a direct water-way across the peninsula of Florida were brought forward more or less prominently.

Regardiug the Channel tunnel to connect England aud France, the reclamation of the Zuyder Zee, and the flooding of the Sahara, brilliant projects that havo attracted more or less attention on the part of the engineering world for several years past, nothing has beeu done beyond the regular amount of discussion. The St. Gothard tunnel, the greatest eugineering work at present under way in Europe, met with a serious set-back, last year, hy the refusal of the Swiss cautous to vote the surplus of subsidy which the unforeseen expensiveness of the work has rendered it necessary to provide. The dilficulty, however, appears to have been satisfactorily adjusted.

In mechanics, we have uothing of special importauce to report to the credit of the past year. —*Engineering and Mining Journal.*

Useful Information.

Glass Clothing.

It may seem a transparent falsehood to state that people wear glass clothing, but this sort of apparel may yet come into use. Glass would seem to be about the last thing to think of as clothing; but it is nevertheless true that glass-cloth is being made in Germany. If people who live iu glass houses should not throw stones, it is to be hoped that bad boys clothed in glass may give up their stone-throwing propensities, not to mention snow-balliug, and, if so, the era of glass clothiug will be hailed with pleasure. The following particulars of the process are translated for tbe Detroit *Free Press* from the *Hevrnhut*, by Hermaun Fruecauff, of that city: "At Gaudenfrei, the artist and the glass-spinuer, A. Prengel, of Vienna, has established his glass businoss, offering carpets, cuffs, collars, veils, etc., of glass. He not only spins, hut also weaves glass before the eyes of the people. The otherwise brittle glass he changes into pliable threads, and uses them for making good, warm clothing. It sounds like a myth; hut Mr. Prengel introduces certain ingredients, which are his secret, and therehy changes the entire nature of the glass. He has just finished a white, curly glass muff for a lady in St. Petersburg; he charges 40 thalers ($30) for them. Also ladies' hats of glass, with glass feathers. A remarkable feature of this glass material is that it is lighter than feathers. Wool made of glass cannot he distinguished from the genuine article. Mr. Prengel's glass inventions are something so extraordinary and useful for clothing, etc., as glass is a non-conductor, that it will probably cause an entire revolution in dress material."

Buckwheat.—The name comes from beech-wheat, hecause the seed resembles the beech-mast in shape, but has been corrupted iuto buckwheat. It is a native of Asia, and was brought into Europe either by the Crusaders 600 or 700 years ago, or into Spain by Moors. It did not reach England until within the last 250 years, but just in time to come over with some of the earliest settlers in America. It was first cultivated by the Hudson river Dutch, and by the Swedes on the Delaware. The Dutch meution it as early as 1616, and from what they say on the subject it is quite certain they then knew quite as much about buckwheat cakes as was ever worth knowing. From these two centers of early settlement the cultivation spread over New York, New Jersey and Pennsylvania; following the colonists into the new homes they cleared up in the forests as certainly as the honey bee follows in the pathway of the western pioneer, making his home wherever the white man huilds his cabin. These three States have always been immense producers of buckwheat, growing two-thirds of the whole quantity raised, now amounting to many million bushels annually. Its cultivation is rapidly extending through the north and northwest, until the present annual product is 30,000,000 of bushels.

To Color Zinc.—The *Technologiste* gives the followiug process for permanently coloring zinc. The metal must be quite pure, as must also the materials of which the following hath is composed: Tartrate de cuivre, 30 grains; potasse caustique, 40 grains; eau distillee, 400 grains. After heing submitted for two minutes to the action of this hath, the zinc takes a violet tint; after three minutes immersion, it becomes a deep hlue; in four and a half minutes, green; in six and a half minutes, purple.

Cooling Hot Journals.—You Heeren proposes a method of cooling hot journals hy a mixture of sulphur and oil or grease. The fine metal dust formed when a journal runs hot, and which strongly acts upon both journals and bearing, forms a sulphide of sulphur. This compound, which grows soft and greasy, does not cause any appreciable amount of friction. It has been very successfully used by the steamers of the North German Lloyds.—*Iron Age.*

Warning to Locomotive Engineers.—Drs. Charles M. Cresson and Robert E. Rogers, of this city, says the Philadelphia *Ledger*, well-known as experts in chemistry and dynamics, were appointed by the Reading Railroad Company to inquire iuto aud report upon the causes of the recent explosion of the boiler of the express locomotive "Gem," at Mahanoy City, by which five lives were lost. Their report, which is designed to cover the whols scope of a most careful investigation, is not yet made public, but they have arrived at the following specific conclusion, which we give iu their own language: "We are, therefore, of the opiuion that the explosion of the boiler of the locomotive "Gem," was produced hy the projection of foam upon the heated crowu hars of the furnace, caused by suddeuly aud widely opening the safety-valve at a time wheu tho water had been permitted to get so low as to overheat tho crowu of tho furnace." This is an important matter that should be carefully noted by locomotive aud other engineers.

How to Wash Silks.—Lay the silk smooth on a cleau board, rub soap upou it, and brush it with a rather hard brush. The amount of brushing requisite will depend on the quantity of grease upon the silk. When it has been sufficiently brushed with the soap to cleanse it from grease and dirt, it should be well brushed both sides with clean cold water. A little alum infused in the last water with which the silk is brushed will preveut the colors from spreading. Should there be any patches of grease upon the silk, they should be removed as previously described, for by the applicatiou of a little camphine and alcohol. Folding or wringing silk when wet must be scrupulously avoided, as creases made in silk when wet will never disappear; and, in like mauuer, *hot suds* must not be used for washing silks, as it will in most instances remove the colors.—*Cassell's Household Guide.*

Brier Root Pipes..—Much of the wood used for making the so-called "brier root" pipes is derived, it appears, from Corsica. The white heath, or *bruyere* (of which "hrier" is a corruption), grows in great luxuriance and very abundantly among the trees and shrubs which form what is called the "marquis" covering the mountain sides. In the course of the last few years, since brier wood pipes have become such a large article of trade, the heath trees have become a source of lucrative industry. The roots are dug up and cut into rough forms of tobacco pipes by circular saws worked by the water power of the mountains streams. The pieces, when cut up, are sont in sacks to France, and thence to America, to be eventually manufactured into "hrier root pipes."

The Vitality of Wheat.—The seeds of the wheat possess a vitality which resists intense cold. A sample of the wheat left by the *Polaris*, in 1871, in 81° 16′ north latitudc, aud exposed to a temperature varying from that of summer to that of winter in that position for five years, was sown last year by Dr. Schanburgh, of the Botanic Gardens aud Government plantations, South Australia, and out of 300 grains, 60 germinated and produced plants, three or four feet high, with cars coutaining 30 grains each.

Floating Soap.—A soap that would float upon the water would he often a very convenient thing. Somebody has patented such an article, which is made by simply inserting a piece of cork into the center of the cake. The same result might be obtained by forming the cakes with a small cavity iu the center.

Good Health.

Vegetable Carbon.—The carbou contained in beans, peas, cornmeal, oatmeal, aud other farinacea is of a different character essentially from that which exists in animal fat. The chemist may not find a difference in his last analysis, so far as the elements are concerned, but the dietetic effects are different positively. One may eat largely of vegetable food without the resultant functional derangement which is induced by eating largely of animal fat, notwithstanding that the quantity of carbon may be actually greater by analysis in the vegetablo food. No kind of food will supply the loss of bones. Eat good, nourishing food when suffering from any local disturbauce, like a felon or boil; but avoid oils, fats, grease, and alcoholic stimulants. Eat fruit liherally, so that the blood shall be kept cool and the digestive function in good order.—*Phrenological Journal.*

Health and Happiness.—One of the most important means of securing and retaining good health, is to live happily. Some one has beautifully said: Live in the sunshine at home, although clouds of perplexity environ you in the business marts. Bring smiles into the realm where so much heart service is expended for your comfort. Be a welcome presence to the smallest child, even to the very house dog, to puss upon the rug. A beneficent and loving spirit diffuses its influence from the highest to the lowest. Enter the home as you would some pleasant, safe retreat, where love and pieace await you, leaving behind all that annoys and worries and disturbs you outside. As before marriage you always revealed your better self alone to the eyes of the beloved, so continue to be that higher self throughout.

Gluten and Starch in Wheat.

For the purpose of human food the most valuable coustituents of a grain of wheat are starch and gluten. Starch forms on ths average about 60% of ths kernel; it is ons of the commouest and important articles of food. Gluteu is even more nutritious than starch, its composition being more nearly that of animal substauces, but it is fouud in the wheat kernsl in much less quantity than the starch; in Ohio wheats it may amount to 10% or possibly 15%, while in drier climates the propertion is greater. In additiou to the value of gluten as food, it has properties which make it especially valuable in combination with starch for making bread. It forms, with water, a most tenacious paste, and when fermentatiou or chemical action is set up in dough, this paste forms a thin pellicle about the bubbles of carhonic acid gas as they are produced and retains thom. This retentiou of tho gas causes the dough to expand or rise, so that when haked in this couditiou the hread comes from the oven thoroughly vesicular or light. A flour exclusively of starch or containing insufficient gluten, will not retain the gas, and, consequently, does not rise; the more gluten there is in the flour, the more perfectly the dough made of it rises aud the lighter and hetter the bread. Flour from soft wheats, which contain abundance of starch, but are deficient iu the gluton, command hut a low price for bakers' uso in Eastern cities, while flour from flinty wheat, which is more glutenous aud strong enough to raise itself not only, but possibly a mixture of cheaper flour and a good quantity of water, is in good demand, and at higher prices.—*Health Almanac.*

Sources and Constituents of Cod-liver Oil.—The fish from which the oil now found in commerce is obtained is said by the *British Pharmacopœia* to be *Gadus morrhua*, Lin. In the *U. S. Pharmacopœia* it is said with stricter accuracy to be derived from that fish, "and other species of Gadus." The following are the species of fish from which the oil is ohtained: The codfish, the pollock, the coal-fish, the burhot, the ling and the dorse. The chemical substances which cod-liver oil contains are margaric, stearic, and cetylic acids, all of which are white solids; oleic acid and volatile acids, which are liquids; glycerine and biliary matters, and gaduine. These are shown in tho relative proportions iu which they are contained in the oil, and form a very instructive series. Besides these bodies cod-liver oil contains minute quantities of iodine, bromine, and phosphorus. To each of these its medicinal properties have been referred, hut the minute quantities contained iu the oil, the difference of opinion among authorities, and the fact that other animal oils are found to produce similar effects, seem to prove sufficiently that cod-liver oil is useful chiefly as an easily digested fat.

Pure Air.—Pure air is an essential of pure blood. Pure blood makes stout nerves; consequently pure air which makes the good hlood is an essential of the nervous system. Good nerves insure good digestion; therefore pure air, which through the blood makes the nerves good, is an esseutial of the digestive functions. Good digestiou makes good hlood, which hrings us to our starting point, and proves that pure air is the first element in animal existence. From the cradle to the grave we breatbe every moment, during working aud sleeping hours. Pure living air therefore we require every instant. Bad air is a blood poisouer. Air once passed through the lungs is poisonous. It is not only deprived of its living and life-giving constituents, hut it is loaded with impurities, especially when expired by unhealthy subjects. Fever malaria comes always from poisoned air. There may he no worse poison than the poison emanating from the skins and lungs of a mass of human beiugs If therefore you would escape "hlood-poisoning" have constant free ventilation.

The Morning Cough.—The mucous rheum which calls out the morning cough is due to the changes of temperature to which the lining membrane of the air passages is exposed in cold and stormy weather. People pass rapidly from in-door to out-door temperatures, and tben changes in the vascular supply of tho mucous membrane of the air passages are set up. If everybody at all times only hreathed through the nose, the inspired air would be warmed hy passing over the coils of blood-heated plates which exist in the nose for that purpose, and would not affect the air passages hehind the turhinated bones. But such is not the case; they probably commenco to talk, and in doing so draw in by the mouth cold air, which, on mixing witb the residual air in the chest, lowers its temperature, and then a fluxionary hyperæmia follows, and after it, in its train, a mucous rheum. The best plan for persons who are subject to colds and coughs to adopt, is to keep their mouths closed; talk as little as possible, and avoid stopping or standing still. If one out of doors keeps moving, and with his mouth constantly closed, there is very little danger of taking cold or contracting a catarrh.

Parasitic Skin Diseases.—Editors Press: —The following remedy I would recommend as a safe and reliable cure for skin diseases of the above class, having found it the hest of all the various remedies given in the *Materia Medica*: Two grains of chlorido of zinc to one ounce of distilled water, and use twice a day as a lotion. —Reader.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, Feb. 8, 1879.

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Assessment Notice—Summit Mining Co.

The Week.

The past week is without domestic events of importance, except the accomplishment of the compromise between the Sutro Tunnel Co. and the mine owners. This will have a very important bearing on future operations on the Comstock. As the snowfall on the Sierra Nevada has been light and but little impacted, the prospect for an extended water season is not encouraging. In the mountain streams there is water enough running to waste to insure prosperity to both the farmer and the miner, were it thoroughly utilized to that end, as it is to be hoped will soon be the case. The low stage of water in our rivers, while it is a detriment to some interests, proves beneficial to others. Good crops will this year be raised on the reclaimed tule land, where all was lost through the breaking of the levees and their overflow last year. And so, while the hydraulic miners may suffer from an inadequate supply of water, the low condition of the rivers will favor those who by wing-damming or otherwise, carry on operations in their beds. It is, nevertheless, the case that an excessively dry season is prejudicial to most of our leading industries, admonishing us of the importance of our constructing ditches and reservoirs for economizing our surplus water and turning it to practical account. The threatened drouth has already had the effect to arouse public attention to the importance of this fact. Schemes for the construction of irrigating ditches, that had been suffered to remain in abeyance, have lately been revived, while many new ones have been planned in those sections of the State where their aid is most needed.

Mr. A. C. Knox, our traveling agent, has started out on a trip through Solano, Yolo and Colusa counties. We hope all our friends will give him what information he desires, and also assist him in increasing our subscription lists.

Openings and Opportunities for Unemployed Labor.

With the late rains the prospects for a good business year in California have been measurably improved. Although we have not yet received sufficient rain to insure for our farming and mining interests the fullest possible prosperity, we have still had enough to make certain for these all-sustaining industries a tolerable success. This is matter for congratulation; the more especially, as our domestic labor market is just now greatly over-stocked, with the likelihood of early receiving fresh and perhaps large accessions from the Eastern States and Europe. Our army of unemployed toilers is already large, and when augmented by this threatened increase from abroad, will be swollen into unwieldly and may be troublesome proportions. With the prospect of so much surplus labor accumulating on our hands, it becomes the duty of the press to point out, as far as may be, the best fields that seem to present themselves for its ready and profitable absorption. It is said that Horace Greeley when applied to for advice, as to the best place for making homes, or finding work, always counseled the applicant to go West. This was no doubt good advice to give in New York, but would not do for San Francisco, since, if followed, it would carry the emigrant to the Sandwich Islands, and, if he kept on, to the empire of China, both poor places for a white man to go to. The Californian in search of work or a place to settle, may go towards any other point of the compass than this, with a fair chance of finding such offer, opening or opportunity as he is looking for, or, as will do to accept.

Let it be premised, however, at the outset, that the era of big wages, rich strikes, and suddenly acquired fortunes is over in California. The "flush times" have vanished with the pioneer days, and can come no more. They must not be expected. We have reached a stage in our industrial progress, that necessitates the great mass of laborers to accept a low wage, and compels capitalists to be content with moderate returns. It will not do as aforetime to stand out for high prices, nor to depend for success on mere streaks of good luck. As a general rule fortunes, or even a competence, is not now to be secured, except through the instrumentality of hard work, while saving has come in as a new and necessary factor of accumulation. Let all who are in want of work and desirous of getting ahead, bear this in mind, and manfully face the inevitable. We will not here read this class a homily on the necessity of their otherwise moderating previously formed expectations, the importance of their practicing sobriety, economy, industry, etc.

It is, of course, generally understood that for the services of artisans, and most kinds of mechanics, craftsmen and others engaged in special callings, there is on this coast no great demand. The class of laborers most required are farmers, miners, teamsters, carpenters, blacksmiths, etc. In certain localities lumbermen, woodchoppers and charcoal hurners are wanted; the first named being needed in the great redwood forests along the northern coast of California, in the lumber districts about Puget sound, along the Columbia, and in the pineries of Truckee, Washoe, Alpine and elsewhere along the Sierra Nevada. As loggers, Maine men are preferred at these places, Canadians being mostly employed as woodchoppers. These men are all paid pretty good wages for the time they are engaged, which, in the Sierra Nevada forests, extend from June to December, work being also somewhat interrupted during the winter elsewhere. The charcoal burners find employment chiefly in the base metal districts, such as Eureka and Tybo, in the State of Nevada, also in Inyo county, California, and in many parts of Utah and Colorado, where they prepare this fuel for the base ore smelting works. The business is largely in the hands of Italians and other foreigners, as they understand it well, and manage to make it remunerative.

Farm hands, teamsters, carpenters, blacksmiths, etc., find, as a matter of course, more or less employment everywhere. With the California farmer there occur two busy seasons during the year; seed time, extending from November to March, and harvest, extending from May to August. During the intervals between these periods he is apt to dismiss most of his help, who loose this time, being unable to get work elsewhere. Most teamsters own their animals and are self-employers, those on hire receiving generally good wages. To those who wish to engage in farming on their own account, nearly all parts of the country present fair openings, provided they have some means to begin with; and if they have not, it is as easy to start here under such conditions as in any other part of the world. Oregon, considering the cheapness of land and the certainty of the crops, presents as favorable chances for grain-raising as any other part of the coast. For fruit culture, the foothills of California are not excelled, this being a pursuit that should prove inviting to many. Dairying is a profitable business where there exist even tolerable facilities for carrying it on. In the vicinity of large towns or prosperous mining camps, an acre or two of ground devoted to the cultivation of choice grapes and fruits has frequently been made to yield a good income. So, too, a small hog, milk or chicken ranch has, in like manner, often proved a source of wealth to the owner. To a patient sort of man, who will attend carefully to his sheep, there is amongst us hardly a better business than wool-growing. Stock-raising is also a very sure, and in the end, profitable pursuit, Nevada, Arizona, and, in fact, nearly all the outside States and Territories abounding with fine sheep and cattle ranges, either wholly vacant or but little occupied.

Then the mines are far from being depleted. Indeed, there is here room for all. It is, to be sure, a rough and laborious life, but there is yet much about mining that ought to draw an ambitious, self-reliant man strongly towards it. To those who wish to engage in this vocation, one section of country presents few advantages over another. Arizona appears to have the call just now, and to the adventurous and strong, able and willing to endure privations and hardships, it offers, no doubt, a very attractive field, its great mineral wealth being pretty well established. But, for that matter, there would seem to be mineral enough almost everywhere. Glowing accounts come to hand of rich ore finds in Nevada, Utah and Colorado, and, in short, from one end of the coast to the other. An extent of placers is said to exist along Snake river and its tributaries sufficient to give profitable employment to a large number of men. Northern California and southern and eastern Oregon also afford good opportunities for engagiug in placer mining. Some diggings of this kind have lately been found in San Luis Obispo, which, according to the local press, promise to yield wages to several hundred men, and perhaps more. There are, all along the gold belt of California, places that could be made to pay fairly through the aid of a little money and the application of some hard labor. To such as are willing to work and to wait, the chances of achieving a final success at gold or silver mining are about as good now as they ever were. Industry, energy and perseverance seldom fail to bring the miner out all right in the end.

Bullion Product of the Principal Mines in 1878.

The following figures, obtained from the various mining companies having offices in this city, or derived from other reliable sources, show the amount of bullion turned out by most of the prominent companies during the year 1878, the yield of the hydraulic, drift, and quartz or vein mines being so segregated as to denote the yearly product of each. Occasionally the officers of these mining companies have declined to give the product of their respective properties; sometimes because the amount was too small to make a respectable showing—oftener, however, for the opposite reason, these parties being not over-desirous of inviting official attention to their large revenues. These tables do not by any means contain the names of all the companies that make a very considerable bullion production, to say nothing of the many small ones that turn out a large quantity in the aggregate, but are too numerous to be individually mentioned.

Hydraulic and drift mining are not prosecuted on any very large scale outside of California. In Oregon, Idaho, Montana, Colorado and Dakota some hydraulic operations are carried on, but the auriferous deposits there are not so extensive nor generally so rich as in California. The net profits realized from this branch of mining are apt to be larger where the conditions are favorable than from any other class whatever, their average amounting to about 75% of the gross production made. In some cases drift operations have also proved very remunerative, though these are more precarious and as a whole much less extensive.

California Hydraulic Mines.

Milton Co	$ 540,000
Eureka, Lake and Yuba Co	300,000
North Bloomfield	320,000
Blue Banks	120,000
Other mines on the San Juan channel	475,000
Blue Tent	100,000
Mines on the Washington ridge (including Quaker Hill, Hunt's Hill, You Bet, Little York, etc.)	700,000
Placer Co. mines (including Dutch Flat, Gold Run and Forest Hill Divide	1,000,000
Sierra Co. a total of	600,000
Excelsior W. & G. M. Co. (Yuba Co.)	302,000
Other mines of Yuba Co	300,000
Spring Valley Co. (Butte Co.)	275,000
Other mines of Butte Co	180,000
Plumas Co. a total of	180,000
Shasta Co	100,000
Trinity Co	1,250,000
Siskiyou Co	750,000
El Dorado, Amador, and other counties further south, a total of	1,000,000
Total	$8,492,000

The yearly product of the

Drift Mines of California

May be set down at about $1,000,000, of which the Bald mountain claim at Forest City takes out annually about $400,000; various other mines of the larger companies making yearly clean-ups varying from $50,000 to $175,000; there being also a multitude of smaller parties who earn fair wages at this kind of mining.

Last year's product of the leading

Quartz Mines of California.

Bechtel	$ 46,000
Black Bear	155,000
Bodie	1,150,000
Comanche	170,000
Con. Amador	90,000
Empire	104,600
Hite	240,000
Idado	609,400
Klamath	60,000
Lincoln	90,000
Modock	300,000
Murchie	10,600
New Coso	75,000
New York Hill	43,000
Original Amador	73,600
Oriental Con	26,300
Plumas Eureka	451,000
Pittsburg	7,400
Standard	1,014,000
Sierra Buttes	312,200
Total	$5,028,200

Nevada.

Alps	$ 51,700
Alexander	112,700
Belmont	37,000
Con. Virginia	7,995,800
Chollar	43,800
Crown Point	32,600
Day	55,900
Endowment	60,000
Eureka Con	5,491,900
Grand Prize	641,100
Gila	33,900
Hussey Con	88,000
Hillside	131,130
Hamburg	65,000
Independence	345,800
Justice	253,800
K K Con	227,500
Leopard	154,100
Manhattan	1,221,200
Martin White	254,400
Northern Belle	614,400
Navajo	77,200
Ophir	91,400
Raymond & Ely	259,700
Rye Patch	78,900
Star	002,600
Silver Prize	7,600
Tybo Con	779,400
Trojan	78,700
Total	$19,892,230

Arizona.

Yavapai Co	$1,500,000
Pinal Co	1,100,000
Mohave Co	1,000,000
Maricopa Co	500,000
Yuma Co	250,000
Total	$4,350,000

Utah.

Ontario	$1,455,000
Christy	302,500
Total	$1,757,500

Dakota.

Homestake	$267,000
Deadwood	117,500
Father de Smet	92,000
Total	$476,500

Rapid Transit.

Another and a quicker method of traveling than that which we now possess is one of the great desiderata of the times for cities and their suburban surroundings. It is a universal necessity, and there is money in it. And practical devices, employing inventions in some instances patentable for the protection of the origiuators are wanted, and doubtful problems are awaiting solution. Civil engineers out of employment cannot do better than to go to work on their own account canvassing the local want, and pointing out the way to make it profitable to somebody. A case of this sort in hand at the present time is the Presidio cable road, directed by Mr. Hallidie. What is needed most, however, is rapid transit along the crowded thoroughfares. The horse cars are lamentably inferior. With cheaper fares and more rapid transit, everybody would ride to gain time, even for short distances. The suburbs are still practically beyond the reach of the busy citizen. It is safe to prophesy that it will not be many years before we shall have city transit in all of the large cities at the rate of 6 to 12 miles an hour, stopping only at suitable stations; and suburban transit at the rate of 60 miles an hour. Property is interested in this to the extent of hundreds of millions of dollars; while the whole population of the city is ready to make wholesale contributions to the practical engineer who solves the problem of rapid transit locally without damage to the city property holder. It involves, not merely mechanical ingenuity, but a local canvassing of the routes, and adaptations to the wants of the city.

Another and an equally practical field for ingenuity and enterprise, is the improvement of elevators, by the perfection of systems, for business blocks. This is something that must certainly come in vogue. And the increased value of the upper story offices in the heart of the city, offers sufficient inducement to the engineer as well as to the capitalist.

Aerial Telegraphy.—Among the new scientific wonders is "Loomis' Aerial Telegraphy"—talking with a telephone along any air level without the use of wires, to a distance of 10 or 12 miles. We will await Prof. Loomis' own report on the subject.

On File.—"About Patents," by G. H. K.; "Siskiyou Matters," by J. S. B.; "Amalgamation Processes," by A. B. P.; "Tanning," by T.; and letter with specimens of ores, from H. H., from Corrine.

Hydraulic Mining Engineering.

Taking a look back over this long, gradual growth of hydraulic mining engineering—with its wrought-iron piping under pressure, its improved nozzles, its blocks, riffles, grizzleys and undercurrents, which are bringing in an income for "Uncle Sam" of about $30,000,000 annually—the records of the old Rock Creek water company of Nevada City, which afterwards assumed the name of the South Yuba canal company, have

Beyond a Doubt,

On the authority of the *Transcript*, which has recently investigated them in company with Mr. James Whartenby, water agent of the company at the time, that on the 7th day of March, 1853, Matteson & Brown were engaged in mining on American hill, near Wet hill, a short distance west by north of town, and that they were the pioneers of hydraulic mining.

Matteson, it seems, was an inventive genius of much ability, and after giving considerable thought to the subject as to how the removing of gravel banks might be facilitated, he hit upon the following plan: He

Placed a Barrel

On top of the bank to regulate the head of water that was conducted to it by wooden boxes. Leading from this into the claim was a small canvas hose at the lower end of which was attached a tin branch pipe shaped like a trumpet and two feet in length. On the day mentioned (March 7th) Matteson and his partner, who had been using but eight inches of water previously, increased their order to double that amount.

Mr. Whartenby and D. A. Rich, both of whom were among the very first settlers at Nevada City, give Mr. Matteson the entire credit. They say that Chabet used a hose merely for the purpose of washing off dirt from the bedrock of his claim at Buckeye hill. For several months before

Matteson Came to the Front,

The question of introducing some plan for washing away the banks was vigorously discussed in the camp. The idea was suggested to send East for a hand fire engine; but as it would require the assistance of several men to work it, and wages were then high, it was decided to be impracticable.

George Warren, at his claim on Selby hill, was the first person who used as large a quantity of water from the Rock Creek company as

Forty Inches.

That was in March, 1853, and it made him the laughing stock of all the section.

Passing over the history of our acquaintanceship, slight as it is, with the distribution of the auriferous gravels in our own and in other countries, we have to call attention to the fact that improvements are still being made; and that there is as much room for improvement in mining methods with the aid of hydraulics as there was when Matteson began. Our readers are aware that the

Diamond Sand

Of Cherokee and the float gold of every gravel mining claim in the country, are still evading riffles to a large extent; and that of the many ingenious devices which have been tried and suggested, some of them possessing real merit, are far from being generally introduced, or even generally known. The diamond sand has a market value considerably greater than that of gold, not for ornamental but for industrial purposes; and it is a regular article of trade which the English diamond miners of Africa by no means despise. Leaving the Snake river placer miners to cope with the

Float Gold Problem

As they find it, in the Columbia river basin, let us examine, with "D" in the *Mountain Messsenger* of January 11th, a button retorted from amalgam obtained not from quicksilver placed in the sluices but from fine sand taken up from the sluices and worked by hand. In regard to this sand we were told by Mr. Crane, of the Golden Star drift mine at Alleghany, Sierra county, that, in his opinion, well-skilled miners are constantly allowing the fine gold to escape. He showed "D" two samples of sand. One was of a decided light gray color, and the other a pronounced black. A close examination of each sample revealed

A Marvelous Number

Of glittering gold particles. The sand itself is apparently a finely disintegrated magnetic iron ore, and is so heavy that it settles wherever the fine gold will settle in the sluices.

"I have," said Mr. Crane, "worked all the sand so obtained by the slow and laborious process of a common miner's pan, a little quicksilver and a grinding stone. I am

"Now Erecting

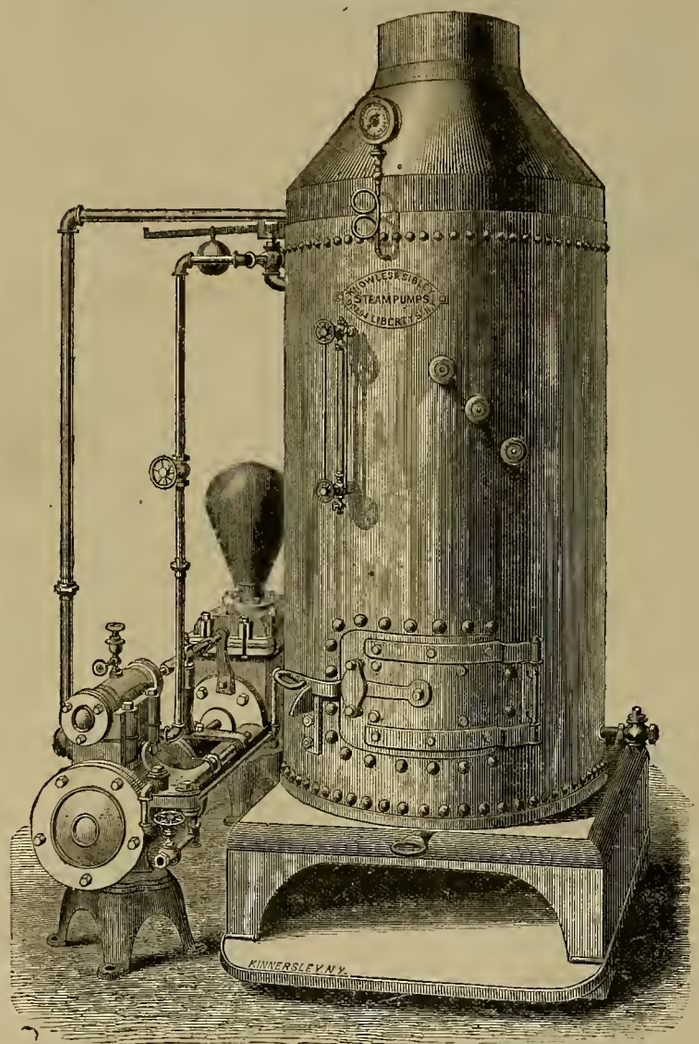
"At our mine, and will have in operation in a few days, an amalgamator of peculiar construction—the joint invention of Mr. C. P. Bowen and myself—which I confidently expect will work this sand at the rate of 50 tons a day, and save the very last atom of gold. If the miners would give their sluices close scrutiny and careful tests, the fact would be discovered that an astonishing percentage of gold is lost in defective sluices and through the carelessness of those who gather the harvest after all the work has been done."

The Knowles Tank Pump.

The engraving on this page represents a 7½-inch Knowles patent tank steam pump, with feed pump attached and boiler ready for work. This machine is used for forcing water from springs or rivers to hotels, public or private institutions, residences, railway stations, brickyards, breweries, etc. In this form it is portable and complete, and can be placed at the point from which water is to be taken, and the water forced by it to the distance and hight required.

It does not require the attention of a skilled mechanic to operate it, as it is furnished with all appliances the most complete, including steam and water gauges, gauge cocks, safety-valve, etc. Its entire management can be learned in a few hours.

The boiler is fed directly from the main pump, or a small plunger pump is attached to the piston-rod of the main pump for that purpose. The boiler and attachments are of the best manufacture. The regular (numbered) sized pumps in the price list of the agents, are calculated for feeding steam boilers and forcing



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The Kendall One Stamp.—One of the Kendall one stamp mills, which we recently illustrated in the PRESS, is running at Rough and Ready, near Grass Valley, and is said to be crushing *six* tons per day, giving excellent satisfaction. Another is running at Sonora, Tuolumne county, and there are three in Amador county. One has also gone to Carihou. When this item appeared last week, a typographical error made us say the mill was crushing *one* ton, when it should have been *six* tons per day.

Big Strike and Early Legends.

The Tuolumne *Independent* gives the following account of a recent gold find, with which are coupled some reminisences of early days in that county: Thomas Adams, who before for a long time had been in poor luck, struck a pocket the other day at Union hill from which he took $254 in two pans of decomposed quartz, with a good prospect for finding more. He had been running a tunnel into his claim, but not finding anything, he went on the surface and began digging again in a shallow hole, made there a year since. At almost the first lick with his pick he struck into this rich deposit, which was scarcely six inches from the point where he knocked off last year. This quartz vein is supposed to be a feeder of the Peck placer claim, one of the richest ever struck in the county. Capt. Peck, after whom it was named, came here in 1851, and for awhile found it difficult to make enough to keep him from starving. At this time Joaquin, the brigand, had just opened this claim, which was paying him largely. Taking pity on Peck because of his poverty he gave him a pan of dirt, which, on being washed out, yielded $25. The ingrate, knowing that a Mexican was not allowed under the local laws to hold any mining ground, associated himself with two other equally detestable characters and proceeded to drive his benefactor from his claim, which, after they had taken possession of it, yielded them many thousand dollars. After these three men had abandoned the ground, supposing it to be worked out, others came in, and opening it up further, also took from it a good deal of money. It is said that Joaquin was in like manner driven from other claims, which, with au outrage committed on his wife, so imbittered him against the whites that he became their lasting and deadly enemy. This man Peck afterwards located and worked another rich claim under Table mountain, and which, when nearly exhausted, he managed, through false representations, to sell for a pretty good sum. When some years later he was killed in the lower country by a runaway horse, his death excited little commiseration in the community where he had resided and where his sharp practices were so well known.

Sutro and the Comstockers have come to terms.

Lead is again in active demand in New York,

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Rotary Vacuum Engine.—Dr. L. B. Lawrence, Monticello, Yolo Co. Dated January 28th. This is a novel apparatus, which the inventor calls a rotary vacuum engine, and it consists of a circular arrangement of open tubes which are provided with valves at one end. These tubes are so constructed as to become charged with hot air or vapor during the revolution of the apparatus, which is mounted on a horizontal shaft. The lower end of the rim formed of these tubes, dips into a tank of mercury, water or any suitable liquid, and the continuous revolution of this rim brings the section of the tubular circumference successively below the liquid. The valves at the opposite ends of the section will be automatically closed, and the atmospheric pressure upon the closed ends of the tubes will force them continuously beneath the surface of the liquid. The heated air may be supplied from a suitable heater, so arranged to fill each section of the tube successively just previous to its immersion in the liquid, or it may be provided by a gas jet, which is alternately ignited and shut off; or, if desired, the tubes may be filled with steam or other vapor to be condensed. Suitable mechanism is connected with the axle, by which the various valves are opened or closed, or the tubes supplied with heated air or vapor.

Combined Sulky and Walking Rake.—A. Ahbey and G. Brammar, Livermore, Alameda county. Dated, January 28th, 1879—This invention relates to an improved wooden tooth combined sulky and single walking revolving rake; and the improvements consist in so attaching an ordinary single walking revolving rake to a sulky that its operation may be controlled by the driver from his seat without any one being compelled to walk behind to attend the handles regulating the detaining block which controls the teeth of the rake. It also consists in forming the connections between the sulky and walking rake so that they may be separated, and the walking rake used in the ordinary manner for rough and hilly land. The connections are simple in construction and operation and the whole device strong and practical. It admits of the use of wooden revolving teeth, while at the same time a sulky can be used and the driver may ride. The usual form of teeth in use for sulky rakes are curved metallic ones, which collect considerable dirt in the grain or hay. The revolving hand rakes with wooden teeth are usually preferred, but with their use the driver has to walk. In this device the useful features of both rakes are combined, while the combination may be broken if desired, and the walking rake used as such on hilly or rough land.

Diaphragms for Furnaces.—M. D. Haskins, Guernsville, Sonoma county. Dated, January 28th. This invention relates to an improvement in that class of furnaces in which ore is roasted by dropping in from one to another of a series of diphragms which are placed horizontally in a vertical furnace, and the improvement consists more especially in a novel method of constructing these diaphragms so that they will resist the effects of the heat, and not give way under the load. When the diaphragms are made of tile or other plates as is usual in this class of furnaces, they will not stand the combined effects of the heat and the weight of the ore, and they soon sink in the center, and eventually fall through, and render the furnaces useless. In order to remedy this, and produce diaphragms which will stand the pressure, the inventor forms them of cast iron in sections so as to be readily introduced or removed, and these sections are united and provided with a system of radiating ribs projecting below the diaphragms and sustaining its center so that when heated they will resist the tendency to sink and bend under the load.

Machine for Cleaning Fiber.—Thos. McAuley, S. F. Dated January 28th, 1879. This is a machine which is intended to dry and cleanse, or, in some cases, to cleanse alone, all sorts of vegetable fiber, hair, and similar substances. It is more especially intended for cleaning the fiber of the cocoanut bark, and consists of a revolving drum, the outside of which is composed of slats slightly separated from each other, so that dust may fall out. A number of blocks are placed within the drum with the fiber, and through the center a hot drum may pass for the purpose of drying the material when necessary.

Transmitting Power.—Wm. Meyers, Oakland. Dated January 28th, 1879. This invention relates to an improved machine for transmitting power, and the improvements consist in the combination with a driving water wheel, crank, or pulley and its shaft, of certain combination of mechanism, whereby the inventor is enabled to transmit the power either increased or diminished from that of the source, and to distribute it, so that it may be easily employed at four or more different points at once, or it may all be concentrated if desired.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of pateuts or purchasers of pateuted articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants bave not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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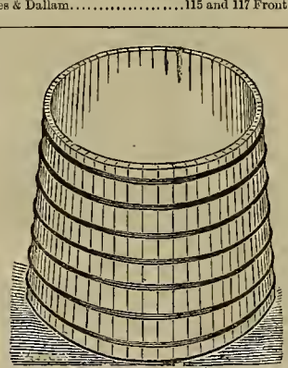

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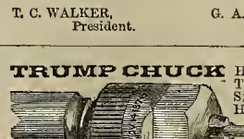

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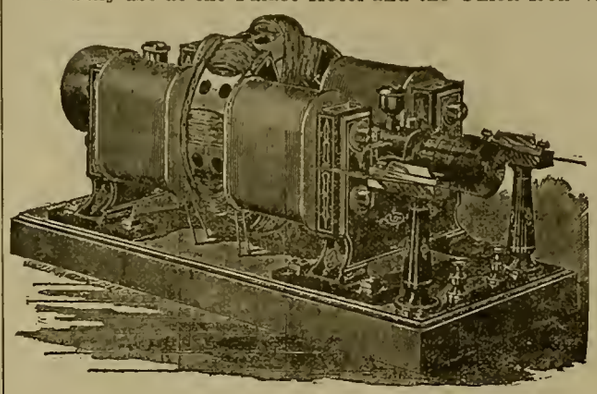

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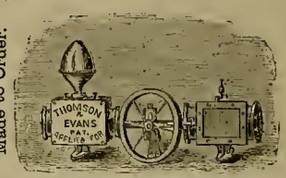

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PORTABLE ENGINES,

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Sizes, from eight horse-power to twenty-five horse-power. IN PERFECT RUNNING ORDER. Apply to

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THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per ton. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
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507 Mechanical Movements.

Every mechanic Should have a copy of Brown's 507 Mechanical Movements, illustrated and described. Inventors, model makers and amateur mechanics and students, will find the work valuable far beyond its cost. Sold by Dewey & Co., Patent Agents and publishers of Mining and Scientific Press, San Francisco. Price, $1, (post paid.

[Continued from Page 85.]

regard to the mines. They are looking well and over 70 tons per day of ore is being taken out.

ESMERALDA DISTRICT.

THE DEL MONTE SHAFT.—*Herald*, Feb. 1: Last week a vein of water was cut in the bottom of the Del Monte shaft which necessitated an increased number of strokes hy the pump, and now quite a large stream is flowing down the canyon from the company's works. This affords the town a good supply of water.

SHAW DISTRICT.—*Silver State*, Feb. 1: This mining district, discovered last fall, is situated 27 miles north of Winnemucca on the east or Paradise side of the range of mountains which divides Quin's river and Paradise valleys. The Eclipse mine, the first located in the district, runs as far as developed northeast aud southwest, and is about 20 feet wide. The side of the mountain below the croppings is covered with float rock, which assays from $30 to $550 per ton in gold aud silver. The Eclipse has been bonded by W. H. Howard, who has four men employed on the mine sinking a shaft. There seems to he no question as to the richness and extent of the ore, and it is confidently expected that a prosperous mining camp will spring up here next spring. The proximity of the district to the railroad and the advantages which it has in fuel and water, make the locality one of the most inviting in the country.

EUREKA DISTRICT.

MINING ITEMS.—*Sentinel*, Feb. 2: Albion stopped work for the present. About 150 men are employed at the Richmond. Nearly 200 men are carried on the pay roll of the Eureka Consolidated. From the Graut mine, on McCoy Hill, they are taking out some first-class ore. The Charter Tunnel company have au 8-inch streak of rich ore in the Needle mine, and are working at it diligently. Work at the Richmond seems to progress as usual, without hitch or break of any kind. A large amount of ore is being hoisted and sent to the smelter every day, to increase the bullion product of 1879. Black metal ore, of a high grade, has been struck iu the Prospect Mountain tunnel, at a distance of 900 feet from its mouth, and which is 600 feet below the surface of the mountain. The company have prosecuted work on this enterprise for about two years, and this is tbe first substantial indication of a return that they have met with.

REESE RIVER DISTRICT.

MANHATTAN.—*Reville*, Feb. 1: During the past week the mill has reduced 130 tons of ore of the assay value of $28,047.55. Of this amount $10,278.12 was from custom ores, $3,488.80 from tribute mines and the balance, $14,280.63, from the Frost and Curtis shafts.

WESTERN NYE.—It is rumored that negotiations bave about been completed in San Francisco for the sale of the Illiuois miue and furnace to Eastern capitalists. The Alexander mill ehut down on the 27th ult. for a few days in order to repair the conveyer and make a general cleanup. The company have since shipped five bars of bulliou.

WHITE PINE DISTRICT.

CHLORIDERS.—It is reported that the chloriders who have been working in the upper levels of the old Eberhardt & Aurora mine, in White Pine, have made the discovery of another extensive ore body. We hope the information may prove true, as it would give a large numher of persons employment. It is only a matter of time when good mines will be struck in tbe county.

ARIZONA.

MINING NEWS, ETC.—*Silver Belt*, Jan. 31: The McMillen company has men at work grading for the new mill. Four men are now at work on the Maimi mine, and good ore is still being extracted. The Gold Hill district is attracting attention, miners obtaining good results. Salter & Lieurance have commenced work on their claim, adjoining the McCormick. Some fair looking ore has been exposed. The Silver Queen shaft is down 109 feet. Crosscutting will not be attempted until a depth of 150 feet is reached. Neil Dongherty is taking 400 ounce ore out of the west half of the Richmond. The pay streak two feet wide gives that results. Balance of the vein, tbree feet, is said to be fair milling ore. The sbaft on the Alice mine is down 80 feet. For the last 18 feet there has been fair ore found, and tbis has recently improved so much that it is believed to be worth $200 per ton. The intention is to go down 100 feet, and then crosscut, when the probability is that a good body of ore will be exposed. The Brilliant lode, about six miles northwest of McMillen, promises to become a good mine. It bas been opened to the depth of 70 feet in good ehape, the shaft heing securely and neatly timhered. The vein exposed in a drift is about four feet wide, witb smooth, solid wall, and of this there is about 15 inches on the banging wall which shows hunches and streaks of ore that will assay $10,000 per ton, but taking the whole of this part of the veiu it is estimated that by assortment it will yield about $300. A company has purchased a small mill, with a view of erecting it at Tonto Basin.

THE ISABELLA CO.—G. S. Holbrook, one of tbe Directors of this Co., in a letter to the *Mining Record* says four or five of the mines "bave been so well opened and tested, that there can be no longer the least douht as to their great and permanent value." The mines have not been developed at all, as our readers very well know. The veracious Holbrook ends his effusion by stating that he confidently expected dividends in January, but might "possibly he obliged to wait until some time in February." As the Haskin mill is standing idle, no work is being done on the mines, and one of the best of the eight claims has been "jumped," that is, relocated by one of Mr. Bixhy's former hosom friends and lieutenants, the prospect of dividends being paid is rather remote.

MONTANA.

PHILLIPSBURG.—*New North West*, Jan 31: The Frue Vanners of the Hope, after a detention of three weeks to perfect certain necessary repairs to building, started up again on the 14th inst., and are now busily engaged in working concentrations from this company's immense tailing deposit. Driving the incline at the mine to tap the ore body at a greater depth is being done with dispatch. The Northwestern company, as usual, is ruuning steadily, working ores from Trout and Poorman. The water column and steam piping for this company's new pump has been placed in position in the Trout shaft by Engineer Gump. Everything now in readiness for deeper working. The Algonquin is being slowly and steadily drained, the powerful piston pump, now in position, working finely. Murray & Durfee are driving the tunnel ahead to crosscut the Blackmail. The Laiblin contract on this tunnel has been completed in an excellent and creditable manner. At Butte, the Lexington foundry is ready to fire up on its first charge wheuever the proprietor chooses to give the word "go." The quartz mines at Red Bluff are looking first-rate, and the miners there will make plenty of money when they can get their ore crushed.

OREGON.

GOOD OUTLOOK.—*Times*, Jan. 27: We are informed by parties from Josephine county that there is every prospect of Silver Creek proving a rich camp—one that will afford remunerative mining for several years to come. Favorable accounts from there are reported.

UTAH.

JACKSON.—Salt Lake *Tribune*, Feb. 2: According to the latest news from this district no ledge has been struck in the new camp, but large quantities of float have been found, and some 200 locations covering tbe whole mountain made in the hope of striking blind ledges. Of several assays made at the Reef of float ore tbe aggregate showed $1,100 in silver and $300 in gold. It seems to be pretty well settled that good ore has been found on the surface, but the ledges are deeply covered with debris and remain to be discovered by uncovering.

BULLION AND SMELTERS.—McCornick & Co. yesterday received another carload of bullion from the Watterman emelter, Stockton. Campbell, Cullen & Co. have about half completed a contract to ship 50 carloads of their bullion to a Pennsylvauia lead works. The Morgan smelter yesterday received from White & Shiloh, Battle Mountain, Nevada, two lots of sulphides, one lot assayiug $96.03 to the tou, and tbe other over $1,100. Water was turned iuto the canal of the Old Telegraph works a few days since, but it again broke over the bank and caused a further delay. The break, however, was small and was soon repaired, so that the smelter will be started up to-day, and the production of bullion recommenced. The Chicago smelter, at Rush Lake, Tooele county, which has been so long idle, will be started up to-day by Messrs. Brooks & Davis, and a successful run is expected

FOR THE YEAR.—*Silver Reef*, Jau. 25: The Ontario mill and mine, notwithstanding the burn-out in November, stopping operations for several weeks, produced during the year of '78 $1,462,373,56. On the 16th inst. its shareholders received tbeir 39th dividend—50 cents on the share and making $1,950,000 paid in dividends to that date.

MINING NOTES.—We are reliably informed that tbe ore in the Last Chance mine shows in some places a thickness of 25 feet. The shipment of bullion from Silver Reef, through Wells, Fargo & Co., for the week ending January 25th, 1879, aggregates $23,028. The Luna mine sbows a vein of ore more than six feet thick, and the foot wall not yet reached. A strike was made on the 24th inst., in the Stormont mine, which hids fair to astonish the nativcs. The compauy was employed in running down their incline in order to get at and control the water, and were keeping it on a regular grade to accommodate the car. In cutting away what they supposed to be tbe hanging wall to make place for tbe pump, the ore was broken down. Two loads of it takeu to the mill worked $471.70 per ton. The extent of tbe strike bas not yet been determined, but tbe indications are that it is extensive. Ye disgusted miner, in squads of from two to fifty, are expected in this afternoon from the played-out Paria diggings. It is not supposed that there will be any cussing. Oh, no.

PRACTICAL CHEMISTRY IN GOLD AND SILVER EXTRACTION.—Mr. C. H. Aaron in this issue discusses several mooted points in connection with lixiviation processes, which are referred to the "Chemical Section," and to those who have tbe use of the laboratories at Berkeley. For a resume of the natural and artificial solutions and precipitations of gold and silver so far as known at the time, reference may be made to a tabular statement in Bowman's study of the "Vein Geology" of the Sierra, published in Raymond's report for 1875.

News in Brief.

REV THOMAS K. BEECHER favors cremation.

FAMINE in upper Egypt is reported as dreadful.

GOVERNOR HARTRANFT signed fifty deatb warrants.

POTATOES sell in Washington Territory at 50 cents per bushel.

THE police of this city made 1,568 arrests during January.

STANLEY is announced in London for another African exploratiou.

QUAILS are very abundant in the foothills of San Luis Obispo county.

THE discount rate of tbe Bank of England has been reduced to 3%.

AN agitation on Chinese immigration is prevailing in New South Wales.

THE wild geese have commenced their northern migration; many could be seen the past week passing over this city.

HORSES are dying about Walla Walla, Oregon, with the glanders.

A NUGGET of gold worth about $104 was lately found on Silver creek, Oregon.

IN a street fight at Austin, Tex., the sheriff was killed and two other persons wounded.

THE *Transcript* says the prospects of Nevada county were never hetter than at present.

SEVERAL thousand engineers, boiler-makers, fitters and dock laborers struck at Liverpool.

HEAVY frosts in the northern coast counties have so kept back the grass that feed is poor.

MOST of the southern cities are slowly recovering from the disasters brought upon them by the war.

THE plague has made its appearance at Moscow and is causing great alarm in many parts of Europe.

THERE are 103 boys, between the ages of 14 to 19, confined in the State prison at San Quentin.

WITHIN the past three monthe 3,000 people have joined the Blue Ribbon Temperance Club in Oregon.

A STRONG feeling exists among leading colored citizens of Louisiana favoring migration to other parts of the Union.

A BILL before the Nevada Legislature proposes to exempt printing material to the value of $2,500 from execution.

SNOW on the mountains is driving the wild pigeons in large numbers down iuto the valleye of Yolo and Solano counties.

A SUFFICIENT quantity of snow has already fallen this season to admit of running the mills along the Carson river during most of next summer.

BUSINESS of all kinds is said to be improving in the Atlantic States. Work is getting more plentiful, though wages, like everything else, are low.

IN Los Angeles laundries are taxed $25 per month each; vegetable pedlars $50, and every Chinaman employed in the city in any capacity must pay $6 per month.

WHILE the salmon cannerymen on the Columbia river complain that last year's business was profitless, tbey are proposing to engage in it extensively the present year.

THE edge of Clear lake, for many yards from tbe shore, has several times been frozen this winter. Even the aborigines have been astouished at the occurrence.

SENATOR CHRISTIANCY bas notified tbe President that be will accept the Peru mission—salary $10,000—and resign as United States Senator from Micbigan.

RESULTS of recent inquiry into the origin of epidemic diphtheria in New York indicate the probability that it is frequently caused by using milk of cows affected with garget.

IT is said that a quantity of tellurium bas been found in tbe Central Hill mine, Eureka, Nev. This article is used chiefly in edging cutlery, and commands a fabulous price.

RECENT rains have furnisbed an abundance of water for mining purposes, and all claims in Calaveras, for tbe first time tbis season, are now being worked to tbeir fullest capacity.

A LARGE deposit of kaoline, a clay used in the manufacture of terra-cotta or fancy pottery, has been struck in tunnel No. 4, South Pacific Coast railroad, Santa Cruz county.

EDWARD NILES, General Ticket Agent for the Virginia and Truckee Railroad Company, was recently taken to the Pacific Insane Asylum at Stockton; cause of his insanity, losses in stocks.

REGISTRAR KAPLAN denies that tbere bas been an increase of 5,000 voters since the last election, and says that the total new registration in this city since the 19tb day of June last is only 366.

MRS. CLARA S. FOLTZ has been admitted to practice as an attorney by tbe Fourtb District Court and has opened a law office in tbis city, she being the first woman ever admitted to the bar in this State.

ABOUT 200 persons bave left Silver Reef, Utah, for the new El Dorado. Letters from the Buckskin mountains say that the crowd has gathered at a point about 35 miles nearly south of Johnson, but that no important discoveries are made yet.

SARGENT'S bill to provide a new Postoffice for San Francisco leaves the selection of tbe site to the Secretary of the Treasury, and appropriates $500,000 for the purchase of a site and the commencement of the building, the total cost not to exceed $3,000,000. Tbe Palace Hotel could be bought for that, and no better site or building could be had for the purpose.

Personal.

ARIZONA.—Ex-Mayor F. W. Blake, who has for a long time had the mauagement of the finances of tbe Peck Miuing Co., has been appointed agent and general Superinteudent of the affairs of the company in Arizona, with his office in Prescott.—*Miner, Prescott, Jan. 24th.*

MONTANA.—Robert E. Strahorn, editor of the *New West*, and autbor of "To the Rockies and Beyond," made Butte a one day visit last week. Mr. Strahorn has traveled extensively over Montana, and more, perhaps, than any other of its citizens has he assisted in making the outside world acquainted with its great resources.—*Butte Miner, Jan. 14th.*

COLORADO.—Prof. N. P. Hill, the genial Superintendent of the Central City Smelting Works, has been elected U. S. Senator, with evident satisfaction to the mining interest.

WHAT MIGHT HAVE BEEN.—In a report just forwarded to the Secretary of the Interior, Gen. Fremont says: It is interesting to speculate on what might have been, bad this southern line been already built before the war. True to the instincts of commerce the northern road has swept round through Califoruia and is entering Arizona from the west, while other great roads are converging into it from the east and north. Arizona is the natural gateway of commerce and travel between the States east of the Mississippi, and California and the Pacific Ocean. Fronting on Mexico it is in position to profit by any developments which may result from tbe awakened interests of our merchants and manufacturers in the trade of that country. You will remember that before our civil war, Congress bad directed examiuations for an overland route to the Pacific, to be made on four different lines between the 32d and 46th parallels, and upon comparison of results by the War Department, tbe *32d parallel was declared the best.* A bill was accordingly framed adopting this liue; and with a large grant of lands and money had already passed the House and wae about passing the other, when events occurring in Texas were announced in Congress, and the liue of the road thrown to the north. Passing together through this gateway of Arizona the united road will enter Mexico by a trunk line, which will be nourished by ten millions of people and the sea of Guaymas, while the braneles penetrate the States.

RESPONSIBILITY OF ARCHITECTS.—The question of holding architects personally responsible for the safety of buildings erected under their supervision, is placed prominently before the public by the action of the Institute of Arcbitects, which recently held its regular annual convention in this city. The Rhode Island Chapter of that body has framed a law which is intended to change the existing conditions by making faulty work a penal offence, punishable by fine and imprisonment. It is proposed to apply this rule to contractors, builders, and architects alike. In France, architects and builders are held responsible for a building for 10 years after its completiou. There is no reason why such a law should not be enacted here.

THE New York Immigration Commissionere report a large increase of European prepaid passage tickets over last year, and anticipate for the current year 20% more, or 120,000 emigrants. Of operatives alone, 20,000 are expected withiu tbe next few months.

THE Los Angeles woolen mills are in full operation, aud have already made several tbousand dollars' worth of blankets and flannels.

HEAVY business failures continue in England.

Our Eastern Agency.

We have established a special Eastern Agency for the PRESS at No. 38 University Place, New York City, with MR. JOHN MICHELS. He will correspond for our columns, and also receive subscriptions, advertisements, etc., for the accommodation of our Eastern friends.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

ARTESIAN WELLS WANTED.—Parties who are prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of the Reading Ranch, Anderson, Shasta County, Cal.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

HENRY R. EWALD is our general correspondent and agent for Arizona.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., February 5, 1879.

BAGS—Jobbing.
Eng Standard Wheat. 9 @ 9½
Neville & Co.
Hand Sewed, 22x36.. 9 @ 9½
24x36..... —@—
23x40..... 11 @ —
Machine Sewd, 22x36. 9 @ 9½
Flour Sacks, halves.... 8½@10
Quarters..... 5½@ 6½
Eighths..... 3½@ 4
Hessian, 60 inch..... 13 @14
45 inch..... 8½@ 9
40 inch..... 7½@ 8
Wool Sacks.
Han l Sewed, 3½ lb..46 @50
6 lb do.....[illegible] @52½
Machine Sewed.....45 @ —
Standard Gunnies....13½@14
Bean Bags..... 7 @ 7½
CANDLES.
Crystal Wax.....17 @ —
Eagle.....12 @ —
Patent Sperm..... 30@ —
CANNED GOODS.
Assorted Pie Fruits,
2½ lb.....2 00 @ —
Table do.....3 00 @ —
Jams and Jellies..3 50 @ —
Pickles, bf gal.....3 15 @ —
Sardines, qr box..1 67½@1 90
Hf Boxes.....2 50 @2 75
Preserved Beef.
2 lb. doz.....4 00 @ —
do Beef, 4 lb.doz.6 50 @ —
Preserved Mutton,
2 lb. doz.....4 00 @ —
Beef Tongue.....6 50 @ —
Preserved Ham,
2 lb. doz.....6 50 @ —
Devilled Ham, 1 lb
doz.....5 50 @ —
do Ham, ½lb doz.3 00 @ —
COAL—Jobbing.
Australian, ton.. 8 00 @ —
Coos Bay..... 6 50 @ 7 00
Bellingham Bay. 6 50 @ —
Seattle..... 6 00 @ 6 50
Cumberland.....14 00 @ —
Mt Diablo.....4 75 @ 6 00
Lehigh.....13 50 @ —
Liverpool..... 7 50 @ 8 00
West Hartley...10 50 @ —
Scotch.....10 50 @ —
Scranton.....11 50 @ —
Vancouver Id...9 00 @ —
Charcoal, sack... 75 @ —
Coke, bbl..... 60 @ —
COFFEE.
Sandwich Id, lb. — @— —
Costa Rica..... 15 @ 16
Guatemala..... 15 @ 16
Java..... 23 @ 26
Manila..... 17 @ —
Ground, in cs... 25 @ —
FISH.
Sac'to Dry Cod.. 4½@ 5½
do in cases.. 5 @ 6
Eastern Cod.... — @ —
Salmon, bbls.... 8 00 @ 9 00
Hf bbls..... 5 00 @ 5 50
1 lb cans..... 1 40 @ 1 45
Pkld Cod, bbls..22 00 @ —
Hf bbls.....11 00 @ —
Mackerel, No. 1.
Hf Bbls..... 9 60 @10 50
1a Kits..... 1 85 @ 2 10
Ex Mess..... 3 25 @ —
Pkld Herring, hx 3 00 @ 3 50
Boston Smkd Hg 70 @ —
LIME, Etc.
Lime, Sta Cruz,
bbl..... 1 25 @ 1 50
Cement, Rosendale..... 2 00 @ 2 25
Portland.. ... 4 00 @ —
Plaster, Golden
Gate Mills.... 3 00 @ 3 25
Land Plaster, tn10 00 @12 50
NAILS.
Assted sizes, keg 2 50 @ 3 00
OILS.
Pacific Glue Co's
Neatsfoot, No 1.1 00 @ 90
Castor, No 1.....1 10 @ —
do, No. 2.....1 05 @ —
Baker's A A.....1 25 @1 30
Olive, Flagulol....5 25 @5 75
Possel.....4 75 @5 25
Palm, lb..... 9 @ —
Linseed, Raw, bbl. 72 @ —
Boiled..... 75 @ —
Cocoanut..... 55 @ —
China nut, os..... 70 @ 72½
Sperm.....1 40 @ —
Coast Whales..... 40 @ —
Polar..... 45 @ —
Lard.....98 @1 00
Oleophine..... 22 @ 22½
Device's Brill't.... 22 @ 23½
Photolite..... @ —
Nonpariel..... 31 @ 32½
Eureka..... 18 @ 42½
Barrel kerosene... 20 @ —
Downer Ker..... 37½@ —
Elaine..... 37½@ —
PAINTS.
Pure White Lead. 8 @ 8½
Whiting..... 1½@ —
Putty..... 4½@ 5
Chalk..... 1½@ —
Paris White..... 2½@ —
Ochre..... 3½@ —
Venetian Red.... 3½@ —
Averill Mixed Paint, gal.
White & tints...2 00 @2 40
Green, Blue & Ch Yellow.....3 00 @3 50
Light Red.....3 00 @3 50
Metallic Roof...1 30 @1 60
RICE.
China, Mixed, lb.. 5 @ 5½
Hawaiian..... 7 @ 7½
SALT.
Cal. Bay, ton...15 00 @22 60
Common.....10 00 @12 00
Carmen Id.....12 00 @14 00
Liverpool fine.. 19 00 @— —
SOAP.
Castile, lb..... 10 @ 10½
Common brands.. 4½@ 6
Fancy brands..... 7 @ 8
SPICES.
Cloves, lb..... 45 @ 50
Cassia..... 22½@ 25
Nutmegs..... 85 @ 90
Pepper Grain.... 15 @ 17
Pimento..... 15 @ 16
Mustard, Cal., ½ lb glass.....1 50 @ —
SUGAR, ETC.
Cal. Cube, lb..... 11½@ —
Powdered.....10½@ —
Fine crushed.....11½@ —
Granulated..... 11 @ —
Golden C..... 9½@ —
Cal. Syrup, kgs... 70 @ —
Hawaiian Mol'sses 26 @ 30
TEA.
Young Hyson, Moyune, etc.... 27 @ 30
Country pckd Gunpowder & Imperial..... 50 @ 60
Hyson..... 30 @ 35
Fooo-Chow O..... 35 @ —
Japan, 1st quality 40 @ —
2d quality..... 20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., February 5, 1878.

IRON.—
American Pig, soft, ton.....23 00 @26 00
Scotch Pig, ton.....25 50 @26 50
American White Pig, ton.....23 00 @— —
Oregon Pig, ton.....26 50 @— —
Refined Bar..... 2½@ 3
Horse Shoes, keg..... 5 00 @— —
Nail Rod..... —@ 7½
Norway, according to thickness..... 6½@ 7
COPPER.—
Sheathing, lb..... 34 @ 35
Sheathing, Yellow..... 19 @ 29
Sheathing, Old Yellow..... — @ —
STEEL.—
English Cast, lb..... 16 @ 17
Black Diamond, ordinary sizes..... 16 @— —
Drill..... 16 @ 17
Flat Bar..... 16 @ 19
Plow Steel..... 8 @ 12½
TIN PLATES.—
10x14 I C Charcoal..... 8½@ 9
10x14 I C Coke..... 7 @ 7½
Banca Tin..... 18 @— 20
Australian..... 15½@ 17
ZINC.—
By the Cask..... 9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask.. 9½@— 10
NAILS.—
Assorted sizes..... 2 90@3 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., February 5, 1879.

Sole Leather, heavy, lb..... 22 @ 29
Light..... 20 @ 24
Jodot, 8 Kil., doz.....48 00 @56 00
11 to 13 Kil.....65 00 @76 00
14 to 19 Kil.....80 00 @90 00
Second Choice, 11 to 16 Kil.....55 00 @70 00
Cornellian, 12 to 16 Kil.....57 00 @67 00
Females, 12 to 13 Kil.....63 00 @67 00
14 to 16 Kil.....71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil.....58 00 @62 50
14 to 15 Kil.....66 00 @70 00
16 to 17 Kil.....72 00 @74 00
Simon, 18 Kil.....61 00 @63 00
20 Kil.....65 00 @67 00
24 Kil.....72 00 @74 00
Robert Calf, 7 and 9 Kil.....35 00 @40 00
Kips, French, lb..... 1 00 @ 1 35
Cal. doz.....40 00 @60 00
French Sheep, all colors..... 8 00 @15 00
Eastern Calf for Backs, lb..... 1 00 @ 1 25
Sheep Roans for Topping, all colors, doz..... 9 00 @13 00
For Linings..... 5 50 @10 50
al. Russet Sheep Linings..... 1 75 @ 4 50
oot Legs, French Calf, pair..... 4 00 @— —
BGood French Calf..... 4 00 @ 4 75
Best Jodot Calf..... 5 00 @ 5 25
eather, Harness, lb..... 35 @ 38
LFair Bridle, doz..... 48 00 @72 00
Skirting, lb..... 33 @ 37
Welt, doz..... 30 00 @50 00
Buff, ft..... 18 @ 21
Wax Side..... 17 @ 80

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, February 5, 3 P. M.

SILVER, 2½@2¾. GOLD In New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@18 ₰ cent. dis count.
EXCHANGE on New York, 25, on London bankers, 483@ 484. Commercial, 50; Paris, five francs ₰ dollar; Mexican dollars, 87½@89.
LONDON Consols, 96 5-16; Bonds, 106⅞.
QUICKSILVER in S. F., by the flask, ₰ lb, 40@41c.

LUMBER.

WEDNESDAY M., February 5, 1879.

CARGO PRICES OF REDWOOD.

Bough, M.....13 00	
Refuse..... 9 00	
Clear..... 23 00	
Clear Refuse..... 13 00	
Rustic..... 23 50	
Refuse..... 13 00	
Surfaced..... 20 00	
Refuse..... 14 00	
Flooring..... 20 00	
Refuse..... 12 00	
Beaded Flooring..... 23 00	
Refuse..... 13 00	
Half-inch Siding..... 16 00	
Refuse..... 14 00	
Half-inch Surfaced..... 20 00	
Refuse..... 14 00	
Half-inch Battens..... 16 00	
Pickets, Rough..... 11 00	
Rough, Pointed..... 12 50	
Fancy, Polated..... 18 00	
Shingles..... 1 75	

PUGET SOUND PINE

RETAIL PRICE.

Rough, M.....	18 00
Fencing.....	18 00
Flooring and Step.....	28 00
Narrow.....	30 00
2d quality.....	25 00
Polished.....	16 00
Fancy.....	22 50
Siding.....	20 50
Surfaced & Long Beaded	30 00
Flooring.....	30 00
Refuse.....	22 50
Half-inch Surfaced.....	30 00
Rustic, No. 1.....	30 00
Battens, lineal ft.....	
Shingles M.....	2 00

REDWOOD.

RETAIL PRICE.

Rough, M.....	18 00
Refuse.....	14 00
Pickets, Rough.....	15 00
Polished.....	16 00
Fancy.....	22 50
Siding.....	20 50
Surfaced & Beaded	30 00
Flooring.....	30 00
Refuse.....	22 50
Half-inch Surfaced.....	30 00
Rustic, No. 1.....	30 00
Battens, lineal ft.....	
Shingles M.....	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending February 4, 1879.

HIGHEST AND LOWEST BAROMETER.

Jan 29	Jan 30	Jan 31	Feb 1	Feb 2	Feb 3	Feb 4
30.181	30.208	30.207	30.164	30.172	30.010	30.020
30.122	30.136	30.132	30.105	30.055	29.797	29.812

MAXIMUM AND MINIMUM THERMOMETER.

52	53	55.8	62	61	56.5	58
43	43	44.5	46	46.5	45.5	44.7

MEAN DAILY HUMIDITY.

52	74.3	59.3	58.3	66	76	50

PREVAILING WIND.

NW	SE	N	N	N	N	N

WIND—MILES TRAVELED.

192	150	221	124	70	114	160

STATE OF WEATHER.

Clear.	Fair.	Clear.	Clear.	Clear.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

	.02					

Total rain during the season, from July 1, 1878, 9.650 in.

We have on hand some 400 to 500 lbs. of brevier, in good condition, for sale at a bargain. Will sell a part only if desired. Second-hand cases to match. Also a font of bourgeois in first-rate order, with cases. Also a cabinet and upwards of twenty fonts of good display type, not very old and but little used. Some of the fonts are large,

Printing Type For Sale Very Low.

of modern style, and what might be termed good substantial display type for advertisements and job printing.

A good proof press will also be sold at a greatly reduced price from cost.

We can fit out a good country printing office nearly complete at a moderate cost. Call and see the material.

DEWEY & CO.,
Publishers, No. 202 Sansome street, San Francisco.

Scientific and Practical Books on Mining, Metallurgy, Etc.

Published or issued, wholesale and retail, by DEWEY & CO., MINING AND SCIENTIFIC PRESS Office, S. F.

BY GUIDO KUSTEL,
MINING ENGINEER AND METALLURGIST.

Roasting of Gold and Silver Ores, and the Extraction of their respective Metals without Quicksilver. 1879.

This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and explains the why and wherefore

It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus.

It is a work of great merit, by an author whose reputation is unsurpassed in his specialty.

Price, $2.50 coin, postage free.

Concentration of Ores (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.5

ARITHMETIC MADE EASY
BY ROPP'S
Easy Calculator.

This valuable work is used by thousands of farmers, mechanics and business men, and is highly recommended for its practical utility and convenience.

It embodies an entirely new system of calculation, by which a vast amount of figures and mental labor—required by the ordinary methods—and fractions with their complexities, are absolutely avoided.

It is so simple and easily comprehended that even the most illiterate is enabled, in a few minutes, to reckon with absolute accuracy and speed; while its original and rapid methods, benefit and delight the most scholarly.

It shows at a glance the accurate value of wheat, corn, rye, oats, barley, cattle, hogs, hay, coal, lumber and merchandise, from one pound to a car load, and for any price the market is likely to reach.

It gives the interest, simple and compound, on any sum, or any time, at six, seven, eight, and ten per cent.; the exact measurement of boards, scantlings, timbers, saw logs, cisterns, tanks, wells, granaries, bins, wagon beds, corn cribs, etc., the wages at various rates, for hours, days, weeks and months; besides numerous other important methods, rules and tables.

It is printed on fine tinted paper, is well and elegantly found in pocket-book shape, and accompanied by a silicate slate, pocket for papers, and memorandum, which can be replenished in the two latter styles.

It answers the purpose of a pocket book and diary, and costs no more, although it was gotten up at great expense and labor, and is unquestionably one of the most useful publications ever issued from the press.

Price, bound in Fine English Cloth, $1.00.

Sent direct from the Eastern publisher, postpaid, on receipt of price, by P. O. order, registered letter or receipted by express. Address

DEWEY & CO., San Francisco.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—Location of principal place of business, San Francisco. Location of works, Cherokee Flat, Butte County, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 40), levied on the 20th day of December, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amt.
A. Casselli	17	4608	$230 40
L. Nusbaum	105	50	2 50
E. L. Pfeiffer	106	430	21 50

And in accordance with law, and an order of the Board of Directors, made on the 20th day of December, 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, on Tuesday, the 18th day of February, 1879, at the hour of two o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.
Office, No. 318 Pine Street, Room 6.

Griffith Consolidated Mill and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 21st day of January, 1879 an assessment (No. 1) of twenty cents (20c) per share was levied upon the Capital stock of the Corporation, payable immediately to the Secretary, at the Office of the Company, Room 48, 330 Pine Street, San Francisco, California.

Any Stock upon which this Assessment shall remain unpaid on the 26th day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, March 26th, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

GEO. M. CONDEE, Sec'y.
Office, Room 48, 330 Pine Street, San Francisco, California

Mariposa Land and Mining Company of California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the tenth day of January, 1879, an assessment (No. 15) of One Dollar per share was levied upon the capital stock of the corporation, payable immediatelvin U. S. currency to the Secretary, at the office of the Company, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, Cal., or the Assistant Secretary at the office No. 9 Nassau St., New York, N. Y.

Any stock upon which this assessment shall remain unpaid the twelfth day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the twelfth day of March, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Sec'y.

Office, Room 33, Nevada Block, No. 309 Montgomery St., San Francisco,(Cal.

Office Wide Awake Prospecting and Mining Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

Summit Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Pinmas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fourth day of February, A. D., 1879, an assessment (No. 7) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the eleventh (11th) day of March, A. D., 1879, will be deliuquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Tuesday, the eighth day of April, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine Street San Francisco, Cal.

Amusements.

BALDWIN'S THEATER.
THOMAS MAGUIRE.....Manager.
F. LYSTER.....Acting Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

Open Every Evening with the Regular Company.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.
CHAS. E. LOCKE.....Lessee and Manager

ELIZA WEATHERSBY & N. C. GOODWIN

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.
BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

ANTONY AND CLEOPATRA.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

STANDARD THEATER.
M. A. KENNEDY.....Sole Lessee and Manager.

RICE'S SURPRISE PARTY.

Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.

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GOOD LAND
IN A
FAVORABLE LOCATION,
GUARANTEEING
Sure Crops Every Year.

The Reading Ranch,

In the Upper Sacramento Valley, originally embracing over 26,000 acres of

Choice Grain, Orchard and Pasture Land,

Is now offered for sale at low prices and on favorable terms of payment,

In Sub-Divisions to Suit Purchasers.

The ranch was selected at an early day by Major P. B. Reading, one of the largest pioneer and owners in California. It is situated on the west side of the Sacramento River and extends some 20 miles along its bank.

The average rainfall is about 30 inches per annum, and crops have never been known to fail from drouth.

The climate is very healthful and comparatively desirable. The near proximity of high mountain peaks gives cool nights during the "heated terms" which occur in our California summers.

Soft well water—remarkably sweet, pure and healthy—is obtainable at a depth of from 15 to 35 feet.

Wood is plentiful and easy to get.

Figs, Grapes, Peaches, Prunes, Almonds, English Walnuts, Oranges and other temperate and semi-tropical fruits can be raised with success on most of the tract. Also, Vegetables, Corn and all other cereals ordinarily grown in the State.

A considerable amount of the rich bottom land has already been cultivated.

Deep Soil With Lasting Qualities.

The soil throughout the tilled portions of the ranch proves to be of great depth and enduring in its good qualities. It is quite free from foul growths. The virgin soil among the large oak trees on the bottom land is easily broken up and cultivated.

The California and Oregon railroad traverses nearly the entire length of the tract. There are several sections, stations and switches, besides depots at the towns of Anderson and Reading—all of which are located within the limits of the ranch.

Land suitable for settlers in colonies can be obtained on good terms.

Are offered for sale in Reading, situated on the Sacramento River, at the present terminus of the railroad. It is the converging and distributing point for large, prosperous mining and agricultural districts in Northern California and Southern Oregon. Also, lots in the town of Anderson, situated more centrally on the ranch. Lots in both these towns are offered at a bargain, for the purpose of building up the towns and facilitating settlement of the ranch.

Purchasers are invited to come and see the lands before buying here or elsewhere. Apply on the ranch, to the proprietor,

EDWARD FRISBIE,
Anderson, Shasta Co., Cal.

Mill and Mining Machinery Of All Kinds For Sale by BERRY & PLACE.
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Orders for agricultural and scientific books in general will be supplied through this office at published rates.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

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MANUFACTURERS OF

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OF ALL KINDS.

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PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

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MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

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MANUFACTURING COMPANY

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

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☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Bredie's Patent Rock Crushers and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

California Brass Foundry,

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

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THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T., care of Dewey & Co., S. F.

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BUILDERS OF

Steam, Air and Hydraulic Machinery.

Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO.

William Hawkins,

Successor to

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MACHINE WORKS,

210 and 212 Beale Street, bet. Howard and Folsom Sts., - - San Francisco.

Manufacturers of

IMPROVED PORTABLE HOISTING ENGINES,

For Mining and Other Purposes.

Steam Engines and all Kinds of Mill and Mining Machinery.

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MANUFACTURERS OF

RAILROAD AND MERCHANT IRON,

ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

HIGHEST PRICE PAID FOR SCRAP IRON.

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Hinckley, Spiers & Hayes.

(ESTABLISHED IN 1855.)

Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

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Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

PACIFIC IRON WORKS,

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RANKIN, BRAYTON & CO.,

Manufacturers of

ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERS. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

Agents for the Allen Engine Governor, Bailey Air Compressor, Howell's Improved White Furnaces, Walker's Compound Steam Pumps, Etc.

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Manufacturer of Wrought Iron Girders, Trusses, Prison Cells, Iron Roofs, Crest Railings, Finials, Fences, Weathervanes, Gratings, Iron Work for Models, Etc.

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Builders of Steam Machinery

IN ALL ITS BRANCHES,

Steamboat, Steamship, Land

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HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

ORDINARY ENGINES compounded when advisable.

STEAM LAUNCHES, Barges and Steam Tugs constructed with reference to the Trade in which they are to be employed. Speed, tonnage and draft of water guaranteed.

STEAM BOILERS. Particular attention given to the quality of the material and workmanship, and none but first-class work produced.

SUGAR MILLS AND SUGAR-MAKING MACHINERY made after the most approved plans. Also, all Boiler Iron Work connected therewith.

WATER PIPE, of Boiler or Sheet Iron, of any size made in suitable lengths for connecting together, or sheets rolled, punched, and packed for shipment ready to be riveted on the ground.

HYDRAULIC RIVETING. Boiler Work and Water Pipe made by this establishment, rivcted by Hydraulic Riveting Machinery, that quality of work being far superior to hand work.

SHIP WORK. Ship and Steam Capstains, Steam Winches, Air and Circulating Pumps, made after the most approved plans.

PUMPS. Direct Acting Pumps, for Irrigation or City Water Works purposes, built with the celebrated Davy Valve Motion, superior to any other Pump.

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Inventors and others can get First-Class Work at Moderate Prices.

After 10 years experience with inventions and other mechanical work, I am fully prepared to execute drawings, working-models and fine machinery of any description to entire satisfaction.

Brass Finishing, Pattern Making, Gear Cutting, Telegraphic and other Electrical Apparatus by competent workmen.

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Main Street Iron Works,

WM. DEACON, PROPRIETOR.

Nos. 131, 133 & 135 Main St., San Francisco.

Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

SAW MILLS and SAW MILL MACHINERY.

Double C. Reversible. 5½x12, 6x12, 7x12, 8x12, 9x14, 10x14 — 7x12, 8x12, 9x14, 10x14

ALL SIZES Hoisting Engines FOR SALE BY BERRY & PLACE

Market, head of Front Street, San Francisco.

Steel Castings.

From ¼ to 10,000 lbs. weight, true to pattern, sound and solid, of unequaled strength, toughness and durability An invaluable substitute for forgings or cast-iron requiring three-fold strength. Send for circular and price list to

CHESTER STEEL CASTINGS CO.,

EVELINA STREET, - - PHILADELPHIA, PA.

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A. J. SEVERANCE & CO.

Office, No. 320 Sansome street, Room 10.

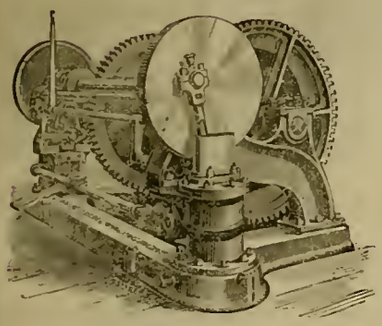
GOLD MINE WANTED.

One now paying more than expenses. Address

W. S. KEYES, M. E.,

No. 310 Pine St., Room 42, San Francisco.

A. L. FISH & CO., 9 and 11 First St., S. F., Cal.



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Air Compressors AND *AIR COLUMN.*

STEAM PUMPS, AND Pump Column,

STEAM FIRE ENGINES, AND Hose Carts.

We guarantee to raise water with these pumps 1,000 feet, single lift, without shock or jar on pumps or pipes.

Lathes, Planes, *DRILLS, &c.,* STEAM HAMMERS, Engine Governors, WINE, CIDER, AND Lard Presses.

UNION ROCK DRILL.

We offer this as the least complicated and most durable Rock Drill yet introduced.

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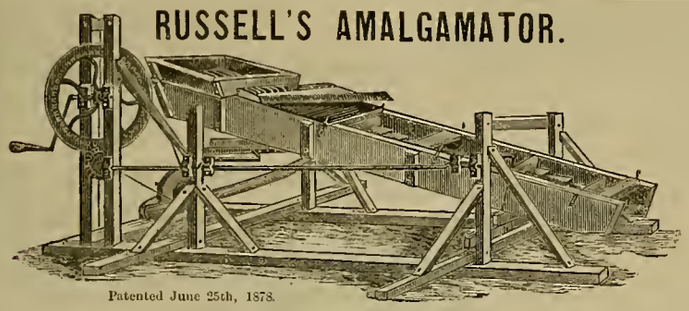
RUSSELL'S AMALGAMATOR.



Patented June 25th, 1878.

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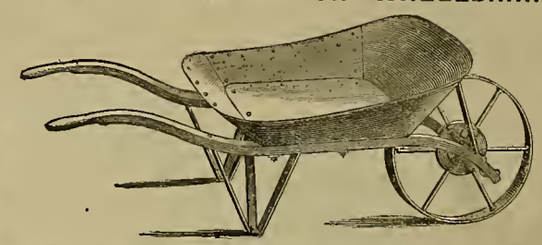

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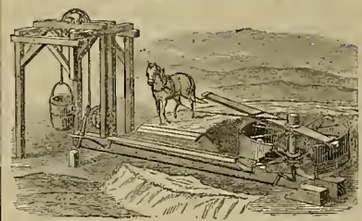

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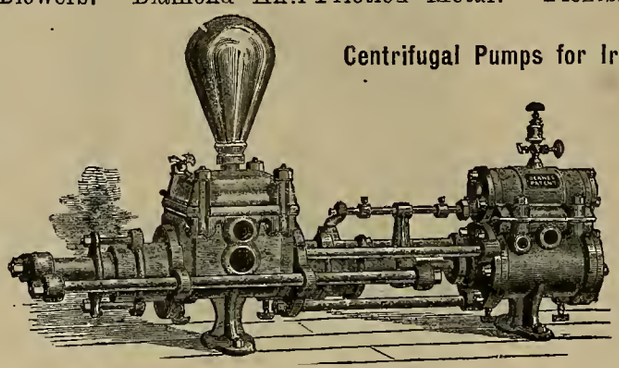

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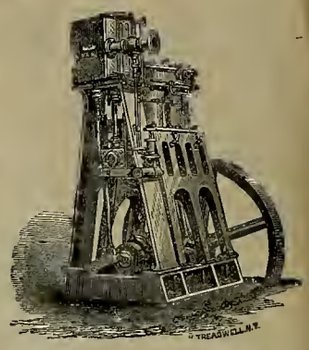

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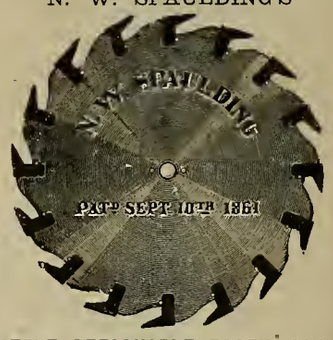

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, FEBRUARY 15, 1879. VOLUME XXXVIII Number 7.

Smyth's Tree Feller.

Wm. H. Smyth, of this city, hae recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved portahle sawiug machine and treo feller, the application of which is shown in the engravings on this page. The machiuc is intended not only to cut down treee, hut also to reduce the felled logs to convenisnt lengths for any purposc desired.

The reciprocating saw has a connecting rod uniting it with a cross head moving upon or hetween suitahle guides. These guides are loosely united at the rear end with the driving axle, so that they move ahout it as a center as the saw makss its cut. The driving crank is formed on this axle hetwoen the guides and is connected with the cross head hy a connecting rnd or pitman. In connection with the device a simple hut novel feeding apparatus is used which operates to feed the saw forward into the cut at each revolution of the crank and recipрocation nf the saw. The whole is mounted on a frame and provided with holding clamps or dogs so that it may easily hc attached to the tree or log in desired position to eut either horizontally or vertically. The mechanism is adjustahly conneeted with the driving powsr so as to hs moved from one tree or point to another without dieturhing the power.

The dogs hold the carriage firmly to the trce or log, when they are driven into the wood, so there is no motion to the carriage or frame. When the apparatus is used on fallen logs the short arms or dogs ars sccured helow and ths larger nnss on top.

The powcr is applied to this machine prefcrably hy a chain or rope passing over a pulley from the power wheel. The powsr may hs derived from an engine, horse or other convenient source, and may he connected ovcr uneven ground by tumhling rods, therehy enabling the machine to cut all the trees or logs inside of a cirele nf say 150 fcet, without moving the power. The application of the power is plainly shown in the engraviug.

The saw is only fed on the back stroke, and ths feed is variable, suitable arrangements heing made for regulating it at will.

The feeding of the saw is accomplished hy two inclined hars or plates on the saw har which are raised or lowcred hy means of thumh screws. These incliued hars operats two rack hars which in turn movs two worm gears which engage with the teeth on ths segment, causing ths guide hars and saw to move the required distance for proper feed. By hringing the inclined hars closer together or farther apart the amount of feed is rsgulated with great nicety; and once set the fsed will remain the same and hs automatic.

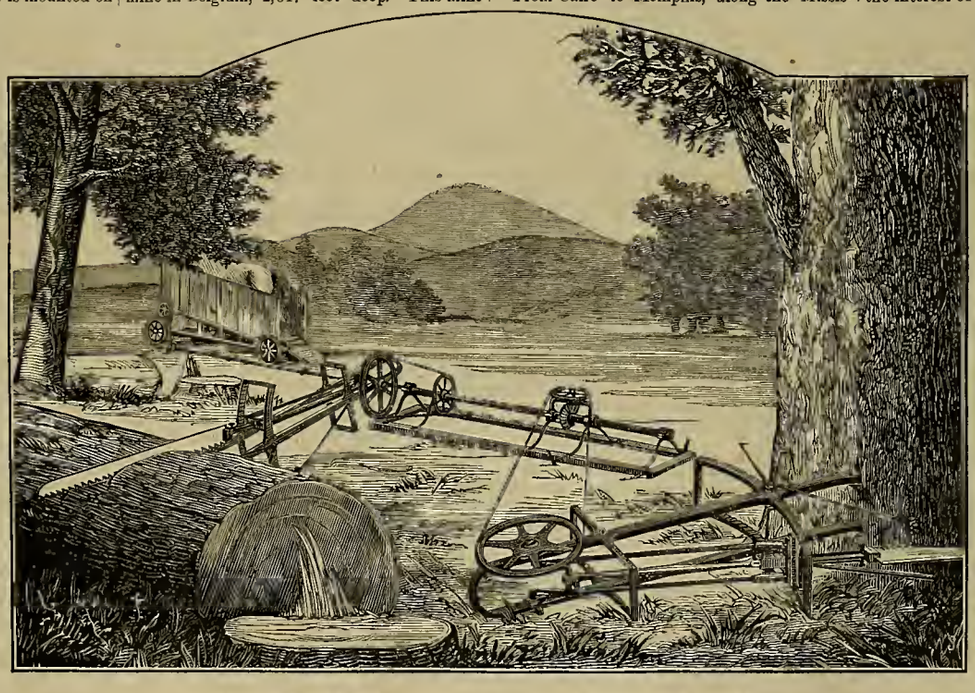
This device is ahle to cut the trees so closs to the ground that a header can pass over the stumps. In fact it can cut even with the surface or below it, if desired. Half a dozen or more saws can he run from the same central power, provided thers is power enough.

It will he seen that when it is necessary to cut a long fallen tree into sections or short logs, the driving wheel can he slid along the shaft to the extent of the frame where a hlank tumhling rod may he inserted, therehy moving the frame the length of the rod. By adding other lengths the carriage may be carried the whole length of a large tree without having to change or move the power.

This whole machine only weighs 150 pounds, and two men cau move it ahout with easc. One of the machiues can he easily run with a single horse-power, and the labor of felliug and sawing trees performed by horss iustead of manpower. The saw runs at a spced of ahout 125 strokes per minute, and cau therefore do great execution. Trees eight feet in diamcter havs been sawed with tho machine without difficulty.

In pine and redwood timber this will do very good work, and men furnishing logs to mills ou coutract will it of find the greatest ahility. In cutting logs for mincs, and getting out railroad fuel, its uso will be a great saviug.

The iuventor, Mr. William H. Smyth, can be addressed P. O. box 1308, this city, for further information.



SMYTH'S TREE FELLING AND LOG SAWING MACHINE.

THE DEEP MINES OF THE WORLD.—In reply to the letter of Mr. H. Musgrove and others, Lake City, Colorado, inquiring as to the dspth of tho deepest mins now heing worked in the world, we may say, this distinction prohably helongs to the Adalhert mine, Austria, in which the workings are prohahly carrisd on through a perpendicular shaft 1,000 meters—3,280 feet deep. This is a lead-silver mine, and has heen worked many years. The next deepest mine on the continent of Europe is the Vivisrs coal mine in Belgium, 2,847 feet deep. This mine was explored to a depth of 3,586 feet, hut no coal having been found, all helow the 2,847 level has since heen ahandoned. The Dunkirk colliery, Lancashire, England, has heen opened to a depth of 2,824 feet, and the Rossbridge colliery, same locality, to a depth of 2,458 feet, these heing the deepest mines yet opsned in Great Britain. Ths Yellow Jacket is ths deepest mine opened on the Comstock lode, its lowest level heing now ahout 2,500 feet helow the surface at the mouth of the main shaft, and 2,933 fest helow the Gould & Curry croppings, the datum line for the Comstock mines. The Savags, we helieve, stands second on the list, and the Imperial third, both of these mines heing very nearly as decp as the Yellow Jacket. We hope soon to he ahle to give these figurcs with exactness, adding somo further data relative to the deep explorations now in progress on the Comstock, with perhaps also fuller information in regard to the deep mines of Great Britain and Europe, their history, production, etc.

CITIZENS of Omaha and vicinity have shipped a car-load of flour to Glasgow, Scotland, for the relief of the unemployed and distressed in that city. Free transportation was furnished to New York hy the railroad, and hy the Anchor line eteamships thence to Scotland.

Earthquakes Here and Elsewhere.

The old, commonly accepted opinion that earthquakes wsre confined to ths Pacific coast of the United Statss is fast hecoming changed, on account of frequent ocourrence of similar disturhances in other parts of the country. Ths Pacific coast, in fact, has for ovsr 10 ysars heen free from all hut ths slightsst ehocks, while it is noticsahle that the hsavisr Eastern sarthquakes date from that tims to the prssant. The last, that of Nov. 18th, 1878, occurred in ths Mississippi valley, and traveled over an area of fully 150,000 square miles. According to Prof. Niphsr's report to the St. Louis Academy of Science, the region disturhed forms an ellipss, the major axis of which extends from Lsavenworth, Kansas, to Tuscaloosa, Ala., a distance of over 600 miles. The minor axis extends from nsar Clarksville, Ark., to a point midway between Cairo, Ill., and St. Louis, a distance of 300 miles. How far south the disturhance extended has not been determined with accuracy.

From Cairo to Memphis, along the Mississippi, ths action was most severe and heavy. Here the movement of the walls of huildings was plainly perceptihle, and the creaking of the joints of stroug frame houses distinctly heard. At Ironton the shock was less severe, though owners of hrick houses found some cause for alarm. Between Glasgow and Lexington, on the Missouri, the shock was intense enough to awaken many people, who thought that a heavy wind-storm was in progress The shock was first felt at Glasgow, at 11:23 P. M. (St. Louis time). It traveled rapidly along the axis of the ellipse, reaching Cairo at 11:48 and Msmphis at 11:50. Up ths river it gradually hecams less violent. It was perceptihle at Little Rock, Ark., though at Clarksville, 35 miles ahove, it had hecome too faint to be perceived.

THE WAY IT GOES.—In Joues county, Iowa, two farmers had a qnarrel ahout 14 fence rails, alleged to he worth $1.40. They hired two lawyers and went to law, hammer and tongs. After a long contest the plaintiff got a verdict of one cent, the cost to tho county was $60 and the lawycrs had pocketed $324. The farmers then elected the lawyers to the Legislature.

COAL oil has been discovered near Yreka.

Mining and Farming.

As this country is likely soon to rsceive a conciderable immigration from Europe, and there are already a good many msn in ths Eastsrn States out of employment, it may he well to say to these various classes of lahorers that the mining regions west of the Rocky Mountains are far from hsing crowded. To the right kind of men—ths hardy, resolutc and industrioue—thsre ars excellsnt chances for getting ahead in svery one of the Pacific States and Territoriee. It is rathsr a rough field, hut one full of good opportunities to those qualified tn maks them thoroughly available. As a pursuit, mining is not, like farming, one that can hs easily crowded, nor is it one that ie ever without a remunerative markst for its products. With gold and silvsr there occurs nsither glut nor dspreciation of price. "Mining," says the Auhurn *Argus*, "is the only field not yet in great part explored, the only one the product of which conflicts with the interest of no man, hut rathsr, as it makes tho world richsr, enhances the welfare of all the world." It is mining, certainly, that has chiefly given wealth and prominencs tn this coast. This industry is not now the mere hazard nf 30 years ago. It has become a sciencs among us, and we can predict with much certainty what the profit on the operations will he.

This fisld is limitless, and cvsry hlast that is tamped, every shovsl of gravsl that is lifted, aids ths farmer and the mechanic hundreds of miles away, for it opsns to them a market for their products and lahor.

In view of ths aid this industry affords all others, the Government should open cheap communication with the mines. Rich men everywhere should turn to them and make work for thoss who need it. Our Legislaturs should adopt a hroad, liheral policy with respect to our mines. Thsy must protect the capitalists from the people, and the people from the capitalists. The capitalists—for unless laws arc passsd freeing the miner from ruinous taxation and capricious intsrference capitalists will not invest tl.eir money sither for working old or for opening up new ground.

The lahorsrs otherwise will he ground down by the power and speculations of wealth. But recognizing all thess things, and also that it is through speculation, and not the actual working and devslopment of the mines, that money is lost as it has been in the Comstock and many other great mines, legislators will see that this is the most plausihle, if not the only solution of the social prohlem, and use their power toward making laws which will recognizs mining as the first industry of the State and coast; that with mining prospcrous, all other industries will flourish, and that in stimulating and accelerating the growth of mining they are indirectly contrihuting to thc welfare of svery department of business.

THE "Agricultural Report," just issued, gives the average pricè of the cotton crop for the whole country at 8¼ cents per pound. Value of the orop for 1878, $194,700,000. Average price of tohacco, 5, 6 and 10 cents per pound. Total crop for 1878, estimated at 393,000,000 pounds, worth $22,000,000.

"RED" FRANK WHEELER, a jovial, popular man, well known on the Comstock and throughout most of the mining camps in Nevada, is dead.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Steam Plowing Again.

EDITORS PRESS:—Ohserving a letter in the PRESS of February 1st, 1879, from a "suhscriber," in relation to steam plowing, I can inform him from a very extended experience that an engine for plowing, which would only weigh 2,500 pounds, would not he an economical machine, and would not do the work whicb he estimates. Our plowing traction eugiue weigbed near eleven tons, and iustead of sinking in land fit to plow, it plowed land nine inches deep and turned and run hack on the plowed land. On Haggin & Carr's ranch in Keru conuty, we plowed three acres an hour continuously for days in the sandy loam of that region. We used 12 12-inch plows in one gang, tearing np a width of 13 feet of new grounds, with one engineer, one fireman, and one plowman or man to look after the plows. OLIVER HYDE.

Vallejo, Cal., Feb.

The Cone-bearers, or Evergreen Trees of California.—No. 4.

[Written for the PRESS by J. G. LEMMON.]

Fir and Tamarack,

The last paper discussed the spruce family, closely allied to the fir, with which, as shown, it has often becn united or more or less confounded. But the distinctions are tbere given witb Dr. Eugelmann's *auf clarung* of the whole matter. It remaiue now for us to correct our vernacular and to apply the colloquial names to the proper trees.

Fir Family.

The firs have generally a very symmetrical, conical or fusiform outline, the limbs or whorls like immeuse fane, form borizontal strata in a diminishing series to the top. Timher soft and generally worthless. The cones borne by tbe uppermost limbs are upright, of numerous close-set scales and bracts, wbich fall away at maturity, leaving the core, or rachis, etanding. Leaves of lower limbs in two ranks; six species in California. Tbe geueric name, *Abies*, is a corruption of "apios," a pear.

1. *Abies sub-alpina*, Engel., variety, *fallax* Engel., the "*Picea amabilis*," prohably, of Douglas; the "Pumpkin Pine" of Oregon Cascades, and probably reaching down to California; trees 60 to 100 feet high; timher very soft; wortbless; bark thin, pale, smooth; cones elliptical, oblate, eix inches long; leaves glaucous-green, two inches long, notched on tbe lower eterile branches, pointed on the fertile.

2. *Abies nobilis*, Doug., "Red Silver fir" of tbe Shasta region. Stately trees 200 feet bigh; timber harder, valuable; bark thick, cinnamon brown or reddish; cones elliptical, oblate, six to eigbt iuches long; bracts protruding one inch and curved downward, clothiug tbe cone witb a beautiful mantle.

3. *Abies magnifica*, Murray, "Red Silver fir" of tbe Sierra; "*Picea amabilis*" of hotanists and collectors. This magnificent Queen of tbe Sierras, at altitudes of 7,000 to 10,000 feet generally attaine to 150 to 200 feet, witb a diameter of 5 to 8 feet; often mucb loftier and from 10 to 14 feet in diameter. Timber valuable; bark very thick, and reddisb witbin; cones elliptical, oblate, 6 to 8 inches long; bracts concealed; leaves all pointed, not twisted at base; striped beneatb witb four wbite silvery lines; hence the vernacular name of "Silver fir." The color of the bark wben cut gives it the name of "Red fir." Travelers aver tbat no fir on tbe globe exceeds this California species in magnificance and symmetry. One has but to visit a grove of these stately trees on bigh plateaus of the Sierra—notably near Webber lake—to receive impressions of majeety, grace and perfection that will eerve for mental enjoyment through life.

4. *Abies grandis*, Doug. "White Silver fir" of the northern coast region. A very tall tree, 200 to 300 feet high, but seldom over four feet in diameter. Timher, white, soft and coarse; bark, smooth and grayish; cones, cylindrical and two to four inches long; leaves, glossy green, marked beneath with two silvery lines, strongly grooved ahove and notcbed at apex, and one to two inches long.

5. *Abies concolor*, Engel. "White fir;" common on the Rocky mountains, from the bigher peaks of Mexico to Alaska, and throughout tbe Sierra at elevations of 3,000 to 7,000 feet. This etately tree yields only to *Abies magnifica* in etateliness and symmetry when young, and becomes still less striking in age. Timber less valuable, being softer and also scentless; is prized for butter boxes, meat barrels, etc.; hark, ashy gray outside, darker within and deeply fissured in old trees; cones, cylindrical and two to four inches long; leaves, longer than the preceding, two to three inches, twisted at base half way round and mostly blunt. Tbis species bas been generally mistaken for *Abies grandis*.

6. *Abies bracteata*, Doug. "Bracted fir" of a limited region on the Santa Lucia mountains in Monterey couuty. A little known tree, said to be "steeple-shaped, 100 to 120 feet high, with a diameter of two to four feet, unsurpassed in all the merits that the most appreciative could deeire." Coues, elliptical, oblate, three inches long, of few appressed, emooth, glaucous scales, between which protrude one to two inches of the mid-ribs of the hracts, curving upward so as to vail the cone from sight and reminding of teasel hurs; leaves, two inches long, flat, rigid, acute linear-lanceolate, of firm texture and twisted at hase half way round.

"Poor Amabilis."

This concludes the list of firs to he met with in California. It will be noticed that no species is here described nnder the Douglasian name of Amahilis. Alas, poor Amahilis! The "lovely fir" of Douglas has had a fearful tossing about for 45 years, and now is holdly dropped altogethcr, as being the best way to end the confusion caused by the paucity of the material gathered—only a few leaves and one cone (since lost)—by the venerable botanist and collector, David Douglas, wbo, after ecnding bis collections home, met witb a violent deatb on the Sandwich Islands.

There is still much uncertainty and discussion relative to tbe firs. The late visit of Hooker and Gray to California enabled these great masters to collect and compare much data, upon which they will soon report.

They now think that couuecting forms may show the union of *A. nobilis* and *A. magnifica* in one epecies, wbich must bear the name of *nobilis*, of wbicb *magnifica* would he tbe soutb-ern, sbort-bracted variety.

Tamarack Family.

The fourtb and last genus of the trihe *Abietinæ* is hut sparsely represented in California, barely reaching the northern limit from Oregon, where it is very abundant. Plainly distinguisbed hy its leaves, heing deciduous (falling annually), slender, short, and in fascicles of 2 to 20 on tbe ends of yearling branches. Two species in California. The scientific name *Larix* is an old Greek word applied to this tree, corrupted by the Euglish into "Larch." Cones small, depcuding.

1. *Larix accidentalis*, Nutt. "Western tamarack;" on tbe bigb plateaus of tbe Coast range of Oregon; often 250 feet high and five feet in diameter; frequently 200 feet to the lowest limhs; free to split and very strong and durable, beuce highly prized.

2. *Larix Lyallii*, Parle. "Lyall's larcb" of the Cascade mountains of Oregon; but little known.

This concludes the description of the four principal genera of the conifers, comprising the most of our California forcsts.

[To be Continucd.]

Boiler Incrustations.

[Written for the PRESS by R. GRIMSHAW.]

One of the principal tronbles in engiueering practice is tbe deposits of mineral incrustations on the walls of boilers. The matters forming tbese ecales are generally limey salts, such as carbonate or sulphate of lime, wbich are less soluble in hot water thau in cold. Thus water at 20° C. (68° F.) dissolves a little less than one-quarter per ceut. of its weigbt of sulphate of lime; wbile at 100° C. (212° F.) it takes up a little less than 5-23%; that is, 1-30% less than at 20° C. It results then that when water charged witb sulpbate of lime is heated from 20° to 200° C., it must deposit 1-30% of its weight of this salt; that is, one pound for every 3,000 pounds of water. If the water is not only beated to 100° C., but evaporated at 100° C., it must deposit all tbe lime it contains; that is, one-quarter of a pound of scale for eacb 100 pounds of water, or one pound for every 400 pounds of water.

Now as a square meter of heating surface evaporatee 20 kilograms of water per hour, and as tbe deposits are generally on the beating surface only, it follows tbat eacb square meter ought to have 1-20 kilog. per hour (or 18 kilog. per month) deposited on it, making a scale about 8 mm. thick.

It is useless to repeat bow much a stony lining 8 mm. thick will lessen the condnctive power of a plate and thus waste fuel, retard steaming and burn the ebeet.

This deposit of carhonate of lime is generally because this salt is only soluble in water containing carbonic acid gas. "Boiling ont" this gas causes tbe water to drop the carhonate.

Tbere are any number of processes to combat boiler incrustation. Most of them, declared infallible by tbeir inventors or discoverers, present beside their advantages so many objections that tbe remedy is frequently worse than the disease—as where tbe engines are ruined by foreign matter carried over by the steam, or the plates corroded by tbeir action. The details of the behavior of almost every substance tested, may be found in Van den Corput's memoirs, in vol. xxxi. of the *Bulletin du Musee de l'Industrie;* we ehall solely generalize bere.

Tbeir action is either mecbanical, physical or chemical. Tbose whicb act mechanically tend to cause the deposits to move so as not to adhere. Of these we may name pehbles, metallic halls, spun glass, etc., all proposed to be put in the bottom of the boiler. The glass is particularly dangerous as causing rapid wear of the engines after it is carried over hy the steam. Little fagots of wooden sticks are mucb safer, but unbappily they do not gatber mucb incrustation.

"Agitating" devices are of little use—the water in a boiler ie in a higb etate of agitation anybow, over the beating surface. Among materials acting physically are clay, potato etarch, wood sawdust and dye liquors; these act as *interposants*, enveloping tbe particles of earthy deposits, and preventing them from agglomerating in a hard mass; they can hence be readily blown off at the proper cocks. Of these, clay only increases the weight of the muddy deposits. Potato starch (ground potatoes) is better; throwing it in from time to time.

Another remarkahle interposant is a paint composed of graphite, tallow, powdered charcoal and tar, applied to the inner walls. The deposits will not etick to this; hut it has this objection, that it must be renewed every 15 days or so, and this takes a long time (sometimes two days) and thus necessitates stoppage of steam supply or the use of reserve boilers. Tbe same result is obtained by greasing the walls of the boiler; but tbis often causss foaming or else corrosion of the plates. Tar and mineral oils are best for this purpose.

The chemical agents proposed, as carhonate of soda, sal ammonia, alum, etc., transform the slightly eoluble salts into salts either soluble or completely insoluble, and depositing at once without adbesion. Tbe results obtained are neitber thorough nor constaut, while there is also to be feared corrosion of the sbeets by acids set free in these reactions.

Certain substances, as molasses, beer malt, beet pulp, etc, act physically as interposants, and also chemically by the sugar tbey contain, and wbich facilitates the eolubility of moet lime ealts. Most of these cause foaming in the boilers, fouling the gauge-glasses or gumming of the valves of the engine.

It is mucb best to precipitate tbe limey salts before the water is fed into the boiler. A very simple way is to have a large supply tank and to inject into the water it contains, a jet of steam which will cause it to deposit most of its limey compounds.

There is much needed a simple and inexpensive filter and precipitator, wbicb may serve at the samo time as a feed-heater.

Your Salt.

John Barton, of Alameda, is President of a salt manufacturing establishment at Mt. Eden, on San Francisco bay, 22 miles from San Francisco, whicb is locally known as tbe

Union Pacific Salt Works.

They were establisbcd some 11 years ago ou an island formed by the bay aud what are known as Eden and Union City crceks. This island comprises about 1,200 acres, aud is eutirely owned by the company. It is divided hy dykes into immense reservoirs, wbich are numhered, No. 1 heing ncarest the bay. Upon tbe termination of the winter rains, and as soon as the weather becomes settled, operations at the mauufactory commence. From 60 to 80 men are employed in the yards, they beiug uuder charge of a foreman, Mr. A. B. Winegar, who has occupied this position for 11 years, and is considered one of the most experienced and capable salt-makers in the United States. The

Reservoirs

Are put in thorough repair, levees overhauled, and everything put iu readiness, and sea-water is tben let into reservoir No. 1, through uumerous small gates. This reservoir is 300 acres in extent. When this "catch" bas remained in the reservoir from 20 days to four weeks, it is then discharged into rcservoir No. 2, 250 acres in extent, aud a fresh eupply let into No. 1. The first "catcb" is then, after remaining in No. 2 about tbe same length of time, transferred into No. 3, No. 2 being filled again from No. 1, and No. 1 from the ocean. In the same manner the brine is discbarged into reservoir No. 3, 100 acres in extent, whence it is emptied into the

Liming Ponds,

Nos. 4 and 5, where the lime is precipitated to the bottom. When the brine bas reached a strength of 17° (hydrometer) all tbe lime has crystallized at tbe bottom of the pond, and the liquid then begine to crystallize salt. This process of removiug the impurities is only practiced at theso works, and is one of the reasons of the superior quality of their salt. Iu hoiled salts, the rapid and unnatural method of crystallization forces the lime to settle witb the salt, and thus affects its purity. When the liquid is known to bave discharged its lime it is emptied into the numerous

Crystallizing Ponds,

As occasion may require. For the finer grades of salt these crystallizing ponds have wooden floors, and when the deposit is completed these floors are "raked," tbe salt in large crystals being scraped into heaps, shoveled into baskets, transferred on small hand cars to the edge of the yard, where it is dumped into huge pyramids, whence it is sacked and transferred to the company's mills on Sacramento etreet, where it is dried, ground into various grades, and finally prepared for the market. The salt, from the time its manufacture is commenced until it is delivered to the purchaser, is

Handled

Exclusively by the company. It is transported by their own schooners, bauled by tbeir own drays, put np in sacks of their own manufacture, and its hraud printed tbereon by their own printing press. This complete business arrangement is due to the sagacity of Mr. Barton, who has given the business his individual attention from the time he first became identified with it, some 16 years ago, until the present time, wben it stands without a rival in size and amount of business.

The works have a capacity of 20,000 tons per season, and tbeir average annual production is 12,000 tons.

For a description of the works we are indebted to tbe editor of the Alameda *Argus*.

How Money is Made from Copper in Yuba County.

It is a very simple process. Copper sulphuret is roasted to sulphate, leached and precipitated with iron. We are indehted for tbe following particulars to the Grass Valley *Union:*

The entire improvements made npon the Spenceville property have cost nearly $100,000, and as an evidence that the enterprise has heen profitahle is tbe fact tbat no assessments have hcen levied npon the stock for two years. The

Capacity

Of tbe works for the last six months bas averaged 25 tons of cement copper per month, which required tbe monthly nse of about 500 tons of ore. Tbe present product is 30 tons per month, and by next spring it will reach 60. The gross product of eacb ton of ore workcd is about $12.50, and net profit about $8.25 per ton. With the product of 60 tons of copper psr month, worth $15,000, the profit will be $10,000 at present prices of 17 cents per pound for the copper in the San Francisco market. The regular monthly expense account is between $6,000 and $7,000, and the number of employees is 12 men in the mine and 13 on the enrface.

Reduction.

The old ehed contains 12 leaching vats and the new one, standing directly below the new ore shed. will contain 20. The reduction works coutain four revolving cylinders, and two more are to be put up. A small engine furnishes all the power necessary to drive the machinery. From the hoisting works the ore hereafter will be conveyed to the top of the hill by a railroad, which is now in use. The cars are loaded from ore chutes, and drawu to the top of tbe bill by a stationary engine.

During the present season tbe company have made extensive

Additions

To their works to increase the capacity for production, and for economy and expedition in handling the ores. Tbe ore shed which has heen used until this time is 350 feet in length hy 60 feet in width.

It bolds 4,000 tons of ore arranged iu two lines of piles of 100 tons each. This has heen supplemented hy a uew shed, built on the top of the hill above the miue, whicb ie 500 feet long, and will contaiu 3,000 tons arrayed in piles in a singlo line. And it is intended further to extend this shed, and do away with usiug the old shed at the foot of the hill, because in manipulating the ores it is important to have all tbe other works below where the roasting is done, as everything has to work down hill, from the ore piles to the leacbing vats, tben to the receiving vat, and lastly to ths reduction works. Thc

Product Increases

From month to month without an increase of expense, for tbis reason: In working of the ores by tbe leaching process ouly ahout two-tbirds of the copper is ohtained, hut the waste pile is continually furnishing a large amount of solution that is utilized. The ground where the waste pile is accumulating is first covered with a sheeting of felting and asphaltum; the waste is there dumped aud water is freely thrown upon it witb bose; this percolates througb the pile, and it is caugbt in eluices and conveyed to the reduction works, where it is worked into copper. This waste pile will continue to increase from year to year, and will furnish one-third of all the product for the mere lahor of taking up the solution as it drains from tbe pile. Thus it will be seen that the waste pile is to be a permanent source of profit, and nonc of it goes to loss. During the last 12 months the production has not only met all expenses, hut has carried the improvements now approaching completion.

A GOLD MINING EXHIBITION.—William I. Marshall, a Montanian from Fitchhurg, Mass., lectured recently at the Cooper Union, N. Y., upon tbe "Yellowstone National Park," and in the course of the lecture, described the stats and process of gold mines and gold mining in America. Many who sougbt admission at the door were turned away. Upon the platform bebind the speaker, was a large screen, upon wbich views of mines and the mining conntry were shown by the magic lantern. On a etand on one side was a fac-simile of the 150-pound Australian gold nugget, which sold for $50,000. Mr. Marsball showed, by means of utensils whicb he had upon the stage, tbe manner of cradliug and washing with a pan whicb gold miners employ. Speakiug of the actual scarcity of gold, he said that the whole world's product of ages of time and acres and acres of mining, if melted down and run without alloy into a eolid mass, would not make a cuhe mcasuring 29 feet on a side, though the estimated value of all the gold coin, bullion and jewelry is $6,500,000,000.

FUEL FROM WASTE.—From the debris of the coal mines, France makes annually 700,000 tons of excellent fuel, and Belgium 500,000 tons. In England, where there is not so ninch waste in coal mining, and where coal is much cheaper, the manufacture of artificial fuel is only about 200,000 tons a year. Germany makes fuel, for the most part, from peat and similar eartbs.

SMOKE is not, as many persons imagine, lighter than air; it is, however, carried up hy the heatsd air, wbich being lighter than tbe surrounding atmosphere, is pressed upward. Smoke ascends because it is intermixed with vapors, gases and warm air.

Mechanical Progress.

Cold-Rolled Shafting.

An experience of many years proves more and more the importance of good shafting for the transmission of power. Whether gearing is attached to the same, as thus far has been the prevalent custom in England, or, what have been proved to be better, pulleys and belts, as has been the custom in the United States, and bid fair to be accepted all over the world—in any case, the shafting must be good, true, and strong, free from oscillation, flexion, or danger of breaking, twisting, or giving out in any manner; hence at the present day special attention is given to furnishing manufacturers with superior shafting, for which the demand has been continually increasing in proportion as mechanics have discovered its importance.

The best shafting is undoubtedly that which has been finished by cold rolling, by which the metal is condensed and its strength increased, while it becomes remarkably straight, true, and uniform in size; also, its surface represents a highly polished appearance.

The superiority of such shafting was shown by Major Wade, of the United States Ordnance Department, in 1860. He found by practical tests that bars of puddled and charcoal bloom iron, rolled hot in the process of manufacture, were increased in strength by the cold rolling, a process which at that time had been patented by Lauth. The results of the tests were as follows: Transverse strain for permanent set increase in strength, 162½%; torsional strain to produce permanent set, increase 130%; compressional strains to produce permanent act, increase 95%; ultimate strength under tension, increase 72%; hardness, increase 50%. Sir William Fairbairn found an increase of 50½%, comparing ordinary bars of a given size with similar bars reduced in size by cold rolling.

A similar series of trials made by the Franklin Institute of Philadelphia, showed an increase of ultimate strength for the cold-rolled shafting of 61% in tension, and 97% in compression. It is claimed that cold-rolled shafting has from 30% to 40% more effective strength than the same sizes of turned iron.

It is easy to comprehend the immense difference in effect when a shaft is finished by cutting the surface with a chisel on the lathe, or when, instead of this disintegrating operation, it is passed through rollers and the smooth and uniform surface is given to it by a powerful compression of the surface, and that in the latter case the density and strength must necessarily be much greater. If, incidentally, there is any porosity in the iron, the cutting on the lathe may lay it bare, while by cold rolling the pores will be closed up; it is, in short (to use common language), the difference in cutting away and squeezing together.

Cold-rolled shafting has begun to be generally appreciated; it is now used by locomotive and other engine builders, and by pump manufacturers, for piston-rods, pump-plungers, etc., without turning, except to make connections. It is also used to make pins for bridges. Cold-rolled iron is also used in preference to steel for the finger-bars and knife-backs of reapers and mowers, and for other special purposes.

Welding Fused Iron.

The difficulties which formerly stood in the way of the welding of iron obtained by fusion processes have been entirely overcome. Stated in broad and general terms, the welding power of iron rises and falls in the inverse ratio of its content of carbon; but the limits of its capacity for being welded are sooner reached than those of its malleability, and irons with a high content of carbon will not weld. The difficulty of welding diminishes in proportion to the ease with which fused iron can be obtained with a low content of carbon.

The question whether the metal obtained in the converter or the reverberatory furnace welds better has been carefully investigated, especially in Sweden. The conclusion has been arrived at that with a similar chemical composition, similar temperature, and similar working conditions, there is no difference. As a matter of practice, the rule is that the metal for heavy forgings is prepared in the reverberatory furnace, and that for lighter ones in the Bessemer converter. The process of dephosphorizing by oxides in the desilication gives the reverberatory furnace the preference at present, although the preference may not be a lasting one.

The uses of malleable iron have increased on the whole, owing to the more common employment of fusion-process irons, the freedom of which from cinder makes them more uniform in quality and trustworthy. Heavy pieces, many thousands of tons in weight, are no longer regarded as anything remarkable. The mechanical properties of the various irons made by fusion are so easily regulated to practical requirements, that there is no longer any limit to their use other than that set by cost. The extension given to the making of irons by fusion processes has also had the effect of raising metallurgy out of its former condition of empiricism, and demonstrating the necessity of scientific investigation. Ample proof of this was given at the late Paris exhibition. There was no well-ordered collection without its elaborately formulated analyses and tests, which for the most part showed a complete mastery of the scientific principles involved in them.—*Iron.*

Hints for Inventors.

The *Scientific American* calls the attention of inventive and practical men to the defects of locomotive boilers, and the advantages which might result from their improvements. It says: A locomotive boiler has three principal parts, all imperfect in greater or less degree. These are the fire-box, the tubes, and the smoke-box. The fire-box has rectangular walls, surrounded by water, except under the grate, and where the fire-door is placed. This is an arrangement necessitated by the requirements of science and not indicated by rules of utility or good construction. The flat form of the fire-box walls and of that part of the boiler which covers it, takes away from them strength of resistance, save what is given to each by the other by stays in immense number. Those must resist an enormous pressure, especially the roof of the fire-box, where it is not counteracted by any opposite pressure, and sometimes may amount to 200 tons.

This arrangement prevents proper cleaning of the outer walls of the fire-box and the inner walls of the boiler plates opposite. It is about the same thing where the tubes are; and these, rarely over two and one-half inches in diameter, are so numerous that it is as difficult to clean them exteriorly as it is to clean that portion of the boiler surrounding them.

The draft, urged by the jets of exhaust steam in the stack, is so strong that the air and gases in passing through the tubes at a high rate of speed drive with it a considerable quantity of fine dust, the residue of combustion of coke or other fuel; this dust scratches and cuts the tubes so as to necessitate their renewal. The dilatation and contraction of these tubes also cause leaks and repairs. The forced draft also costs dear in another way; because this steam jet creates a back pressure in the cylinders, frequently amounting to one-third the effective pressure. Further, the space left above the tubes and the smoke-box is so small as to reduce too much the proportion between the steam volume and the heating surface. It is also not unfrequent that the steam carries with it half its weight of water.

A Hand Loom Wanted.

The same journal says that there is a demand for a hand loom for amateurs' use. A correspondent writes: "We can get lathes and fret saws and printing presses and other machinery for the use of amateurs in abundance; but a compact, portable hand loom would be a novelty, of which it might, with some truth, be said that no house would be complete without it."

The number of people seeking industrial recreation is very large, and out of these a profitable clientage can be secured, no doubt, by whoever will offer them the novelty called for. It may pay some of our inventive readers to give the matter a little practical consideration.

Coating Metals with Platinum. — Mr. Dode, a Frenchman, has recently invented a process for covering iron with platinum. The iron is first coated with a preparation of lead and copper. It is then ready for the platinum composition, which is thus made: Ten parts of platinum are converted into chloride, mixed with five parts of ether, and permitted to evaporate in the open air. The residue is incorporated with a compound of 20 parts borate of lead, 11 parts of red lead, some oil of lavender, and 50 parts of amyle alcohol. Into this mixture the article to be coated is dipped, then allowed to dry in the air, and finally heated to a moderate temperature, in a muffle furnace. A practical demonstration of the *modus operandi* was recently given at the laboratory connected with the Mint and Bank of England, at which the ease and simplicity of the operation was fully seen and acknowledged; but as the invention is a recent one, the important element of time and wear to test his work is as yet wanting. The invention relates more particularly to the coating of articles of cast-iron, but is also applicable to the covering of other metals in order to preserve them from oxidation under the action of air, fire, or acid gases. The same process is applicable to glass. The processes hitherto known for the coating of metals have only imperfectly attained the object in view, inasmuch as the coverings of copper, nickel, silver, or tin, applied by immersion or with the aid of galvanism, are not adapted to prevent oxidation. Mr. Dode's invention consists in the application of platinum in such a state of division as to enable it to be employed as a preservative against the oxidation of metals, whereby a considerable saving is effected, as compared with the systems at present in use, and much greater efficiency is obtained.

Absorption of Carbonic Oxide by Living Organisms. — N. Grehant has experimented with mixtures of air and minute portions of carbonic oxide. He finds that a man or an animal, when compelled for half an hour to breathe an atmosphere containing only 1-779 of carbonic oxide, absorbs that gas in sufficient quantities to saturate about half the red globules of the blood, so that they become incapable of absorbing oxygen. In an atmosphere containing 1-1449 of carbonic oxide, about a quarter of the red globules are similarly saturated. These results are interesting and important in relation to physiology and hygiene.

Scientific Progress.

The Social Science Convention.

The annual meeting of the American Social Science Association was held in Boston, January 8th. The meeting was opened by the reading of a letter from the President, David A. Wells, explaining his absence and reviewing the progress and opportunities of social science. Never before in the history of the world have so many and so important questions—fiscal, economic, educational, sanitary, and moral—pressed themselves upon the attention of the public.

The steamship, the railroad, and the telegraph are breaking down the old and formidable barriers of nationalities, and, for the purpose of business, are making the whole world one country, a condition of things under which the great fundamental truth of modern political economy, that nations and individuals are alike benefited and never injured by the prosperity of their neighbors, will be more than ever manifested. All methods of production and exchanging are also undergoing modification, with the certain result, which no legislation can prevent, even if it were desirable that it should, of economizing labor and material, and the cheapening of production. During, and in consequence of these changes, and for years yet to come, there will be much of discomfort, and undoubtedly also of suffering, from the displacement of individuals from occupation and their readjustment in new positions or locations. Millions of capital now useful and returning an income to their possessors, are certain, in the no distant future, to be also made worthless, as the course of improvement requires that they shall be, in order that protection may be cheapened and made better. But the ultimate result will be undoubtedly greater abundance, less poverty, and a higher elevation of the race. To forecast the course of economic agencies and events; to help make the burden of disturbance and change in occupation less grievous to the people; to help overcome that moral inertia among the masses which greatly prevents them from helping themselves, and accomodating themselves with rapidity to the demands of progress, are all questions and problems pre-eminently within the domain of social science.

And if there is any advantage in associated efforts over individual and isolated effort, in the way of determining and disseminating truth, then, Mr. Wells concluded, the American Social Science Association has the largest of opportunities before it for future benefaction.

Much time was taken up in the reading of a paper by Mr. Geo. T. Angell, of Boston, which consisted of a tissue of extravagant assertions in regard to the adulterations of food, drinks, medicines, etc., entirely unsupported by facts or proofs of any kind. There is no doubt much done in the way of such adulterations; but the cause of honest dealing will never be advanced by reckless charges of misdoings on the part of traders generally, nor will such a course secure or sustain for the Social Science Association a reputation for a truly scientific spirit and character.

Archæological Researches.

A renewed interest seems to be awakened in the East for prosecuting excavations in various parts for archæological treasures. Favored by the authorities at Constantinople, Dr. Schliemann is again busily excavating at Troy; and Mr. Rassam has permission to dig anywhere in Mesopotamia. With such a comprehensive grant, districts will be opened that have not hitherto been searched, and we shall hear of fresh discoveries at Nineveh, of explorations in the long hidden ancient city of Assur, and of endeavors to find the famous royal "record office," or "Babylonian Bank," as some assyriologists call it, in which were stored a large collection of mercantile tablets, representing the monetary transactions of a firm trading in the name of Egibi & Sons. It is curious, says the *Scientific American*, to have bills for corn and fruits, and woven goods, and invoices and vouchers from the days of Nabupalassar and Artaxerxes in the form of baked clay; but they are to be seen at the British Museum. The Arabs and Jews from whom they were obtained have kept the secret so well that the place in which they were discovered is not yet known to Europeans.

Kutha, now a group of great mounds, was the sacred university city of Babylonia, and had an extensive library, which is frequently referred to in mythological tablets discovered in other parts of the kingdom. It was from that storehouse of learning that the tablets giving an account of the creation were originally taken; and it is hoped that discoveries of other documents not less interesting will there be made.

In the mound of Nebhi-Yunus, search will be made for the palace of Sennacherib, in the expectation that some records of the latter years of that monarch may be found, "and possibly some accounts, however meager, of the second campaign against Hezekiah."

But besides all this, Mr. Rassam will make explorations in the country of that ancient people, often mentioned in scripture—the Hittites. The existence of mounds along the bank of the Euphrates has long been known; and under a certain group known as the mounds of Jerabolus, it is supposed that Carchemish, the Hittite capital, lies hidden. Inscriptions in an unknown character were found in that neighborhood a few years ago; and it is hoped that some key thereto may be met with in the course of the excavations now to be undertaken, and furnish to scholars the link wanting to connect Assyria with Western Asia. As the firman granted to Mr. Rassam extends over a number of years, we may trust that the interesting enterprise will be carried to a successful issue.

The Voltaic Pencil.

There is at the present time scarcely a single branch of industry to which electricity is not lending its aid. Art, however, has thus far received but little benefit from this source, if we expect the application of electricity to electro-metallurgy. An important discovery, however, has just been made in Paris, by M. Bellet, whose invention consists of a voltaic pencil, by the use of which designers and draughtsman may be enabled to dispense entirely with the aid of the engraver. The editors of *Electricite* state that they have examined beautiful proofs of lithographs and etchings obtained, without the use of the engraver, by the effect of a voltaic arc produced at the point of an ordinary lead pencil. Encouraged by this success the inventor has taken out patents in various countries, and a company has been formed to carry out the process, which will soon be placed before the public. At present there are being prepared models of a series of apparatus which will allow any artist, however ignorant of the mysteries of electricity, to reproduce immediately, and without the aid of any artisan, the most delicate and complicated drawings; and this, too, by a very simple process and at a very moderate price. By a slight modification of the system there may be produced: 1. Stencils analogous to those produced by the Edison pen; 2. lithographs; 3. etchings; 4. stereotypes for typographical work. The initiators of this discovery are confident that an entire revolution will take place in the process of illustrating papers by means of their electrography. Either copper or zinc plates may be used. A late number of *Nature* describes the *modus operandi* as follows: A thin sheet of paper is attached to the plate. One of the poles of a Rhumkorff machine is connected to the plate, and the other pole to the top of the pen. The electricity then runs through, making a spark which perforates the paper in whatever direction the artist directs the pen. As soon as the drawing is finished, the paper is rubbed over with greasy ink, laid on with an ordinary roller. The paper is removed, and the plate is dipped into the acid, which cuts away those portions not protected by the ink. The light of the spark is said to be sufficient for the artist, even when he works in a dark room; and the pen is stated to be as manageable as an ordinary pencil.

Evolution and Spontaneous Generation.

Rev. W. H. Dalinger, who is well-known through his combat against the theory of spontaneous generation, lately delivered a lecture in London on the relations between his theory and that of the evolutionists. According to the report in *Iron*, there were, he said, many admirers of the theory of evolution who held that unless spontaneous generation was admitted, the theory was incomplete. Just as in water there is the potentiality of forming crystalline patterns in snow and ice, so they hold that in organic matter generally, there is potentiality of forming protoplasm. No living structure contains any known element that is not met with in the inorganic world, and the only chemical difference known is the combination of the elements. But the lecturer urged that evolution and spontaneous generation were two distinct questions that need very accurate study apart. The developmental progression of all living forms from simple protoplasm, is a very different question from whether living protoplasm can be spontaneously evolved from the inorganic world. For himself, if facts were brought forward to support spontaneous generation, he should be bound, were they valid facts, to accept the theory. He had, however, devoted much labor, and the time of years to the rigid investigation of some of the facts that bear upon the question, and these he would describe. It had seemed to him, in studying what had been written, that there were two lines of work that needed following out very closely. One was a series of thermal experiments, to determine with exactness what is the "death point" of an organism, or a "germ." The other was to watch the life history of some forms of monads and see if they did reproduce. It was this second line he had taken up. The most carefully conducted experiments of the first groups have led to the conclusion that if all germs are excluded from septic liquids no life appears, while his experiments had conclusively shown that monads do reproduce from parental products, and the life history of successive generations had been watched. The natural inference seems to be that monads originate only from previously existing monads, and if this is true of them, it is not improbable that observations conducted with equal care will show the same with regard to bacteria.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 23.		Week Ending Jan. 30.		Week Ending Feb. 6.		Week Ending Feb. 13.	
Alpha	15	12½	15⅝	14	18½	15	21	19
Alta	8½	7¼	8⅜	7¾	8⅜	7¾	8½	7⅝
Andes	60c	45c	50c	45c	50c	....	80c	50c
Alps	....	....	....	....	....	....	....	....
Argenta	60c	80c	70c	60c	65c	60c	70c	55c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1½	1½	1⅛	1.20	1½	1¼	1½	1
Belcher	5⅞	4.40	6	4¾	6⅞	5⅞	8⅜	6½
Belmont	60c	50c	70c	55c	80c	70c	50c	45c
Best & Belcher	22¾	21½	22	21¼	24¼	21½	26	24
Bullion	9	7¼	8½	7⅞	8½	7⅞	9	8¼
Bechtel	1	75c	75c	....	75c	....	80c	50c
Belle Isle	20c	....	20c	15c	....	....	20c	....
Bodie	9	7¾	8	7½	8	7⅜	8⅞	7½
Benton	4.90	4½	6¼	4¾	5⅜	5	6	5¼
Bulwer	15	14	14¾	14½	15	14½	18	16
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	70c	75c	....	75c	60c	65c	60c
Belvidere	70c	50c	50c	....	55c	50c	45c	25c
Booker	30c	25c	40c	30c	40c	20c	45c	40c
Caledonia	3.20	3	3	2.80	2.95	2½	3½	3
California	9⅜	9¼	9⅝	9⅜	9⅜	7⅝	8	7¾
Challenge	3.05	2½	3.10	2⅝	4.30	2.95	5¼	4
Chollar-Potosi	50½	47	48½	46	49	46¼	49¾	48
Comanche	....	....	....	....	....	....	....	....
Confidence	17	14½	17¼	15¾	20	15½	23	17¾
Con Imperial	1.15	95c	1.10	1.05	1.20	1.05	1.35	1.20
Con Virginia	8⅜	7⅝	8½	7	8⅜	7⅜	8	7½
Crown Point	6	5	5⅞	5¼	6¼	5½	6⅞	5⅞
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	50c	....
DeFrees	15c	5c	10c	5c	10c	....	15c	10c
Dancy	....	....	....	....	....	....	....	....
Day	30c	20c	25c	20c	30c	20c	40c	30c
Eureka Con	29	26	27½	26¼	29	27	30¾	29¾
Exchequer	6⅜	5⅜	6⅜	5⅞	6½	5⅞	7¼	6¾
Endowment	30c	25c	25c	15c	15c	10c	25c	10c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	6⅜	3.90	4½	4.05	4½	4⅛	6	4.60
Gila	20c	15c	5c	....	....	....	5c	....
Golden Chariot	....	....	25c	....	....	....	....	....
Golden Terra	....	....	6	....	5½	5⅜	5½	....
Goodshaw	35c	30c	30c	25c	35c	30c	45c	25c
Gould & Curry	14⅞	13¼	14½	12¾	14½	12⅞	15¼	14½
Hale & Norcross	18⅞	16½	18¼	16¼	19	15¾	21¼	18¼
Hillside	....	....	2	1.95	2½	2	2½	2⅛
Highbridge	1.80	1.55	1.65	1½	1.85	1¼	1.40	1¼
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	....	20c	15c	15c	10c	15c	10c
Independence	1¾	1.40	1.80	1½	1.65	1½	1.80	1½
Julia	4½	3.45	3.90	3½	4.05	3¼	4½	4¼
Justice	4¼	4	4½	4	4	3.80	5⅝	4
Jackson	7½	7	7½	7	7½	7	7	6½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	8	5½	6⅜	5½	7⅜	5⅞	8	6¼
Kossuth	20c	15c	40c	20c	25c	20c	25c	10c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	75c	60c	75c	60c	1.30	70c	2	1.20
Lady Wash	1½	1	2½	1¼	2	1½	2½	1.80
Leopard	70c	30c	50c	25c	85c	15c	90c	85c
Leviathan	1	55c	70c	45c	75c	60c	75c	50c
Leeds	1.10	1	1	....	60c	....	80c	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	60c	50c	50c	....	....	....
Modoc	60c	50c	60c	50c	....	....	....	....
Manhattan	3⅞	3½	3.60	3¼	3.60	3¼	3¼	3
Martin White	5⅝	5	5	4¾	5¼	5	6½	5½
McClinton	50c	25c	60c	35c	60c	45c	60c	....
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	34¾	32½	38¾	34½	37½	36	40½	37¼
Mides	1½	....	....	....	....	....	....	....
Morning Star	3¾	3	3¼	....	3	....	3	2⅞
North Con Virginia	7½	5½	7½	6	9½	7	11½	8⅝
New York	75c	70c	1	65c	1.10	70c	1.10	85c
Northern Belle	7	6	7	6½	8	5⅞	8½	7¾
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	35c	25c	35c	20c	20c	....
Occidental	1	50c	1	60c	1	....	....	....
Ophir	35½	33½	35½	33½	34½	33¼	42	34½
Oriental	50c	....	50c	....	50c	35c	50c	40c
Overman	12½	10⅜	11	10½	10⅞	10¼	12	11¾
Panther	....	....	....	....	10c	5c	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	45c	25c	50c	35c	40c	30c	35c	25c
Prospect	....	....	....	....	5c	....	....	....
Raymond & Ely	7	5¾	8	6¾	6	6½	8	6
Richer	75c	....	50c	....	75c	....	60c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	1½	90c	....	....
Savage	16	14	14¾	13⅛	15⅝	13¼	17	15½
Seg Belcher	23	20	22	....	....	....	24½	23
Sierra Nevada	49¼	44	49½	46¾	48	46	49	46½
Silver Hill	2.40	1.70	2.30	2	2½	1.90	2.90	2½
Silver King	....	....	7	....	10	....	19	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	1½	50	1½	75c	1½	1.05	1½	1
Summit	2¼	1½	2	1½	2	1⅜	2¼	1.95
Scorpion	1⅜	1¼	1.45	1	1.80	1½	1½	1.60
Solid Silver	1	70c	65c	50c	70c	60c	70c	65c
South Bodie	25c	20c	25c	....	25c	....	25c	....
South Standard	....	....	....	....	....	....	....	....
Star	80c	....	60c	....	65c	50c	95c	75c
St. Louis	55c	40c	70c	55c	55c	50c	50c	....
Syndicate	85c	....	....	....	2	....	....	....
Tioga Con	1.70	1½	1½	1.30	1½	1½	1.78	1½
Tiptop	1.20	1	1.20	....	1½	85c	1.45	1
Trojan	50c	40c	45c	40c	45c	35c	45c	35c
Union Con	60½	50	63	59	56¾	57	62	61
Utah	18¾	16½	19¼	17½	18¾	17½	19½	17¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	95c	75c	85c	75c	85c	70c	1.30	85c
Wells-Fargo	20c	15c	20c	15c	20c	15c	20c	15c
Woodville	50c	35c	....	....	40c	25c	30c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	22¾	19	21	19½	25½	19½	27½	21¾

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 7.

280 Alta....7¾
190 Alpha....21@20¾
210 Best & Belcher....24
2245 Bullion....9@8¾
300 Baltimore Con....1½
1186 Belcher....6¾@7
270 Benton....5¼@5⅜
245 Con Virginia....7⅝@7¾
720 California....7¾@8
865 Crown Point....6½@6¼
2895 Con Imperial....1.35
1255 Caledonia....3½@3.30
90 Con Dorado....65c
450 Confidence....23@22¾
1495 Challenge....5@5¼
75 Chollar....49½@49
860 Dardanelles....4½@4.15
2975 Exchequer....7@6¾
600 Flowery....40@35c
1015 Gould & Curry....14½@14¾
50 Geo Douglas....50c
185 Hale & Nor....18¾@18½
1110 Justice....4.20@4.30
1290 Julia....4.30@4.20
505 Kentuck....8@7¾
100 Kossuth....25c
325 Lady Wash....2@1.90
700 Lady Bryan....1.20@1¼
360 Leviathan....65@70c
250 Mexican....37¼@37½
55 Morning Star....3@2¼
1220 North Con Vir....9@9¾
855 N Bonanza....1.60@1½
600 New York....95c@1
395 Overman....12@11¾
225 Ophir....34½@34¾
660 Phil Sheridan....30c
20 Seg Belcher....23@24½
120 Sierra Nevada....48¾@49
305 Savage....15½@15⅝
710 Silver Hill....2.55@2½
1255 Solid Silver....70c
60 St Louis....50c
1300 Succor....1.10@1
350 Scorpion....1¾@1.60
400 Santiago....90
425 Trojan....35@40c
140 Union Con....62@61
145 Utah....18½
200 Wells-Fargo....20c
1120 Ward....85@90c
1025 Yellow Jacket....27½@27

AFTERNOON SESSION.

3000 Argenta....55@70c
300 Albion....40c
120 Bechtel....50@55c
340 Bodie....8@8½
50 Belmont....45c
100 Black Hawk....65c
650 Booker....40c
330 Belvidere....25c
120 Bulwer....16
70 C Pacific....1½
200 Coso Con....5c
600 Caledonia (B H)....1
100 Dudley....80c
750 Day....40@35c
650 DeFrees....10c
130 Eureka Con....30
900 Endowment....15c
2000 Fourth of July....20c
520 Golden Terra....5½
550 Goodshaw....25@30c
300 Grand Prize....4¾@4.60
500 Gila....5c
100 Hussey....15c
10 Hamburg....75c
145 Highbridge....1½@1.30
420 Independence....1.55@1½
20 Jackson....7
150 Leopard....85c
255 Leeds....65@50c
100 M White....5¾
100 McClinton....60c
220 Mono....1½@1.40
400 Navajo....20c
170 Northern Belle....8@7¾
170 Paradise....2¼
195 Raymond & Ely....7@8
50 Richer....60c
200 Real del Monte....3
100 Star....75c
550 Summit....2
130 S Bulwer....60c
210 Tiptop....1
290 Tioga Con....1½
100 University....75c

Saturday A. M., Feb. 8.

845 Alpha....21@20½
260 Alta....8@7⅞
230 Andes....55c
1400 Albion....30c
670 Argenta....70c
310 Best & Belcher....24½@25
1680 Bullion....9@8⅞
1355 Belcher....6½@6⅞
300 Booker....40c
320 Bodie....8⅜@8½
165 Benton....5½
150 Bulwer....16@16½
320 Baltimore Con....1½@1.30
150 Belvidere....45c
480 Belmont....50c
480 Con Virginia....7¾@7⅞
115 California....7¾@8
1245 Confidence....19@20½
150 Chollar....49½@49⅝
945 Crown Point....6½@6⅜
2755 Con Imperial....1½@1.30
1355 Challenge....4.60@4.40
500 Caledonia....3¼@3.30
200 Caledonia (B H)....1
150 C Pacific....1.40@1½
540 Dardanelles....4¼
100 Dudley....80c
650 Day....40c
350 DeFrees....10c
980 Exchequer....7@7¼
45 Eureka Con....30¾@30
800 Endowment....10c
100 Flowery....35c
650 Gould & Curry....15@14¾
280 Grand Prize....4¾@5
175 Golden Terra....5½
196 Goodshaw....30c
205 H & Norcross....19¾@19⅝
100 Hillside....2¼
100 Highbridge....1.30
1250 Justice....4@4.20
2100 Julia....4½@4.40
530 Jackson....7
475 Kentuck....7¼@7¾
500 Leviathan....70@66c
2760 L Bryan....1¾@1.80
220 Leopard....85c
435 Lady Wash....2@1.80
505 Mexican....39@39⅝
150 Mono....2
50 McClinton....60c
1115 N Con Virginia....11@10⅞
150 New York....1@1.05
1845 N Bonanza....1½@1.60
200 N Sierra Nevada....10c
100 Northern Belle....7¾
590 Ophir....38@38⅜
275 Overman....12@11½
1460 Phil Sheridan....35@25c
255 Paradise....2¼
310 Raymond & E....6½@6
100 Real del Monte....3
440 Savage....16½@16
2000 Succor....1
215 Sierra Nevada....40½@40¼
1235 Silver Hill....2½@2.60
540 Solid Silver....70@65c
230 Scorpion....1¾@1½
190 S Bulwer....60@55c
550 South Bodie....25c
50 Summit....1.95
295 Scorpion....1⅜
80 Star....70c
650 Trojan....40c
200 Tiptop....1.45
150 Tioga....1½
190 Union Con....61½
220 Utah....19@19½
200 Woodville....40@45c
2895 Ward....90c@1
100 Wells-Fargo....20c
1440 Yellow Jacket....25¼@25

Monday A. M., Feb. 10.

330 Alta....8
180 Alpha....20½@20¾
560 Andes....60@80c
250 Best & Belcher....25¾@25¼
35 Baltimore Con....1.30
665 Belcher....6¾@6⅞
1425 Bullion....9@8⅞
390 Benton....5⅜@5½
160 Chollar....51@50½
825 California....7¾@8
445 Con Virginia....7¼@8
750 Crown Point....6@6⅛
3095 Con Imperial....1.30
1130 Challenge....4½@4.60
300 Caledonia....3.40@3⅜
775 Confidence....19¾@21
100 C Dorado....50c
400 Dardanelles....4¼
990 Exchequer....7¼@7⅛
300 Flowery....35c
185 Gould & Curry....15
560 Hale & Nor....20@21¼
565 Justice....5¼@5⅛
1310 Julia....4½@4.45
60 Kentuck....7
1085 Lady Bryan....1.80@1⅞
300 Leviathan....60@50c
100 Lady Wash....1.90
645 Mexican....40½@40
695 North Con Vir....11@11½
1050 N Bonanza....1.80@2
675 New York....95c@1
50 Ophir....42½
70 Overman....12
370 Phil Sheridan....30c
100 Plutus....1.55
1820 Solid Silver....60@75c
685 Savage....16@17
230 Sierra Nevada....48½@49
520 Silver Hill....2⅝@2.70
1185 Succor....1½@1.05
25 Seg Belcher....24½
340 Scorpion....1⅝
900 Trojan....45c
50 Utah....17⅞
155 Union Con....61½
500 Wells-Fargo....20c
680 Ward....1.30@1¼
1635 Yellow Jacket....24½@24

AFTERNOON SESSION.

855 Argenta....70c
810 Bodie....8⅞@8½
90 Bechtel....55@75c
230 Booker....45c
300 Belvidere....50c
390 Bulwer....17@18
100 Black Hawk....60c
100 Con Pacific....1½
50 Day....35c
220 Dudley....80c
350 DeFrees....10c
110 Eureka Con....29⅞@30
400 Endowment....20c
545 Grand Prize....5@6
300 Goodshaw....40c
795 Golden Terra....5¼
400 Hussey....15c
150 Hamburg....75c
150 Hillside....2½@2¼
1420 Highbridge....1.40@1.30
300 Independence....1⅝@1.70
340 Jackson....6⅞@6½
200 Leeds....80c
445 Leopard....90@85c
120 Martin White....6½
10 Manhattan....3¼
520 Mono....2
100 McClinton....60c
275 Northern Belle....8@8¼
400 Navajo....20c
90 Oriental....40@50c
1400 Paradise....2¾@2
430 Ray'd & Ely....6¼@6½
250 Star....75@95c
60 S Bodie....25c
100 S Bulwer....60c
670 Summit....1.95@2
30 Silver King....19
220 Tioga Con....1½
200 Tiptop....1¼
500 Tuscarora....5c

Tuesday A. M., Feb. 11.

345 Alpha....19@19½
1600 Alta....8½@8
400 Andes....70@75c
535 Best & Belcher....26@25¾
610 Belcher....7¾@7¼
690 Bullion....8¾@8⅝
1550 Benton....6@5⅞
1060 Baltimore Con....1½@1
706 California....7¾@8
225 Caledonia....3½@3.20
720 Con Virginia....7¾@8
4370 Con Imperial....1¾@1.30
40 Chollar....49½
730 Crown Point....5¾@6
385 Confidence....19½@18½
490 Challenge....4¼@4
300 Con Dorado....45c
125 Dardanelles....4½@4.60
1680 Exchequer....7¼@7⅛
200 Flowery....40c
625 Gould & Curry....15¼@15½
100 Geo Douglas....50c
295 H & Norcross....18⅜@18¾
1440 Justice....5⅜@5⅛
1200 Julia....4.40@4.30
340 Kentuck....6½@6¼
2900 Lady Bryan....2@1.80
405 Lady Wash....2½@2.05
1830 Leviathan....70@75c
345 Mexican....39@38⅞
1725 New York....1.05@1.10
1510 North Con Vir....9½@8½
2220 N Bonanza....2.15@1.95
595 Ophir....40@39½
160 Overman....11⅞
750 Phil Sheridan....30c
300 Plutus....1.60
15 Seg Belcher....23
270 Sierra Nevada....48@47¾
685 Savage....15⅜@15⅝
640 Silver Hill....2⅞@2.90
2370 Succor....1¼@1.15
315 Scorpion....1.60@1.70
610 Solid Silver....70c
200 Trojan....45c
75 Utah....18½@19
400 Union Con....62@61½
650 Wells-Fargo....20c
2135 Ward....1.20@1.30
2010 Yellow Jacket....24@23½

AFTERNOON SESSION.

1150 Argenta....75@70c
250 Albion....50c
100 Belle Isle....20c
605 Bodie....8⅞@8½
500 Booker....40c
200 Bechtel....75c
80 Belvidere....50c
150 Bulwer....17¾@18
50 C Pacific....1½
1400 Caledonia (B H)....1@1.20
200 Dudley....80@75c
950 DeFrees....10@15c
60 Day....30c
1150 Endowment....20@25c
105 Eureka Con....30
1500 Fourth July....25c
150 Goodshaw....40c
2325 Grand Prize....5¾@6
150 Gila....5c
40 Golden Terra....5¼
200 Hussey....10c
1915 Highbridge....1.40@1½
50 Hillside....2¼
375 Jackson....6½@7
100 Leopard....85c
645 Mono....2@1.90
150 McClinton....60c
20 Martin White....6¼
20 Manhattan....3¼
80 Northern Belle....8¼
350 Navajo....20c
800 Paradise....2@2.20
500 Raymond & Ely....6½@7
650 Richer....60c
1188 S Bodie....25c
300 Star....90c
840 Summit....2@2¼
500 S Bulwer....60@65c
50 Tioga Con....1.60
2500 Tuscarora....5c
1275 Tiptop....1.05@1

Wed'sday A. M., Feb. 12.

550 Andes....70@65c
340 Alpha....19½@19¾
610 Alta....8@7¾
630 B & Belcher....25½@25¼
2095 Bullion....8½@8⅜
480 Belcher....7
750 Benton....5¼@6
10 Chollar....49
630 Con Virginia....7¾@7⅞
240 California....8@7⅞
490 Crown Point....6@6½
410 Caledonia....3
4235 Con Imperial....1¾@1.20
475 Confidence....19@18¼
1170 Challenge....4@4.15
190 C Dorado....60@65c
465 Dardanelles....4¾@4.70
1795 Exchequer....7@6⅞
25 Flowery....35c
440 Gould & Curry....15½@15⅜
295 Hale & Nor....19¾@19¼
330 Justice....5¼@5⅜
1100 Julia....4.30@4.20
170 Kentuck....6¼
1100 Leviathan....75@60c
1130 Lady Bryan....1.90@2
180 Lady Wash....2
580 Mexican....39
460 North Con Vir....9¾@9½
430 New York....95c@1
455 N Bonanza....1.90
225 Overman....11¾
515 Ophir....39½@39¾
150 Plutus....1½
450 Phil Sheridan....30c
1025 Succor....1.05@1
620 Savage....16.55@16
245 S Nevada....48@47¾
120 Scorpion....1.60@1.65
750 Solid Silver....70c
195 Silver Hill....2.80@2.85
1470 Trojan....40@35c
40 Utah....18
35 Union....61½@61¾
1280 Ward....1.20@1¼
25 Woodville....30c
940 Yellow Jacket....22½@23

AFTERNOON SESSION.

750 Albion....50c
2500 Argenta....75@65c
210 Bulwer....17⅞@17¾
250 Bechtel....80@75c
1060 Bodie....7¾@7½
300 Belvidere....65@70c
1000 Belle Isle....20c
400 Booker....40c
400 C Pacific....1½
50 Dudley....90c
380 Day....40c
385 Eureka Con....30
400 Endowment....20c
1200 Fourth July....25c
430 Gila....5c
810 Grand Prize....5¾@5½
460 Goodshaw....45@40c
1000 Golden Terra....5½
1890 Highbridge....1.40@1¼
100 Hussey....15c
875 Independence....1.70@1.80
405 Jackson....7
55 Leopard....90c
105 Leeds....60@65c
25 M White....5½
20 Manhattan....3
365 Mono....2
270 Northern Belle....8¼@8½
345 Navajo....20c
60 Oriental....40c
600 Paradise....2.05@2
100 Real del Monte....3⅜
300 Raymond & Ely....7
50 Richer....60c
200 Star....80c
525 Summit....2.20@2¼
420 S Bodie....25c
260 S Bulwer....60c
125 Tiptop....1¼@1.20
5300 Tuscarora....5c
100 Tioga Con....1.78

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora T & M Co	California	2	20	Dec 7	Jan 10	Feb 15	C V D Hubbard	312 California st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	2	20	Dec 7	Jan 20	Feb 20	C V D Hubbard	312 California st
Best & Belcher M Co	Washoo	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Feb 21	J J Scoville	59 Nevada Block
Mayhelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Feb 15	H A Whiting	211 Sansome st
Mono G M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance M Co	California	2	50	Dec 19	Jan 28	Feb 21	B Lengley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Feb 25	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Catawha M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Cherokee Flat Blue Grav Co	California	40	05	Dec 20	Jan 28	Feb 18	R N Van Brunt	318 Pine st
Day S M Co	Nevada	3	05	Feb 6	Mar 16	April 8	J W Pew	310 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Mar 13	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N O Walton	324 Pine st
Mariposa Land & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McClinton M Co	California	2	25	Dec 24	Jan 28	Feb 18	W H Lent	327 Pine st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	Safe Deposit Build
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 24	J Penteeost	611 California st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Mar 24	S F Monroe	419 California st
Pleiades G & S M Co	Nevada	2	05	Dec 21	Jan 24	Feb 18	W L Oliver	328 Montgomery st
S F Petroleum Co	California	6	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	Mar 1	April 5	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Glasgow S M Co	Nevada	Jno Crockett	203 Bush st	Annual	Feb 25
Mansfield G M Co	California	J M Buffington	309 California st	Annual	Feb 18
Pinal M & M Co	Arizona	Amos Roberts	214 Sansome st	Special	Feb 19
Silver Lick Con M Co		Alfred K Durbrow	309 Montgomery st	Special	Feb 17
Trojan M Co	Nevada	David Wilder	328 Montgomery st	Annual	Feb 21
William Penn M Co		O J Humphrey	328 Montgomery st	Annual	Feb 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	3 00	Dec 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Feb 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Feb. 6.

10 Alta....7¾
105 Alpha....18½@18¾
180 Andes....50c
350 Best & Belcher....23@23¾
960 Bullion....8⅞@8¾
500 Belcher....6@6¼
265 Benton....5@5⅛
315 Caledonia....2.85@2.95
7155 Con Imperial....1.20
100 C Dorado....60c
1980 California....7⅞@7¾
130 Challenge....4.10@4.30
720 Con Virginia....7¾@7⅞
760 Confidence....19¾@20
105 Chollar....49
425 Crown Point....5⅞@6
1640 Dardanelles....4@4.05
1270 Exchequer....6⅜@6½
1250 Flowery....35c
705 Gould & Curry....13⅝@13⅞
100 Geo Douglas....50c
745 Hale & Nor....18@18¼
365 Justice....4@3.95
1641 Julia....4@4.05
320 Kentuck....7½@7⅝
200 Kossuth....25c
245 Lady Wash....1.95@2
275 L Bryan....1.15@1.20
450 Leviathan....75c
245 Mexican....36½@37
100 Morning Star....3
680 New York....90@95c
265 N Con Virginia....8¾@9½
750 N Bonanza....1.70@1.85
130 Ophir....34¼@34½
210 Overman....10½@10⅞
635 Phil Sheridan....30@40c
300 Peytona....1
100 Plutus....1.40
145 Sierra Nevada....46@46½
840 Savage....14⅞@15½
300 Silver Hill....2.45
1600 Succor....1
570 Scorpion....1⅜
700 Solid Silver....70c
840 Santiago....1.80
150 Wells-Fargo....15c
870 Ward....85@90c
225 Woodville....40c
610 Yellow Jacket....24⅞@25¼

AFTERNOON SESSION.

700 Argenta....60c
100 Albion....30c
600 Belmont....40c
610 Belvidere....50c
250 Bodie....8
50 Bechtel....60c
50 Booker....40c
150 Caledonia (B H)....95c
200 Dudley....1
710 Day....30c
245 Eureka Con....29@30½
820 Grand Prize....4.60@4½
375 Goodshaw....30c
600 Hussey....15@20c
500 Highbridge....1½@1.70
200 Hillside....1.90
330 Jackson....7
100 Leeds....75c
200 Leopard....85@90c
200 Martin White....5½@5⅝
335 Mono....1½
290 Northern Belle....8
3200 Navajo....10@20c
485 Paradise....2¼
150 Raymond & Ely....5@5½
625 Summit....1.90
300 Star....75c
100 S Bodie....25c
670 S Bulwer....55@60c
400 Tiptop....1
225 Tioga Con....1½

Thursd'y A. M., Feb. 13.

170 Alta....7¾@7⅝
75 Andes....50@25c
115 Best & Belcher....25@25½
2235 Belcher....7¾@8
2250 Bullion....8¼@8⅜
270 Benton....5⅝@5½
240 California....7@7¾
385 Con Virginia....7⅝@7½
1590 Crown Point....6⅝@6¼
80 Chollar....48½@48
3975 Con Imperial....1.20@1¼
325 Confidence....18@17¾
535 Caledonia....3@3.15
1290 Challenge....4@4.10
100 Dayton....50c
545 Dardenelles....5@4.90
1930 Exchequer....6⅝@6⅞
2650 Flowery....45@50c
215 Gould & Curry....15@14¾
200 Geo Douglas....60c
165 Hale & Nor....18¾@18⅞
30 Justice....5⅝
630 Julia....4¼
155 Kentuck....6½@6¾
30 Kossuth....10c
250 Lady Wash....1.90@1.95
740 Lady Bryan....1¾@1.80
930 Leviathan....70@60c
90 Mexican....39@38⅞
100 Mackey....2.65
300 New York....85c
430 North Con Vir....9½@9¼
590 N Bonanza....2@1.90
150 Ophir....39
580 Overman....11¾@12
930 Phil Sheridan....30c
220 Sierra Nevada....48@47¾
220 Savage....15⅞@15⅝
2710 Succor....1
460 Silver Hill....2.80@2¾
307 Scorpion....1.65@1.60
1000 Solid Silver....70@65c
100 Trojan....40c
165 Union Con....61½@61½
1100 Wells-Fargo....15c
435 Ward....1½
1505 Yellow Jacket....22½@21¾

AFTERNOON SESSION.

800 Argenta....65c
650 Albion....50c
30 Bulwer....16½
380 Bodie....7⅞@7½
250 Bechtel....60c
225 Belmont....45@40c
410 Booker....40@45c
50 C Pacific....1½
2450 Caledonia (B H)....1¼@1.30
100 Dudley....90c
450 DeFrees....10c
100 Day....40c
80 Eureka Con....29¾@30
525 Endowment....20c
500 Fourth July....30c
1100 Gila....5c
125 Goodshaw....40@59c
810 Grand Prize....4¼@4⅛
50 Hussey....10c
10 Hamburg....70c
150 Highbridge....1¼
330 Hillside....2¼
1255 Independence....1.90@1.95
390 Jackson....7@7⅜
100 Leeds....75c
105 Martin White....5½
800 Mono....2
345 Manhattan....2½@2¾
350 McClinton....50c
150 Minnietta Bell....10c
300 Navajo....20@25c
60 Northern Belle....8⅜@8¼
1050 Paradise....2@2.10
165 Real Del Monte....4
300 Raymond & Ely....6¼@6½
85 Silver King....9
200 S Bulwer....60c
50 S Bodie....70c
350 Summit....2.[illegible]10
1440 Tuscarora....5c
895 Tioga Con....1.60@1.80
105 Tiptop....1.10@1.20

Pacific Board—Latest Sales.

Wed'sday A. M., Feb. 12.

10 Alpha....19½
10 Alta....8½
160 Belcher....6⅞@6.95
95 Best & Belcher....25½@25¼
400 Bullion....8½@8⅜
130 Con Virginia....7¾@7.80
145 Con Imperial....1.20@1½
20 Chollar....49
10 Crown Point....6
200 California....7⅞
20 Challenge....4.10
70 Caledonia....3.05
370 Exchequer....7
310 Gould & Curry....15⅜@15½
50 Hale & Nor....19½@19¾
200 Justice....5½@5.45
480 Julia....4¼
110 Mexican....39½@39
90 Ophir....39½@39¼
20 Overman....11¾
10 Savage....16
10 Sierra Nevada....47¾
280 Silver Hill....2.95@2.80
60 Union Con....60½
80 Utah....18@18½
90 Yellow Jacket....22¾

AFTERNOON SESSION.

100 Alta....8
130 Andes....65c
60 Black Hawk....62½c
150 Bullion....8½
80 Belcher....7¼
20 Best & Belcher....25½
30 Benton....5⅞@6
25 Bodie....7⅞@8
340 Con Imperial....1.20@1¼
50 Caledonia....3.05
30 Con Virginia....7¾
10 California....7¾
50 Challenge....4¼
20 Crown Point....6¼
100 Endowment....22c
150 Exchequer....6½@6⅜
200 Geo Douglas....60c
50 Grand Prize....5¾
10 Hale & Nor....19
100 Highbridge....1½
130 Justice....5½
50 Julia....4.30@4¼
20 Kentuck....6@6¼
100 L Bryan....2¼
20 Lady Wash....2
10 North Con Vir....9¼
50 N Bonanza....2
100 New York....95c
20 Ophir....38¾@39¾
130 Phil Sheridan....30@28c
215 Plutus....2.65
70 Raymond & Ely....6¾
300 Rock Island....25c
285 Succor....1@1.10
340 Santiago....2.20
320 Silver Hill....2.90@2¾
400 Solid Silver....60c
250 Trojan....37½@35c
150 Ward....1¼
200 Wells-Fargo....20c
140 Yellow Jacket....22⅜@22¼

California Board—Latest Sales.

Wed'sday A. M., Feb. 12.

50 Alpha....20@20½
85 Alta....8@8½
150 Alpine....60c
900 Ætna....9@12c
150 Andes....67½@65c
30 Best & Belcher....25¼
40 Belcher....7
20 Bullion....8¾
40 California....8
30 Con Virginia....8
340 Con Imperial....1.22½@1¼
70 Crown Point....6@5½
135 Challenge....3.95@4
40 Chollar....49½
75 Caledonia....3@3¼
100 C Dorado....65c
50 Dayton....40c
65 Exchequer....6⅞@7
100 Favorite....65c
70 Gould & Curry....15@16¼
200 G Deposit....75c
200 Globe....2c
65 Hale & Norcross....19½@19¾
65 Justice....5⅜@5½
135 Julia....4.30@4.20
100 Leviathan....67½c
50 Mexican....39
25 Mackey....5½
100 N Union....40c
200 Newark....20c
150 New York....95@97½c
60 Ophir....38⅞
30 Savage....16

120 Silver Hill.....2.85@2.90	100 Favorite.............65c
20 Sierra Nevada.........48	60 Gould & Curry...15¼@15½
1100 Twin Peaks...........5c	100 G Deposit............85c
400 Trojan..............42½c	45 Hale & Nor...........19½
35 Union Con.............61	50 Hillside...............2¼
2000 U Flag...............1c	50 Julia..........4.40@4.35
120 Ward...............1.20	100 Leviathan............65c
30 Yellow Jacket.........23	200 Mint..................16c
AFTERNOON SESSION.	2000 Monumental............4c
30 Alpha..................20	40 Mexican..............39½
40 Alta....................8	100 N Sierra Nevada.......8c
220 Andes.........50@60c	45 N Con Vir..............9½
100 Almaden Q.............1¼	150 New York.......95@97½c
500 Ætna..................11c	40 Ophir..................39½
60 Bullion...........8¼@8½	40 Overman...............11¼
50 Best & Belcher....26@25¼	100 Phil Sheridan.........30c
45 Belcher.................7¾	40 Savage...........16½@16
40 Con Virginia............7¾	50 Senator...............35c
40 Crown Point.......6¼@6½	40 Sierra Nevada.........48
275 Con Imperial...1¼@1.22½	300 Santiago.........2.20@2¼
500 Coso Con...............5c	200 Tiger............65@67½c
30 California..............7¼	200 Trojan...............42c
110 Challenge........4.20@4¼	400 Twin Peaks............5c
100 C Dorado.............55c	30 Utah..................18¼
100 Endowment............30c	1000 U Flag...............1c
250 Enterprise..............1	120 Ward..................1¼
50 Exchequer.........7@7.05	100 Wales...................1
	45 Yellow Jacket....23¼@23½

Mining Share Market.

The past week has been more exciting and active than any for eome time heretofore. The expected, upward tendeucy noted in our last issue, has been partially realized ; a eharp advance all along the line of the Cometocks having been experienced.

The amicable eettlement between the Comstock companiee and the Sutro Tunnel company, inaugurated this move for the better, and though no important ore bodies have been struck, the new lease of life, which this arrangement gives to the minee, the utility of the tunnel as a meane of drainage and better ventilation, and the certainty that in conjunction with it, new deep exploratione can be made in entirely virgin ground, eufficed to croate the strong upward impetus above noticed.

Even the upward movement in Yellow Jacket last week gave way to the interest elsewhere awakened along the Comstock. The principal movement on the north wae in Ophir and Mexican. Among the water stocke, Savage and Hale & Norcroes were the center of interest. Later, the leading etocks of Bodie and other outside districts became active, showing that more intereet is being taken in them as the spring advances. The latter part of the week ehowed less confidence and pricee were lower. Outsiders did not appear to appreciate the services rendered them hy manipulators in advancing "securities" to a higher standard, refusing to be accomodated even at previous prices. At the cloee of the week, pricee eomewhat recovered, and after a eteady etand, are again somewhat on the increase. No eharp rally is looked for, but more confidence is expressed in the general gradual riee, than would have been in case of a eudden spurt. In passing its February dividend, California has caueed eome dieappointment, it having been generally supposed that the now reduced rates could have been kept up eomewhat longer. Thie extinguiehee the last of the dividend-paying mines on the Cometock—takee away its "neet-egg," as it were. Meantime the Bodie, Eureka and other dividend-paying mines continue to dieburee their ueual amount of net earnings, and the productive minee everywhere to ehip their nsual complement of hullion, indicating an active and healthful condition of thie indu8try.

Throughoat the California mines, more especially in the bydraulic washiugs, great activity ie noticeable eince the advent of the recent heavy rains, whereby the reservoire bave been filled and the ditches eupplied to overflowing. The year now promisee to be a moderately good one witb every class of placer mines.

Bullion Shipments.

Since our last iseue, we have noticed the following bullion sbipments:

Highbridge, Feb. 7th, $10,027.35; California, Feb. 5th, $129,817.88; Bodie, Feb. 7th, $9,400; Hilleide, Feb. 5th, $5,370; Hillside, Feh. 9th, $5,200; Standard, Feb. 6th, $19,917.38; Northern Belle, Feb. 6th, $3,972.35; Alexander, Feb. 11th, $3,693.64; Tybo Con., Feb. 7th, $4,407.60; Leopard, Feb. 9th, $6,800; Independence; Feb. 10th, $4,000; Grand Prize, Feb. 10th, $12,500; Hilleide, Feb. 11th, $5,150; Indian Queen, Feb. 3d, $3,780.45; Northern Belle, Feb. 8th, $6,076.47.

METEOROLOGY.—Our knowledge concerning rainfall at different pointe on the Pacific coast is bcing constantly added to, and the etudy is generally associated with some intereeting condition of phyeical geography, or physical ecience, having a general and a wider bearing. Investigatione of thie sort are certainly practical enough ; though there is often at first glance, as in other departments of science, little hut abetract ecience to be seen on the eurface. Mr. Purnell concludes his eeries of articlee ou "Coemic Meteorology" in this iesue. The original obeervations of Dr. Blake, Prof. Le Conte and eeveral others, beforo the Academy of Sciencee, and ite eections, are to the point.

THE vote of Texas hae increased 50,000 in two yeare, wbich indicatee an increase of population in that time of hetween 300,000 and 400,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—*Ledger*, Feb. 8: In the 230 and 270 levels of the Bunker miue the rock continuee as good ae ever. A steam pump has been put into the 270 level to throw the water up to the 70-foot drain tunucl. Another body of ore has been fouud in the 350 level, which it ie expected will turn out well. In the bottom level, 450 fect, the ledge bes been fouud eix feet in thickness and gradually getting larger. The mill is kept running all the time and pays woll. The Con. Amador made a mouthly cleau-up Suuday. Only one-half the milling capacity, or 20 stamps, was kept in operation. The yield was in tbe neighborhood of $10,000—a great shrinkage from the output of gold in its prietine days. The old worke are closed, with little prospect of their ever becoming the eccne of activity again. It doce not follow, however, that the miue is exhaueted. The mill is kept runniug to its full capacity on rock from the Wolverine tunnel and Badger shaft. At the Talisman mine, near Amador City, thinge are looking more hopeful than for many monthe past. In drifting north, towards the Keystoue, a body of quartz of fair quality has been etruck. The mill hae been operating on this rock for a couple of weeke. Water was turned into the More diteb Tuesday, and the new 10-stamp mill was etarted Thureday. All the works conuected with thie mine are of the most eubstantial character.

CALAVERAS.

UPPER COUNTRY MINING JOTS.—*Chronicle*, Feb. 8: The work of sinking the shaft in the Champion mine at West Point is progressing rapidly. It is now down 490 feet—the deepest ehaft in the county east of the Gwin mine. The mille in connection with the mine are in constant operation, the ore cruehed being first grade. The ehaft in the San Pedro, at Mosquito, is down 100 feet and deepening as fast as the bottom can be knocked out of it.

GWIN MINE.—The volume of water encountered iu the Gwiu mine continues eo large that it has heen found necessary to put in a larger pump from the 1500 level up to the first etation above. The work is now heing done, operations at the mine not being interfered with in consequence, however. All the hatteries are buey and will be kept so. Rock hae lately been etruck in the 1500 level, the ledge ehowing from eix to eight feet in width and the ore being of fair quality.

EL DORADO.

THE MINES.—*Republican*, Feb. 6: The El Dorado canal is frozen, keeping in check the claims dependent on it for water, the Park canal company sending down eufficient water to supply the demand aside from the Tenneseee claim. The Utah mine at Newtown ie also supplied from the latter canal, and the mill hae been running about two weeks. Ou the North-eide the Gold Depoeit was etarted up last Monday, the new concentratore having been put in place.

MINING ABOUT KELSEY.—*Mountain Democrat*, Feb. 8: We etill receive bighly encouraging reporte from tbe Gold Depoeit mine. The grading for tbe new concentrator bas been completed, and the work of putting the machinery together has commenced. The mill was started up for a test last Monday. Ore is being taken from the lower level, whicb carriee a large percentage of eulpburete of the fineet cbaracter. In that level the ore body remains firm and givee promiee of cheering reeulte, botb ae to quantity and quality. Work ie being proeecuted on the Esperanza mine, whicb is situated about one mile nortb of Johntown and within the great gold-bearing helt of that eection. The ore hody in the Esperanza is from two and a half to four feet in widtb, and proepecte well. A tunnel ie being run to tap it at a depth of about 100 feet. The Manefield hae been relocated under the suggeetive title of tbe "Cinche" mine.

INYO.

NEW FINDS.—*Independent*, Jan. 25: Fine gold quartz discoveriee have heen made near the foot of the lake, and there ie some excitement in relation to the matter. Quite a number of persons from Cerro Gordo and the hille around, have rushed off to some re-diecovered minee of Saline valley, eome 25 miles from Cerro Gordo. A new dietrict is being organized there called Mineral King.

THE ECLIPSE.—The Eclipse mill is running 15 etampe on gold ore when tbe weatber permits. Superintendent Eudey ie fitting up a five-stamp battery to run on silver ore, and a new amalgamating pan and a separate reeervoir for tailings.

MONO.

WEEKLY MINING REVIEW.—Bodie *Standard*, Feb. 8 : The work of developing our mines ie being advanced with gratifying rapidity, and each week's report improves the record upon which we ehall demand the attention of the world to this district the coming epring. Already, upon the strengtb of the mild weather which we have enjoyed thue far during the winter, quite an immigration of etrangere has commenced to eet in, anxious to he on hand in good eeaeon to participate in the lively times whicb everybody believes to he in the near future. During the past week the Standard, Bodie and Bulwer mines have been visited by partics of exteuded experience in miues, who express what would seem almoet exaggerated confidence in the vastness of the wealth as yet uuextracted from their deptbs. The probability of finding the Standard veins continuing in the Tioga at the north are eo great as to render it almost a certainty. Tbe prospects of opening out a vein in the Blackhawk, uow that a shaft is beiug eunk on the eouth end of that company, are first-class. The "lightning drift," 300 level of the Dudley miue, has not yet cut the Dudley ledge, but it muet reach it in a few days. We have heard pretty well authenticated rumors of a strike of some importance iu the Maybelle mine, eaid to be of base ore, whicb assays $100 per ton in silver. The Red Cloud is crosecutting west on its 400 level, and great thinge are anticipated of the Packard and Morton vein, which will be cut 150 feet below the point of discovery on the 250 level. The Noonday is looking very nicely, and the Richer is said to be taking out eome very rich ore.

ABOUT BENTON.—Inyo *Independent*, Feb. 1 : The mines around Beuton give more promises than pay. The Neal mine ie developing, aleo, the Sultan Hill. The Indian district contains fine proepects. The croppings there aeeaying from $30 to $65. Capital ie all thie country wants to make it a flouriehing section. The Clover minee are extensive and rich ; wood and water being handy, they can be cheaply worked. The Indian Queen ie giving great eatisfaction. A new company will etart up the old Comanche works. Many other claime present goed proepects.

NEVADA.

WATT GRAVEL MINE.—Grase Valley *Union*, Feb. 9: The main east drift is in 1225 feet; the lava has been passed and gravel found on the bedrock again; the bedrock is of a eoft blue elate. The north prospect drift hae been run 60 feet, the bedrock is elate. There is no change in the gravel and all work below the main drift has been etopped.

PITTSBURG.—Of thie mine, situated in the Nevada dietrict, the Superintendent's letter of the 1st inst. saye: The lode in the 600-foot drifte preeente well, it being well defined, carrying rich eulphurets. The etopee at 700-foot also preeent favorably, yielding large quantitice of good ore. The 800-foot etopes are being worked and yielding well. The lode at the 800-foot ie large and producing large quantities of ore. The mill is runniug well and doing good work.

IDAHO.—*Foothill Tidings*: On accoant of the loes of time by reaeon of ice in the ditch, the bullion yield last montb was only $39,500, but the usual monthly dividend of $7.50 per ehare, amounting to $23,250, was declared on Monday, payable immediately. This makee the 114th regular dividend paid by the compauy, amounting in all to $2,600,750, out of a total yield of the mine of $5,302,204.

ITEMS.—*Transcript*, Feb. 8: The Manzanita gravel mine near this city continues to be worked a part of the time, altbough the supply of water is light. There ie at preeent running in the main ditch of the South Yuba Canal Company about 3,000 inchee of water. There has heen a slight increase in the bead during the past few days, owing to the warm weather thawing out the emall etreams that lead into Soutb Yuba river and Deer creek.

PLACER.

VARIOUS CAMPS.—*Herald*, Feb. 8: Messrs. Lerman and Stuart, wbo have been engaged for eome time past in ruuning an incline in their drift claim, near Grizzly Flat, have struck a fine proepect, whicb they think ie eufficient inducement for them to run a tunnel of 700 feet on a grade eufficient to work their ground. August Hazelroth has aleo struck a good prospect in his drift claim adjoining the Rough & Ready. This will assure that company in prosecuting work in their claim with vigor and eatiefaction. But little water in the ditchee at preeent, and bueineee ratber dull. On Saturday laet tbe Orion Co., at Dutch Flat, diecharged a blast in their claim of 175 kegs of powder. The result was an admirable euccess.

PLUMAS.

GIBSONVILLE. — Plumas *National*, Feb. 1: The Bootjack mine ie turning out good pay, and a uugget weighing $81, was picked up in their dump a few daye ago. The Michigan ie showing good pay dirt, and Mr. Lowell thinke he has got the old lead ae good as ever. During the rain the company waehed np about a third of the dump-pile, dirt that wae not expected to pay but little, and they were agreeably eurprised by a clean-up of $1,300. The North American company is running two tunnele, and have good prospects. The mines in the Gibsonville neighborhood eeem to be holding their own and the epring will probably be a lively one.

SAN LUIS OBISPO.

LA PANZA DISTRICT.—*South Coast*, Feb. 5: On our arrival at La Panza dietrict we fouud eome 200 men actively employed, four-fifths of whom are native Californians—eome men digging, eome men packiug pay dirt to water, some rocking, eome panning, many walking over the country proepecting; all eanguine, all concurring in the wish for more rain. The main encampment ie in La Panza canyon, in which, and ite tributaries, ravinee and gulchee, is done all the present mining; prospects of fine gold are found nearly everywhere in the water courees; coarse gold is found in the ravinee and gulcbes. The great ecarcity of water at preeent in thie locality, and the lack of skilled lahor, is the cauee of the placere not yielding larger amounts to tbe operators. Evidencee are that "pockets," or rich deposits of gold, exist in the lower hills and flats which wash into the ravinee and gulches which are tribntary to the La Panza. The find in the preeent workings is indicative of what ought to exist in other parts of the dietrict which is more favored, having a large area of water-shed and an immenee depoeit of cement gravel. The belt of cement gravel has a length of six milee (the dietance explored and proepected by me) and a width of two miles. The topography of the country to the south and east on the line of the cement gravel showe it to be much broken. Tbe belt laye in a deep basin or channel; tbe cement gravel has the color and character of the gravel belt of Forest Hill and Yankee Jim, in Placer Co., of You Bet and Little York, in Nevada Co., of Moute Christo, in Sierra Co., and varioue hydraulic banks in Yuba Co., although the water shed ie larger in area; there never ie water enough to work by the hydraulic procese.

SHASTA.

COPPER CITY MINING ITEMS.—Reading *Independent*, Feb. 8: The continued fine weather for the past week has rendered it favorable for mining companice to pureue their workinge without interruption, and well have they improved the opportunity. The Extra company have their tramway completed and are now carrying from Bully hill to the company'e mill about 40 tons of ore per day, which is being reduced at eaid mill with ite ueual good reeults. This company have just completed their new emelting furnace and will make a teet of ite workinge to-day, and as there are many thoueand tons of good copper ore in this dietrict, which will pay well if succesefully worked by thie procees. We are all waiting anxiously the reeult of the emeltere to-day. Ae there are two other companies who have endlese quantitiee of good emelting ore, it will make times very lively in thie place the coming epriug, ee there will doubtlese be a number of these furnaces erected. The Potter mine ehows better ae they sink deeper, opening up a wonderful body of rich ore. The tunnels in the Northern Light and Winthrop minee are being puehed forward as faet as poseible.

SIERRA.

HOWLAND FLAT. — Dowuieville *Messenger*, Feb. 8 : When "The Empire" stopped work, about 40 white men were eent adrift. Some have gone to Foreet City to work in the celebrated "Bald Mountain," some to Gibeonville, and neighboring towne. We all hope the Bonanza company will eoon be in with their tunnel, for it will then be in their power to call the miners back and reetore the lively times. The Empire paid well every month. The Bonanza will probably do the eame. If it paye well, how much better it would be for the people of the town, and aleo the Bonanza company, if the latter would employ white men only. That *would* "make things lively." Not ouly that; look at the example eet for othor companiee. The Buttes Quartz Co. ie working about 100 men but the preeent etorm will prohably enable them to put on a full force.

TUOLUMNE.

VALUABLE MINE.—*Independent*, Feb. 8: The Basin Slope mine, located ahout eight milee weet of Cherokee in thie county, ehowe immeuse bodies of ricb galena sulphureted ore, assaying from $200 to $350 per ton. The mine is the property of Meeere. Lewis Broe.

THE MELONES MINE.—The immenee reduction works at Melonee mine, near Robineon's Ferry, are nearly if not quite complete, and many will await with considerable intereet the reeult of the venture. The machinery is, eo to epeak, incomprebeneibly grand and intricate to the eye of a tyro in mechanism ; in fact, the daze of helting, ehafting and pulleys ie like unto a drunken man'e dream. But if it worke up to echedule it will be a grand thing. A great portion of the machinery was brought from Boston. Ae the procese has proved eucceeeful in reducing the tellurium oree of Arizona, it is confidently expected to operate ae well upon the rich but rehellioue matter of the Careon Hill mines. It ie a hig thing, and bae coet a mint of money.

YOLO.

CALIFORNIA QUICKSILVER MINE.—Yolo *Mail*, Feb. 6 : R. G. Hart aesietant Superiutendent of the California Quicksilver mine, made ue a call yeeterday. He reports the mine doing much better than for a year past, but the company only running a forec of 30 hands ae minere. They are running two furnacee conetantly—one for the reduction of fiue ore, and one for coaree ore. With quicksilver at 39 cents per pound, the mines yielded sufficient during the month of January to produce $3,000 over and above all expenses, including the per cent. paid for sale of quicksilver. This is a pretty good ehowing for eo emall a force of workmen.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA.—Gold Hill *News*, Feb. 12: To-day the southeast drift on the 1700 level will reach a point directly under the North Con. Virginia ehaft. As soon as the neceseary arrangements are completed, an upraise to connect with the bottom of the shaft will he commenced. When this connection is completed, the ventilation of the mine will be the hest possihle down to the 1700 level. Work is heing puehed vigoronsly at all points.

CALIFORNIA.—The north drift, on the 2150 level, running to connect with the eouth drift on the 2000 level of the Ophir, is now in 120 feet, the face in very hard hlasting gronnd. In the drift south from the Ophir, on the 2000

Continued on page 108.

What the English think of our State Pride.

A correspondent of the London *Times* has been in this country, and touches off our State pride in this manner.

The rivalry which prevails among all the States of the American Union is especially keen and conepicuoue in Minnesota. Each State, from rugged Maine to sunny Florida, and from imperial New York to golden California, conceiders that no other one rivals or excels it. The citizens of each speak as if they had been placed by a kind Providence on the most favored spot of the whole earth, and they regard the stranger who doubts whether their good fortune be wholly exceptional as a person who ie utterly ignorant and inexcusably prejudiced. Indeed, a new comer will ingratiate himself the moet easily with the citizens of a particular State if he can look upon all others, for the time being, through their spectaclee. His wisest course will be to copy the example of the Frenchman ridiculed and stigmatized by the late Gen. Sir Charles Napier. That renowned soldier and eccentric man entertained the conviction that all Frenchmen are hypocrites, and he illuetrated this harsh and ungeneroue opinion by saying, "If a Frenchman were to go to hell, he would put on an overcoat, compliment the Devil on the fineness of the climate, and add that, if anything, it was rather chilly." I once eaid eomething to a Penneylvanian, alike laudatory and merited, with regard to hie State. He accepted the compliment as a matter of couree,- and replied, "That'eso; Pennsylvnia is best in everything." Traveling in Colorado shortly after the late total eclipse of the sun, I remarked, in the preeence of eeveral citizens, it was fortunate that the weather had been eo favorable there for the purpoee of observation. One of them told me, in reply, "Sir, Colorado can beat the world in eclipses, as in everything elee."

These instances might be multiplied. They all exhibit that pride in one's State, which is as notable a characteristic of a United States citizen as pride in hie country. When Capt. Basil Hall traveled in North America he bitterly complained of the pertinacity with which everyone demanded hie opinion about it, and of the extreme annoyance which was manifested if the reply was not unreservedly complimentary. It is far less common now than in bygone days for a etranger to be questioned concerning his views of the Republic as a whole, and to be expected to draw a flattering comparison between it and what the ignorant call the effete monarchies of Europe. It ie far more probable that he will be aeked by the citizene of one State what he thinks of another, and then, unless he dieplay a little of that French politeness which Sir Charlee Napier detested, be will give ae much offence as Capt. Basil Hall gave when he denied that the United States was the only land worth living in.

Cosmic Meteorology.—No. 4.

[Written for the PRESS by SAMUEL PURNELL.]

As to the cause of eun-spote a curious theory was broached many years ago, and recently it has been pretty well confirmed, to the effect that they are caused by the orbital approach and recession of the planets. Just how they cause eun-spots when in perihelion, producing a maximum when conjoined, cannot be said, but the coincidence in the time of their joint peribelia and the maximum of spots is undoubted. Prof. Loomis has advocated the theory of a long cycle of 56 yeare, as related to the eucceseive conjunctione of Saturn and Jupiter. This is not as distinctly marked ae the 11-yeare cycle. Prof. Wolf has aleo discovered several minor periods of solar activity. By projecting his reeults in a continuous curve, he found in it a series of small undulations succeeding each other at an average interval of 7.65 months, or 233 daye. This is nearly the mean interval between the successive conjunctions of Venus and Jupiter, which is 236.992 days. The close agreement of theee periods leaves little room to doubt that the latter is the true period. Prof. Wolf hae also detected a period of variation corresponding to the sun's time of rotation, with respect to the earth, or ahout 27 days. It has also been found that the eun-spot cycle is nearly equal to 18 periods of Venus, to 35 synodal periode of Mercury, to one period of Jupiter, aud to several other planetary conjunctions.

The Kew Professors, Messrs. Stewart, de la Rue, and Loewy have recently examined this subject anew, and have traced out the relation between certain poeitions of the planets and the amonut of eun-spote during a cycle, ehowing that the principal planets, Mercury, Venus, Earth, and Jupiter, in their approach and withdrawal from the suu, do have much, if not a controlling, influence upon the spote. It will be seen that the astronomical theory as to the cause of the spots ie very complicated, and demands great labor to establish or disprove it. It has been thought that each planet in coming to and going from perihelion, more especially about the time of the equinoxes, produces a violent action upon the eun, and hae a eympathetic action produced within itself; and that when eeveral planete happen to be coming to or going from perhelion at the same time, aud are in or nearly in the same line with the sun, being nearly in the same plane, the combined action producee a maximum of sun-epots. According to Prof. Stewart, the planetary periods at times of maximum sun-epote are found to be greater than the average value.

Ae it is my intention to publish further investigations in future into the queetion of the relation of the movements of the planets to the spote, thie branch of the eubject ie herewith ahruptly cloeed; merely remarking that thie eolar, planetary, and phenomenal connection ie etartling, in that it eeeme to indicate a revival of

Astrology

On purely scientific grounds, for eince great phyeical terrestrial motione can be affected by the position of the planets, it ie natural to aek why may not human life be aleo affected, favorahly or unfavorably, as it can hardly be a matter of indifference to mankind what ie tbe potency of the governing forcee of the earth.

Having already etated euch general matters concerning eun-epots as are of common interest, an effort will now be made to eee how closely their periodicity may coincide with any periodicity in the

California Rainfall.

In thie a difficulty of great moment is immediately encountered, in the fact that not sufficient time has elapsed whereby true cycle averages can he obtained; neither have there been enough oontinuous obeervers, nor the rainfall of enough statione noted whereby an average preeipitation throughout the State can be safely deduced. In view of these almost fatal difficulties it can hardly be expected that the eurprising yearly variations of rainfall here can be brought within any rule, yet with all these dieadvantagee it will be eeen later on, that in many cases there is a curious agreement of the rainfall with the eun-epot curve, and in other caeee an equally curious disagreement; and I must confese, at present, I know not of any process by which to harmonize the results.

The meaeured rainfall of four California stations from 1849-50 to 1877-78; that is, from the summer of one year to the eummer of another (there being but an ineignificant rainfall during the summer), was as follows:

YEAR.	San Francisco.	Stockton.	Sacramento.	San Diego.	Mean.
1848-49	15.99	7.99	11.00	7.99	19.99
1849-50	33.10	39.00	36.99	6.27	27.84
1850-51	7.40	4.71	4.71	7.25	6.02
1851-52	18.44	17.93	17.98	19.95	16.34
1852-53	35.26	27.49	36.37	8.61	20.91
1853-54	23.87	21.94	20.07	11.33	19.98
1854-55	23.68	11.68	18.62	12.99	16.73
1855-56	21.66	8.37	13.77	19.79	13.62
1856-57	19.81	11.33	19.44	7.66	12.32
1857-58	21.88	18.99	15.99	8.68	16.14
1858-59	22.22	19.94	16.94	12.19	16.61
1859-60	31.22	22.72	22.63	6.85	29.85
1869-61	19.72	15.55	16.09	5.92	14.24
1861-62	49.27	35.55	35.55	11.39	32.92
1802-63	13.62	11.58	11.58	5.92	19.67
1803-64	19.98	7.86	7.87	7.26	8.27
1864-65	24.73	22.51	22.51	8.27	19.59
1865-66	22.93	17.92	17.92	13.51	18.97
1866-97	34.92	25.31	25.31	18.29	25.93
1867-68	38.84	29.71	32.77	13.42	26.44
1868-69	21.35	16.35	16.64	11.91	16.56
1869-79	19.31	7.63	13.57	9.49	11.72
1870-71	14.19	9.73	8.47	7.67	9.24
1871-72	34.71	20.80	22.40	6.22	21.93
1872-73	18.02	13.39	13.50	8.20	13.25
1873-74	23.98	15.20	23.99	15.10	19.32
1874-75	18.49	11.14	17.89	6.19	13.36
1875-76	29.01	18.33	25.09	9.93	19.89
1876-77	19.99	7.93	9.25	3.63	7.43
1877-78	32.15	18.00	22.55	19.19	22.29
1878-79					

It will be oheerved that the rainfall of 1848-49 is aleo given, as approximated from descriptione given me by old reeidente of the State, of the mountain etreams ae compared with their volume in years of known rainfall, and it is fairly accurate. The recorde for tbose early yeare for Stockton, which are the eame as for Sacramento, have probably been last and entered as of the same amount as for Sacramento.

A Curve

Will be traced from theee etation resulte and from the column of means and compared with the eun-spot curve.

The mean relative number of sun-epots for the yeare corresponding to the rainfall teble, as given by Dr. Wolf, is as followe:

Year.	Number.	Year.	Number.
1848	124.9	1864	45.2
1849	95.4	1865	31.4
1850	60.8	1866	14.7
1851	63.2	1867	8.8
1852	52.7	1868	36.8
1853	38.5	1869	78.6
1854	21.9	1870	131.8
1855	7.7	1871	113.8
1856	5.1	1372	99.7
1857	22.9	1873	67.7
1858	59.2	1874	43.1
1859	99.3	1875	18.9
1860	94.8	1876	11.3
1861	77.7	1877	7.9
1802	61.9	1878	
1803	45.4		

The probability that the

Present Year, (1878),

Is the extreme minimum sun-spot year of the current cycle will be made clear by the following exhibit of the epote for each month down to the cloee of October.

1878. Month.	Relative number of sun-spots.
January	.79
February	2.32
March	2.67
April	.35
May	2.35
June	1.66
July	——
August	——
September	.36
October	.74

No spots were observed duriug July and August. It may, therefore, he safely aesumed that August, 1878, was the close of the prcsent eolar cycle. The mean relative number of epots for the 10 months stated above ie but 1.11, and if a like proportion is continued to the end of the year, then it will prove to have been the extremest minimum during this century, with the possible exception of 1811.

The oscillations of the

Sacramento River,

At Sacramento, were recorded by Dr. T. M. Logan for many years, and he published a chart of their hight above low-water mark for the 13 years from 1849-50 to 1861-62, inclusive. Dr. Logan died a few years ago, and all tracee of his records after 1862 have disappeared, and no figures can be obtained till 1875, from which time on the Central Pacific Railroad Company have taken daily oheervations.

Mean Annual Hight of Sacramento River at Sacramento.

1849-59	9.5 feet	1857-58	5.7 "
1850-51	2.4 "	1858-59	9.6 "
1851-52	7.6 "	1859-60	7.4 "
1852-53	19.5 "	1869-91	8.7 "
1853-54	6.5 "	1861-62	13.9 "
1854-55	8.0 "	1875-76	9.6 "
1855-56	4.0 "	1876-77	4.5 "
1856-57	5.6 "	1877-88	11.5 "

The measuremeuts are from September to September; as during the winter of 1877 the river burst its banke and a large amount of water did not flow by the gauge, which recorded but 10 feet and 8 inchee, tbe mean hight of the water for that year has been approximated ae 11.5 feet.

Having now the rainfall of four etations for 30 yeare; the oscillatione of the Sacramento river for 16 years, and the mean relative number of eun-spote for the correeponding time, it ie poeeible to

Project the Results

Of each into curvee and to compare them eide by side. A diagram of euch curves ie ae followe:

With the tablee and diagram before him each reader can now form hie own conclusione, yet a few remarks upon the singular agreemente, diecrepancies and variatione to be eeen may not be improper.

It will be noticed that the sun-spot maxima have occurred in 1848, 1860, and 1870, in each year of which the rainfall has been much below the average; this, however, has been iu a degree harmonized by the rainfall of the next succeeding years, for it will he noticed that in 1849, 1861 and 1871, (the years next after the sun-spot maxima) the rainfall hae been greatly ahove the average. Thie shows that during two complete cycles the two maxima under consideration have nearly coincided, the rainfall maxima lagging a year behind the eun-spot maxima; and this has been proved to be the caee elsewhere with rainfall and otber phenomena. Why the rainfall of the year of maximum sun-epote should be iteelf a minimum, in the face of the powerful solar disturbance at such time, cannot be etated, but the fact is sufficient to strongly indicate the existence of a douhle oecillation of rainfall within the 11-years cycle. The yeare of minimum eun-spots are 1856, 1867 and 1878 (probably), of these the raintall of 1856 was below the average, of 1867 much above the average, while that of 1878 ie too eoon to etate; although at preeent writing there are appearing strong grounds for anticipating a minimum rainfall. Provided 1878 proves to be one of minimum rainfall, then during two complete minimum cycles we ehall have had two years of minimum rainfall and one of maximum; this last, however, is quite eufficient to destroy the uniformity of proceedings and prevente the harmonization of the two epochs. In the yeare before the date of minimum sun-epots, corresponding inversely with the results during the maximum yeare, it will be noticed that the rainfall has been much above the average, with the single exception of 1856; this again coutrihutes its quota of evidence toward the probability of a double rainfall oecillation. When the figures for two more cycles ehall have been obtained, thie double oecillation may more clearly appear.

The attention of the reader is called to the pleasing

Relativity

Of the sun-spot and Sacramento River oecillation curvee from 1852 to 1861. The river being the product of the raiufall upon the Sierra Nevada mountains, the equivalent of many millions of rain gauges, it seems reasonable to assume that were a complete and accurate record of its oscillations obtainable its curve would ehow a eurprising conformity with the sun-epot curve, directly and inversely.

By arranging the rainfall of a

Series of Years,

From 1850 to 1876, after the manner of Dr. Hunter, so ae to correspond with the sun-epot numbers for the eame years, ae divided into minimum, intermediate aud maximum groupe,

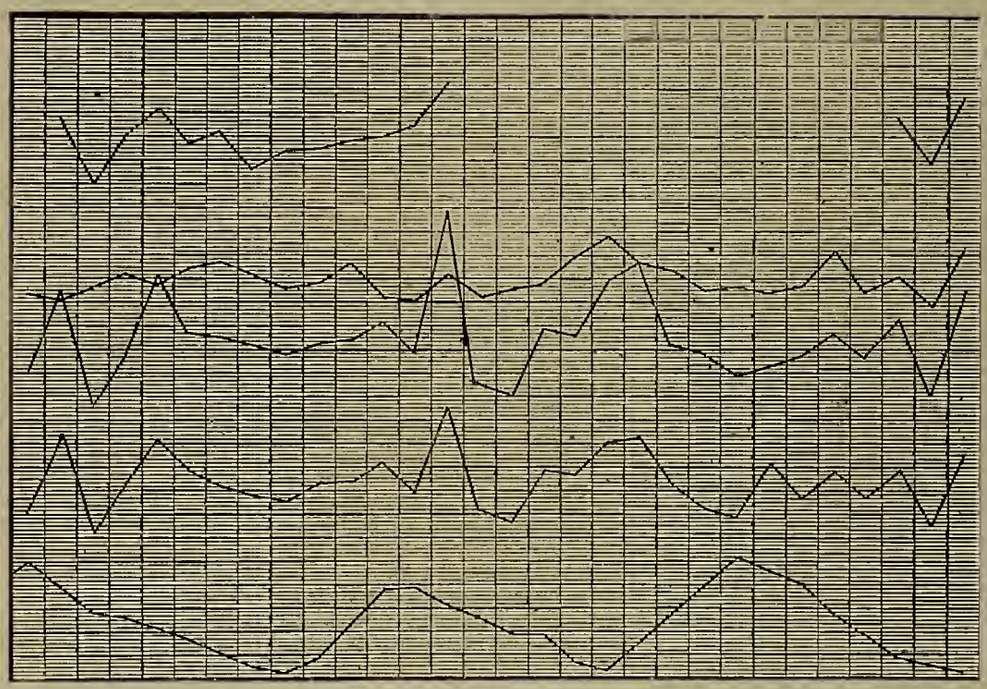


DIAGRAM SHOWING THE MEAN RELATIVE NUMBER OF SUN-SPOTS AND MEAN RAINFALL FOR THIRTY YEARS

the following result will be obtained.

Minimum years.	Mean rainfall.	Intermediate years.	Mean rainfall.	Maximum years.	Mean Rainfall.
1876	7.48	1867	20.44	1869	11.72
1885	18 97	1856	12.32	1858	16.61
1854	16.73	1868	16.56	1879	9.24
1876	25 93	1857	16.14	1850	20.85
1855	13.62	1873	19.32	1871	21.93
1875	19.89	1862	19 67	1869	14.24
1864	19.59	1861	16.34	1849	27.84
1853	19.98	1874	13.36	1872	13.25
.....	.....	1883	8.27	1861	32.92
.....	.....	1852	20.91	1859	6.92
Mean.	17.53	Mean.	16.03	Mean.	17.37

By this table it will be seen that the total rainfall in Hunter's minimum and maximum-year groups is very nearly the same, and that only the intermediate group shows a less than the average amount; which is further evidence of a

Double Oscillation

Of rainfall, and of the fact that the relative quantity of rainfall is more constant than has generally been supposed.

The above facts and deductions are further evidenced from the following table of rainfall during the actual minimum, maximum and intermediate groups (the minimum group, including the year before and the year after the actual minimum sun-spot year; the maximum, similar; the intermediate, the balance of the years in the cycle).

Minimum groups.	Rainfall.	Intermediate groups.	Rainfall.	Maximum groups.	Rainfall.
1855	13.62	1858	16.61	1859	20.85
1856	12.32	1862	19.67	1860	14.24
1857	16.14	1863	8.27	1861	32.92
.....	.....	1864	19.59	.....	.....
.....	.....	1865	18.07	.....	.....
Mean.	14.92	Mean.	16.50	Mean.	22.67
1866	25.93	1872	13.25	1869	11.72
1867	26.44	1873	19.32	1879	9.24
1868	16.56	1874	13.36	1871	21.93
.....	.....	1875	19.89	.....	.....
.....	.....	1876	7.48	.....	.....
.....	.....	1877	22.29	.....	.....
Mean.	22.97	Mean.	15.91	Mean.	13.99
Mean of both Groups.	18.49	Mean of both Groups.	16.20	Mean of both Groups.	18.33

A Curious Result

Will be noticed in the above table, that during the first cycle, from 1855 to 1866, the rainfall was strictly and directly relative to the sun-spot numbers; that during the second cycle, from 1866 to 1877, the rainfall was inversely relative to the sun-spot numbers; and that the means of the two cycles again show the nearly equal amount of rainfall during the minimum and maximum sun-spot groups. This to me, at present, seems conclusive that there is, so far, upon the average, during a sun-spot period a double oscillation in the amount of rainfall in California.

Those who have leisure and inclination may profitably compare the two last preceding tables of rainfall with corresponding tables of sun-spots, noting the differences and agreements; also, strike an average of the rainfall in the two sun-spot cycles, and compare its curve with the average sun-spot curve for the same period.

It may be interesting to construct a table of the rainfall of California from 1849 to 1874, inclusive, after the ingenious system used by Dr. Meldrum in proving the

Periodicity of the Rainfall

Of Paris and Edinburg. The column headed "mean cycle" is a harmonic mean of the preceding column, found by taking the first term, twice the second, and the third term; adding together and dividing the sum by four; and so on for each term of the "mean cycle." The variation is simply the difference plus or minus of each term of the "mean cycle" from the average thereof. This table will also show the correspondence between the rainfall and the sun-spots, and the double oscillation of the former within the cycle of the latter. The minimum years are in the second line.

Year.	1849. 1891.	1862. 1874.	Means.	Mean Cycle.	Variat'n of Rainfall	Variation sun spots for same periods.	Year of 11 years' Cycle.
1	27.84	19.67	19.25	.....	.....	.....	.....
2	6.92	8.27	7.14	12.86	— 4.29	+ 7.2	1
3	16.34	19.50	17.92	16.36	— .79	— 2.7	2
4	26.91	18.97	22.49	21.35	+ 4.29	— 13.5	3
5	19.98	25.93	22.59	22.20	+ 5.11	— 27.2	4
6	16.73	26.44	21.58	20.18	+ 3.93	— 35.1	5
7	13.62	16.56	15.99	15.94	— 1.21	— 28.2	6
8	12.32	11.72	12.92	12.95	— 4.20	— 6.5	7
9	19.14	9.24	12.69	14.95	— 3.19	+ 16.9	8
10	16.91	21.93	18.82	16.84	— .31	+ 39.8	9
11	20.85	13.25	17.05	17.42	+ .27	+ 34.3	10
12	14.24	19.32	16.78	18.43	+ 1.28	+ 24.7	11
13	32.92	13.36	23.14	.....	.....	.....	.....
..	.....	.....	.....	.....	.....	.....	.....
..	.....	.....	.....	17.15	.....	.....	.....

Here I close the subject, for the present. The reader will not fail to be struck by the

Insufficiency of the Evidence

Yet produced to prove the truth of the theory, as especially regards California, and its want of certainty compared with the value of the problem to be solved. Surely few things could be of more value to Californians than to be possessed of an infallible rule whereby to prophecy the coming winter rainfalls. This will be attained in future, but it is plain the time is not yet arrived. That Science is upon the right track, in swift pursuit of the fleeing mystery, seems apparent; but before it can be won, and this secret of nature be revealed to man and applied to his use, many years must pass by, many more sun-spots be observed and their causes known, many more measurements of rainfall from many additional stations must be made, many more observations of correlative phenomena must be recorded and explained, many more weary days and years of working and waiting must be endured. But the reward will come at last, when the mystery is revealed.

[Concluded.]

Useful Information.

A New Mode of Locomotion.

The newspaper carrier who serves papers to the attendants in the permanent exhibition building in Philadelphia, goes his rounds at the rate of 12 miles an hour. He travels on machines not unlike roller skates, which are called podomotors, according to the inventor, Mr. J. H. Hobb, an architect on Walnut street, above Fifth. The day is not far distant, predicts the Philadelphia *Record*, when the whole city will be on wheels, when pedestrians will be skimming through the streets at the rate of 10 miles an hour, without more effort than is now put forth in perambulating half that distance.

The podomotor consists of four tough, light, wooden wheels, supplied with an outer rim of tough India-rubber. These wheels are secured to a frame the shape of the foot, which is strapped to the pedal extremities in the usual manner. Unlike roller skates, the wheels of these little vehicles are not under, but are placed on each side of the foot, thus giving the wearer a good standing, as well as a solid footing. The rear wheels are three inches in diameter, while those in front are but two and one-half inches. This gives the foot a slight incline, and when in motion has much to do in impelling the pedestrian forward. Extending from the toe, with a slight curl toward the ground, is a piece of casting termed the pusher, which is simply used in mounting an elevation or steep incline. From the center of the heel a small brass wheel extends backward, serving as a guide as well as a break. The whole scarcely turns the scale at a pound weight. In using them no more effort is required than in ordinary walking. The wearer steps with his regular stride, and is amazed to find himself skimming over the ground so rapidly with so little muscular effort. Mr. Hobbs explains the mystery of the rapid movement in this manner: A man whose stride is 32 inches will traverse 48 inches, or one-half further, with the podomotor. This is because the body is in constant motion. For instance, says he, the traveler starts, and while he raises one foot to step, he continues rapidly onward until that foot is set down and the other raised to make another step. This gives him more momentum, and away he goes over the two miles in the same time to accomplish a mile with the feet. No effort of the body is required for their use, as in skates. The traveler simply puts one foot before the other, and finds himself whizzed along at a lively rate.

Frozen Fodder.—A German chemist, Dr. Paagel, has been investigating the effect of frost on cabbages and other plants used as fodder for cattle, and the best method of utilizing frozen plants. The principal change effected by the frost he finds to be a formation of sugar from starch; and as sugar has a nutritive value corresponding to the quantity of starch from which it has been produced, he considers that no reduction in the nutritive value of the plants occurs through freezing. Care must be taken, however, about the delivery of the frozen plants. First, they should not be given in the low state of temperature they possess, and then they must not be allowed to lie long after thawing, else (probably from the formation of diastatic ferments) they pass into putrefaction, and so may easily do harm. They are probably best used when given as fodder immediately after thawing, or after preparation by steeping in hot water or steaming. A long time after thawing, frozen plants cannot be given as fodder without danger.

Preserving Wheat.—It is said that in Poland, where ventilation and drying are continued for some time, wheat has been kept sound and good for half a century. Its age never does it injury, and such wheat is said to yield handsomer and better flour than that obtained from grain more recently harvested. At Dantzic, the preparation for keeping wheat continues for a year or longer, and after this period it is often kept for seven years, perfectly sound, in large granaries, although Dantzic is surrounded by the sea. These facts show how easily wheat may be preserved if proper precautions are taken. But the most striking feature is that some of the wheat found in the Pyramids of Egypt, and perhaps more than 3,000 years old, was still good enough to grow when sown, and produced a crop perfectly identical with the present wheat, proving that the character of this plant has not changed during that time.

Water in Bread.—One hundred pounds of flour contain, of dry material, 84 pounds, and of natural water, 16 pounds, while 150 pounds of bread would contain, in addition to the 84 pounds of dry substance and the 16 pounds of natural water, 50 pounds of added water. Loaves of bread become lighter in weight by baking, because during the process a larger quantity of water is driven off, and yet the reason why bread, which contains fully 40% of water after baking, retains so much of this liquid, is because during the baking the starch is converted into gum, which holds water more strongly than starch does; and also because the gluten of flour, when once thoroughly wet, is very difficult to dry again, forming a tenacious coating round every hollow cell in the bread, retaining the gas and water. Again, the dry crust which forms round the bread in baking is nearly impervious to water, and prevents the moisture within from escaping.

Paraffine as a Lubricant.—A correspondent of the *Railroad Gazette* announces that the Erie railroad has reduced its oiling expenses from $5,000 to $1,000 a year by using paraffine on passenger car journals, and has reduced the number of hot journals from 535 to 332. It is now used during the winter months, without the addition of any other oil, but it is found that in summer it becomes so limpid that it is hard to keep it in the axle boxes. During the summer months it is therefore mixed with some other lubricant to give it more "body."

Coating Copper Plates with Iron.—Prof. Bottger recommends the following solution for coating copper plates with iron: Ten parts of ferrocyanide of potassium and 20 parts of tartrate of soda are dissolved in 220 parts of distilled water, adding a solution of three parts of sulphate of iron in fifty parts of water. Caustic soda solution is poured into the mixture until the Prussian blue formed is redissolved.

The oldest pieces of wrought iron which are known are probably the sickles found by Belzoni under the pedestal of the sphinx, in Karnac, near Thebes; the blades which Wyse found imbedded in the wall of the great pyramid; and the piece of a saw which Layard dug up at Nimrod. These remains are now owned by the British Museum.

Woods Heavier than Water.—The woods which are heavier than water are Dutch box, Indian cedar, ebony, lignumvitæ, mahogany, heart of oak, pomegranate, vine. Lignumvitæ is one-third heavier, pomegranate rather more. On the other hand, cork, having a specific gravity of .24 and poplar of .383, are the lightest woody products.

Good Health.

A National Department of Public Health.

Mr. Lamar's bill, now before Congress, "To establish a new Department of Public Health" at Washington, having been already read a second time and referred to a committee, the necessity is urgent for an immediate and thorough examination of the merits of the proposed measure, the importance of which cannot be overrated.

The aim of Mr. Lamar's bill is for the purpose of acquiring and diffusing useful information on subjects connected with the public health; to establish, direct and manage sanitary and quarantine systems and regulations throughout the States and Territories of the United States; to supervise the Marine Hospital service, and to organize and direct a corps of sanitary engineers competent to superintend all public works so far as their construction may affect the public health.

The chief executive officer of this Department will be styled the "*Director General of Health.*" It will be his province to perform all the duties and exercise all the powers now devolving upon the Supervising Surgeon-General of the Marine Hospital service, which office is abolished by the bill. He will make and enforce all quarantine and other regulations for the prevention of cholera, yellow fever, and other epidemic diseases. He will also have power to select sites and establish quarantine stations and erect buildings. It will also be his duty to prepare suitable tables at the taking of each census, to embody such facts relating to births, deaths and marriages, the prevalence of disease or other data which may serve as a basis for securing a complete system of vital statistics for the United States, and make an annual report of his Department to Congress.

The work of the Department will be carried out by whatever additional officers are required, including chief clerk, chemists, engineers, scientists, experts, etc. The Director will also have the power, under this bill, to employ at all times persons of proper scientific knowledge and skill, to make special investigations on subjects connected with the public health, awarding these compensation, as he deems reasonable and just.

In this connection it may be remarked that the American Public Health Association has recently prepared and presented a report in regard to the character of the action which Congress should take in this matter. This association advises that Congress should take no steps at this time to organize a permanent national department of health, believing such legislation would be hasty and unsatisfactory. They, however, expressly state that they are not opposed to a national quarantine system, but that it is impossible to organize such a system at the present time.

The Association, however, make the suggestion that Congress shall immediately provide for the proper organization of a "Provisional National Health Commission," the objects and duties of which shall be to report to Congress at its next session a plan for a permanent national public health organization, to be prepared after consultation with State Boards of Health, and withal possessing special knowledge and experience on the subject. They would also take charge of investigations into the causes and prevention of yellow fever and other epidemic diseases, and such administrative duties connected with the investigations, which, I presume, means the direction of preventive measures in regard to any outbreak of yellow fever, which may probably be looked for during the approaching summer.

The memorial is full of excellent suggestions in regard to the organization of the Commission, and, in this respect, forms a great contrast to the bill of Mr. Lamar, which is crude in form, and in effect creates an absolute dictatorship of health, with unlimited powers for good or evil.

Dieting for Health.

Dieting for health, says *Hall's Journal*, has sent many a one to the grave, and will send many more because it is done injudiciously or ignorantly. One man omits his dinner by a herculean effort, and thinking he has accomplished wonders, expects wonderful results, but by the time supper is ready he feels hungry as a dog, and eats like one, fast, furious and long. Next day he is worse, and "don't believe in dieting" for the remainder of his life.

Others set out to starve themselves into health, until the system is reduced so low that it has no power of resuscitation, and the man dies.

To diet wisely, does not imply a total abstinence from all food, but the taking of just enough, or of a quality adapted to the nature of the case. Loose bowels weaken very rapidly, total abstinence from all food increases the debility. In this case food should be taken, which, while it tends to arrest the disease, imparts nutriment and strength to the system. By resting on a bed, and eating boiled rice, after it has been parched like coffee, will cure three cases out of four of common diarrhœa in a day or two.

Others think that in order to diet effectively, it is all-important to do without meat, but allow themselves the widest liberty in all else. But in many cases, in dyspeptic conditions of the system particularly, the course ought to be reversed, because meat is converted into nutriment with the expenditure of less stomach power than vegetables, while a given amount of work does three times as much good, gives three times as much nutriment and strength as vegetable food.

Man's Age.

Few men die of old age. Almost all die of disappointment, passion, mental or bodily toil, or accident. The common expression, "choked with passion," has little exaggeration in it, for even though not suddenly fatal, strong passions shorten life. Strong-bodied men often die young; weak men often live longer than the strong, for the strong use their strength, and the weak have none to use. The latter take care of themselves, and the former do not. As it is with the body so it is with the mind and temper. The strong are apt to break, or, like a candle, to run; the weak to run out. The inferior animals that live temperate lives have generally their prescribed number of years. The horse lives 25; the ox 15 or 20; the dog 10 or 12; the rabbit 8; the guinea-pig 6 or 7 years. These numbers all bear a similar proportion to the time the animal takes to grow to its full size. But man, of all the animals, is one that seldom lives this average. He ought to live 100 years, according to physical law, for five times 20 is 100; but instead of that he scarcely reaches on an average four times his growing period; the cat 6 times, and the rabbit even 8 times the standard of measurement. The reason is obvious, man is not only the most irregular and intemperate, but the most laborious and hard-worked of all animals. He is also the most irritable, and there is reason to believe, though we cannot tell what an animal secretly feels, that more than any other animal, man cherishes wrath to keep it warm, and consumes himself with the fire of his own secret reflections.

Chloral as a Counter-Irritant.—Among the many uses to which chloral has been put, we have not met before with the following from the *Bulletin Therapeutique:* Made into a mass with gum tragacanth, spread on paper and applied to the skin, it will produce a blister without pain. Applied as a powder, on cotton, it causes a painful burning sensation. By the former method a portion is absorbed, and the patient falls asleep. Its action is not so uniform as cantharides, but as a mild vesicant, or an agreeable revulsive, the author quoted would commend such "chloral paper" to physicians, the more so, as it will keep for months without losing its activity, if well prepared.

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The Week.

All this week we have been visited by a welcome, good old-fashioned rain, which is worth millions to us, for it hrings ue strong hopes of a plentiful crop. News from the hydraulic mining sections represents that they had heen nearly all limited in operations through lack of water, and to them this storm will be a godsend. But little of interest has occurred in mining circles, except that the Bodie miners have struck for higher wages and forced the mills to shut down. There is some excitement in Oregon over new finds in gravel washings, and a false one in Gilroy over a fictitious silver ledge.

Political parties are waking up and striking the preliminary notes to the coming campaign. Conéiderable discussion is heard coucerning the University land hill, now before Congress, and the facilities it affords for "grabbing."

From Africa comes the tidings that the Zulus have utterly annihilated a British army, which affords a text for Gladstone from which to preach Beaconsfisld a sermon.

An indignant wail comss up from Arizona over the assignment of certain of her lands by Congress, to the Indians for a reservation.

Serious charges of corruption have been laid before the Board of Supervisors against the Board of Education and others implicated in the late school scandal.

Weather Districts.—The War Department weather map was recently received at the United States Signal Service office in this city. The map, which contains the United States and Canada, is divided into 20 districts or regions. Those of the Pacific States include California, Oregon and Washington Territory. The North Pacific region includes that portion of Oregon and Washington Territory west of the Cascade mountains. The Middle region, includes California, north of Monterey bay and west of the Sierra Nevada mountains, thus embracing San Francisco. The Southern region includes the remaiuing southern portion of California west of the Sierra Nevadas.

Water Wanted Everywhere.

The newspapers from the mining districts of California come to us laden with complaints about the inadequate water snpply, which, it appears, has of late heen not only insufficient to meet the needs of the miners, but, in some instances, there has heen too little for even ordinary domestic uses.

The Nevada City *Transcript*, of recent date, says that the reservoirs for furnishing that town with watsr had heen nearly empty for several days, to the great inconvenieuce of the inhabitants and the imminent exposure of the place to damage from fire; that journal, iu a subsequent issus, proceeding to remark upon the extent to which hydraulic mining in that neighborhood is crippled through this same insufficient supply of water. Nor is this complaint confined to the town and vicinage above mentioned. It is general throughout the miniug districts of the State. It comes to us from every quarter; it meets us wherever we go. It is instant and all-pervading, the expression of an urgent, universal want.

We made a flying trip last week to the interior, visiting some of the old mining camps and towns low down on the Mokelumne, near the houndary line hetween San Joaquin and Calaveras counties. These are dead places now—they died from want of water; supply them with this, and they would spring to life again, and not only regain their former prosperity, but perserve the teuure of their sxistence longer than before. Not only so; with water, new and flourishing camps would arise in localities where the diggings remain virgin, or have heen hut little exhausted, for this section of country ahounds with such. It is true, the river hars and the gulches have heen worked out. The more superficial deposits where water could he had have everywhere heen considerahly depleted. But there remain, right in this neighhorhood, where miniug was commenced at a very early day, and has since been actively continued, in so far as there has heen water for carrying it on, heavy hanks of rich gravel hardly yet touched; deep-lying heds of auriferous cement; old channels full of undisturhed wealth, with thousands of acres of shallow diggings easily worked, and sure to pay if only water were brought upon them.

Lct it be ohserved, too, that we are speaking now of a comparatively ohscure locality—of mines away down in the foothills, just on the lower edge of the main gold helt—of localities concerning which we hear hut little now-a-days. Lancha Plana, Poverty Bar and Comanche were formerly famous mining camps, though not much is said ahout them of late. Still, therc is a great extent of good mining grouud at or near these places. The hills around them are full of gold, the diggings heing often shallow and easily worked. What ie known as the sand ridge, extending for six or eight miles along the eouth side of the Mokelumne, forming, in fact, the hank of that river, is composed wholly of gold-hearing gravel, that would pay enormously if worked hy the hydraulic method with even a moderate amount of water. Some of this ground has well rewarded the labor of drifting, and a great deal of it would, no douht, do so. Then there is Cat Camp, lying off a mile or two to the south, where a thousand men might earn for themselves fair wages, if they had water for piping. All through this region a multitude of men might find employment, or rather employ themselves, if this one great want could be supplied to them.

And not in the mines alone could an increased water supply hé used here to advantage. There is a supurb farming country below them with an equally fine fruit-growing district all ahout them that stands much in need of increased irrigation facilities, their means in this respsct heing wholly inadequate to present, saying nothing of prospective requirements. It is hardly too much to say that the value of property throughout this entire region—that is, its productive capacities—would he enhanced fully 50% were it furuished with even a moderate supply of water.

From the prevailing dearth of this life-giving element, it would naturally be inferred that it was not to be had, certainly not withiu easy reach. And yet there is plenty of it; plenty, in fact, that, at a small cost, could be made practically available for every purpose. There is at this moment running to waste in the Mokelumne river 100,000 miners' inches of water, possihly twice that amount. It flows, as it ever has been suffered to flow, right through this splendid region, so full of resources and possihilities, without auy efforts having been made, or at least consummated, for its diversion and employment in ths development of this natural wealth and the creation of new industries. An association was organized a few years ago, known as the Mokelumne Ditch and Irrigation Company, for the purpose of building a ditch, through which to introduce a portion of this water upon the farming and mining lands along the south side of the river; the scope of country intcnded to he covered hy their operations reaching south to the Calaveras river and west to the tule land, the whole comprising an area of 300,000 acres. This company, which is made up of leading farmers residing iu the district and some of the prominent business men of Stockton, having first secured a franchise to 100,000 miners' inches of the water flowing in the Mokelumne river, proceeded to construct a substantial dam across that stream; their expenditures to date for improvements made, right of way ohtained, etc., amounting to something liks $75,000 or $80,000. They are already now to commence huilding their ditch, for the accomplishment of which they require some pecuniary aid—$100,000 or thereahouts. As security for a loan to that amount they propose giving a lien upon their corporate properties and possessions, water privilege and right of way included, with such other guarantees as would make the loan ahsolutely safe. They want the money for a term of years and are willing to pay a fair hut not an exorhitant rate of interest, as they should not, in view of the unexceptionally good security they are ahle to give. The money could bs obtained near home, but the rates of interest required are too high to meet the views of men engaged in such a legitimate and purely husiness-like enterprise, and the success of which they would not like to imperil hy any unnecessary hurdens. Besides, it is their purpose to furnish this water, when ready for delivery, to their patrons at ths lowest possihle rates; a policy that would hardly be feasihle if they have themselves to pay usurious interest for the use of money to carry out their project. It seems to us that our home capitalists, and others having money to loan, ought to find in this offer of ths company a good opening for placing some of their surplus funds. If there is on this coast any more valuahle species of property than a water franchise like this, we have yet to learn what it is; or if there is any other class of improvements calculated to confer greater or more lasting henefits upon the entire community than the project here alluded to, we are alike ignorant of its character. Of all the enterprises that invite capital, these ditch schemes are the most heneficent and entirely safe. Our supreme want in California is a cheap and ample water supply. This need is an ever-present exigency—urgent and incessant. Our requirements in this dirsctiou are many and multifarious, and they are constantly increasing. They grow with our growth and multiply with our population and new industries. We may be said to he forever suffering from drouth iu eome shape—a sort of perpetual water famine.

Let Our Miners Stop and Make Homes.

The epoch of the mining tramp has about passed away. The *stampede* has become a legend of the past. Those sweeping and impulsive movements that formerly carried the masses away to some far off locality—the more distant and difficult of access the hetter, have ahout subsided, or occur now only in a mild and suhdued form. They were, for the most part, ill-advised and senseless even in their hest days—these flighty movements of the multitude—seeing our miuing districts prcsent everywhere ahout an average amount of advantages, taken as a whole. Nothing tends to show this more conclusively than the fact that so many of our miners after leaving the sites of present labor, wherever they may have been, and going off after these reported "hig things," find their way hack after awhile to their starting point, satisfied there to remain; their acquaintance with the old diggings, and the home-like feeling that comes to them on getting hack among former scenes and acquaintances, more than compensating for any advantages they could hope elsewhere to enjoy. It is, indeed, the case that there is eo much in any and every part of the mining regions of this coast that ought to satisfy the man in pursuit of a pleasaut and remunerative field of labor to stop and be contented wherever his fortunes or enterprise may happen to cast him, that it is strange that any should fail to see the matter in that light.

Let the miner then tarry just where he is and there go to work cheerfully and resolutely, making the most of the opportunities around. Having secured a mine or some sort of interest in a mining property, let him next get hold of some land, the best within easy reach, and on it establish a house, improving it and gathering about him as many conveniences and comforts as possible. To this end fruit trees ehould be planted, a garden be cultivated, some land for grain-growiug be enclosed, a cow or two, soms chickens, and a team perhaps being added to his domestic establishment. If his means he limited, he has only to set to work at once, beginning in a small way, and he will himself be astonished at the rapidity with which he will get ahead. The most of the work required for accomplishing all this can he put in at odd spells, so that he will really loose very little valuable time in the end. In most parts of California there occur periods during the year when the miner cannot work his claim to advantage. In some localities this will he owing to the deep snow of winter, in others to the lack of water in the summer; the miner, through a variety of causes, having always more or less leisure for securing and improving a homestead. Let him be careful then to employ these spare hours in working for the end indicated, for they will form not only very pleasant places of abode hut also really valuahle properties by and by—these little planted patches and rude homes in the mountains.

Now, while the old-fashioned craze that sufficed to empty the population of one locality suddenly into another, has so mauifestly abated, it is still the case, that the average miner, when he reads in the papers (and he is a much reading man) ahout the big ore-finds reported here, there, and elsewhere, is apt to grow restive, and despite his past experience, itches to try his fortune ones more in this new-found El Dorado; the chances heing almost even that the evil one will put it into his head to roll up his hlankets, lock the door of his cahin, and join the rush in search of this "Kidd's Treasure," wherever rumor may happen to have planted it. And thus it is that this class of men, loosing sight of the doctrine ahove enunciated, that one ssction of the mines is, ou an average, as good as another, and disregarding the truth of the old adage ahout the rolling stone, have generally remained poor in the midst of illimitahle wealth, and restless though surrounded hy the most splendid opportunities. It is tims for them to wholly suppress this migratory spirit; stop where they are, make homes, cultivate a feeling of contentment and leave these outside opportunities, always so far off and generally so delusive, for another and less experienced class of adventurers.

The Camel on the Pacific Coast.

The first, and we helieve the only lot of camels ever hrought west of the Rocky mountains, was a hsrd of soms dozcn or more that arrived in Nevada from Texas, in 1861. They were originally brought out for the purposs of packing salt from Teel's marsh for the use of ths Washos silver mill. This marsh, then supposed to he the only saline in the State, is located in Esmeralda county, nearly 200 miles from Virginia City, the country hetween these points heing dry, desert and sandy. As salt was an indispcnsable article in the reduction of these silver-hearing ores, the millmen had hefore this been compelled to import it at heavy cost from San Francisco. The introduction of the camel into the country for salt packing from a point so remote and difficult of access, was, as suhsequent experience showed, a hit of good economy; the price of this commodity having, in consequcnce thereof, heen reduced from a hundred dollars or more per ton to ahout one-third that amount. After a year or two a more abundant deposit of salt, and of a hetter quality, was discovered near Sand Springs, Churchill county, and distant from Virginia City only 75 miles, the most of the country to he traversed being favorable for wagon transportation. From this time on tcams were employed for hauling in salt, and the use of the camels for this service having heen superseded, these animals were turued adrift upon the deserts where they were left to shift for themselves, having afterwarde been used only at intervals for packing to soms distant and out-of-the-way mining camp, or other locality, not easily reached by wagous.

After this partial ahandoument, these creatures, already terribly galled and hrokeu down through overloading and bad usage, hegan to recuperate and increase, a number of young ones having heen horn during the next few ycars; and before they left the State, which it seems thcy afterwards did, having heen driven to Arizona. We had lost sight of these "ships of the desert," not having, for a number of years, heard anything ahout them. It appears, however, as we gather from the Yuma *Sentinel* of Arizona, that they were some two years ago taken to that Territory, in the hope that they might there he profitably employed; as one would naturally expect would he the case, in view of the arid, barren and sandy character of the country to be traversed. But here again, as in Nevada, these "ships" seem to have heen stranded on the reef of disappointment. Their owners could not make them pay, the teamsters, even in that arid and sterile region, being ahle to carry freights cheaper than they; wherefore the hrutes were again turned out to shift for themselves, the owners having let them looss on the Gila eastward from Yuma, where they have been running unlooked-after ever since; and of course thriving and multiplying as is their wont when uncared-for by man. Nothing seems to suit the creature like being let alone. This ie especially the case if the looking after is to come from the average Mexican or American, who have, seemingly, neither the patience uor judgment to deal with him properly. We well remember how shamefully these docile creatures were overtasked and maltreated in Nevada, eome of them having died from their heatings and overhurdens, and we ars sorry to see that they have fared but little hetter in Arizona. The teamstere and packere there have heen making targets of them on eight, the excuse for this inhumane practice heing that they startle and even frighten by their ungainly appearance the horses, mulee and donkeys of these worthy people. Thie is, of course, good reason for sending a hullet through the unsightly hrutes whenever they are so careless as to make their appearance.

It is well now for these animals, especially the camel, that the railroad up the Gila carries everything heyond his present place of sojourn, thereby superseding the necessity for employing draft and pack animals along this part of the ronte, and, inferentially, also their drivers. It is to be hoped now that the hides of the inoffensive bcasts will no longer he punctured by the deadly missel of the "bnllwhacker" or the pilot of the "prairie schooner," but that they will be suffered to browse on the luxurious cactus and propagate in peace, their backs unchaffed by the galling pack, till such time as their services will bc required ou the sterile and waterless deserts of southeastern Arizona and the regions beyond.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

NON-CORRODIBLE MATERIAL FOR QUICKSILVER CONDENSERS.—H. H. Eames, S. F.—Dated, January 28th.—In the separation of mercury from its ores, considerable quantities of sulphurous and sulphuric acids are produced, and these acids act with great energy upon iron condensers, so that in a short time they are rendered useless. This destructive action does not take place in the first two or three of the condensers, as these are comparatively hot, but as the aqueous vapors condense, the action commences and they attack the iron with great energy. To remedy this difficulty, Mr. Eames employs a material which will resist the attack of acids and other destructive substances, and the condensers may either be constructed entirely of this material or lined with the material; or it may be employed in the form of partitions or plates, either with or without perforations to arrest the mercurial vapors. In some cases it may be found advisable to make a foundation of iron or other material, and this foundation coated with the compound. By means of this compound, the inventor forms a perfect resisting surface to the action of acids and vapors, and a mercurial condenser is made which is affective at the lower temperatures and where the aqueous vapors begin to condense. It is easily constructed on the spot and may be repaired without difficulty. Mr. Eames has used this compound for some time with great success, and one of the large brick condensers at the New Almaden mine has been lined with it recently and is now in use.

INDICATING APPARATUS.—Hans Bebr, Virginia City, Nev. Dated, Jan. 28th, 1879. This invention relates to that class of indicators which are used in hoisting or winding engines to indicate to the engineer the position of the cage in the shaft. A drum carrying a helix is mounted on a shaft operated by the main shaft, on which the reel carrying the rope and cage is mounted, said helix having marks or numbers on it corresponding to the position of cage in shaft. The revolution of the shaft carrying drum and helix operates two screw shafts which carry an indicating bar and pointer, said bar and pointer moving in a plane in the direction of the axis of the drum and following the helix, so as to point out the position of the cage on the end of the rope in the main shaft. This apparatus has recently been put in use on the Comstock, and we described it in detail a few weeks since in speaking of the machinery for the North Con. Virginia mine, which was made at the Union Iron Works in this city. It is the best improvement in this line yet devised.

ATTACHMENT FOR BOTTLE FASTENINGS.—Stephen Martinelli, Watsonville.—Dated, Jan. 28th.—This invention relates to a novel attachment to the fastenings of bottles, such as are employed to hold the corks in place where effervescing liquids are confined. These fastenings consist of a curved metal cork, so hinged at the sides of the bottle neck, as to swing over the cork to retain it in place after the bottle is filled, and they are pulled to one side when it is desired to remove the cork. It is often very difficult to remove these fastenings, as they become embedded in the cork by the internal pressure. This invention consists in the employment of a lever attachment to the link or fastening, so that the inventor is enabled to overcome any strain and remove the fastening at any time, with very little effort.

STEP LADDER.—E. W. Benjamin, S. F.—Dated, Jan. 28th.—This invention in step ladders consists in arranging a slide so as to move in grooves on the supports or bracing standards; said slide being also suitably attached to the steps by means of arms, so that when the supports are extended the arms hold the slide firmly, thus uniting the steps and the supports solidly together, and preventing any liability of the ladder shutting up. A cord attached to the slide leads to a ring or pulley on the top of the step, by means of which the slide may be moved up in its grooves, and the supports or standard thus brought back against the steps, leaving the ladder on a compact form when not in use.

JEWELRY.—Robt. W. Edwards, S. F.—Dated, Jan. 28th.—This invention relates to certain improvements in jewelry, and it consists in a novel method of forming rings, pins, bracelets, earrings and similar articles, so that the ornamental seal, brooch or pendant may be reversed to give a different front at pleasure with the same frame or ring.

JOHN O. WINSHIP, a lawyer, and Postmaster Sweet, of Windham, Oregon, have been sentenced each to $1,000 fine and one year in the county jail for conspiring to defraud their creditors.

THE rafting of logs on Eel river this winter has been attended with success.

The North Bloomfield Gravel Mining Co.

We have received the annual report to the stockholders, of the North Bloomfield Gravel Mining Co., with a statement of accounts from October 1872, to December 31st, 1878. The superintendent of this company is Henry C. Perkins, and the general manager, Mr. Hamilton Smith, Jr., the well-known hydraulic mining engineer. The report is, like all previous ones of this company, prepared with the greatest care and detail, and will serve as a model for mine reports. There are a great many interesting facts in this report, from which we condense the following:

Washing was commenced at the North Bloomfield mine on January 12th, 1878, and continued until October 10th, when the annual clean-up was made. After this clean-up only 40,000 inches of water were used in November and December. In this report a miners' inch is always assumed per a flow of 24 hours, being equivalent to a discharge of 2,230 cubic feet of water.

The following statement shows the amounts of bullion produced, and water used for 1870 to the close of 1878:

Time.	Inches used.	Yield per inch.	Gross product.
1870–4	710,987	13.6	$ 90,700.00
1874–5	386.972	19.2	74,271.77
1775–6	700,000	27.5	192,735.73
1876–7	595,000	48.9	290,775.42
1877–8	796,449	39.1	311,276.70

During the past season more water was used and more bullion produced than for any previous year. The yield per inch was 39 1-10 cents as against 48 9-10 cents in 1877. This diminution of yield has been chiefly due to the comparative poverty of the gravel channel worked last year. The main tunnel has been extended from No. 7 shaft about 1,300 feet and connected with the workings by shaft No. 9. A sluice has been placed in this extension, and hereafter all the up-stream gravel will be washed through it. The cost of this extension and new shaft amounted in 14 months to $27,896.

The tunnel was extended in nine months 1006 feet, with a section of nine feet square. Burleigh drills, driven by a Burleigh compressor, were used. The progress made averaged 112 feet per month at a cost of $24 per foot, including a full allowance for wear and tear of machinery and superintendence. Only one shift of drillers was employed; by increasing the number of workmen, probably 175 feet would have been driven each month, at about the same cost per foot. Previous to the use of these drills, three shifts of miners in the same tunnel averaged a speed of 25 feet per month, at a cost of $27 per foot.

Up to this time about 10,000,000 cubic yards of gravel have been washed through the Bloomfield Tunnel over its natural or bedrock floor, but the resulting wear has in no way impaired its usefulness.

The cost per inch of water during the last season was a trifle over two and a half cents, or one-third less than for previous years, and being at the rate of one cent for each ten-hour inch.

The Bowman reservoir dams have been finally completed, at a cost of $15,082; making a total cost of $96,640 as cost of enlargement from the old 72-foot level. These dams are very substantial, and compare favorably as regards stability with similar large structures in other parts of the world. The reservoir will now contain 907,000,000 cubic feet of water, or 410,000 24-hour inches.

The ditch and pipe conducting the waters of Texas creek into the main canal, four miles below the Bowman reservoir, have been completed at a total cost of $23,779. The pipe is an inverted syphon 4,400 feet long, 17 inches in diameter, made of riveted plate iron, with its inlet 310 feet above outlet, and sustaining a maximum pressure of 770 feet, or 334 pounds per square inch. It discharges about 1,250 miners' inches with the full head of 310 feet.

A telephone wire has been built along the line of the works, and is found of great convenience.

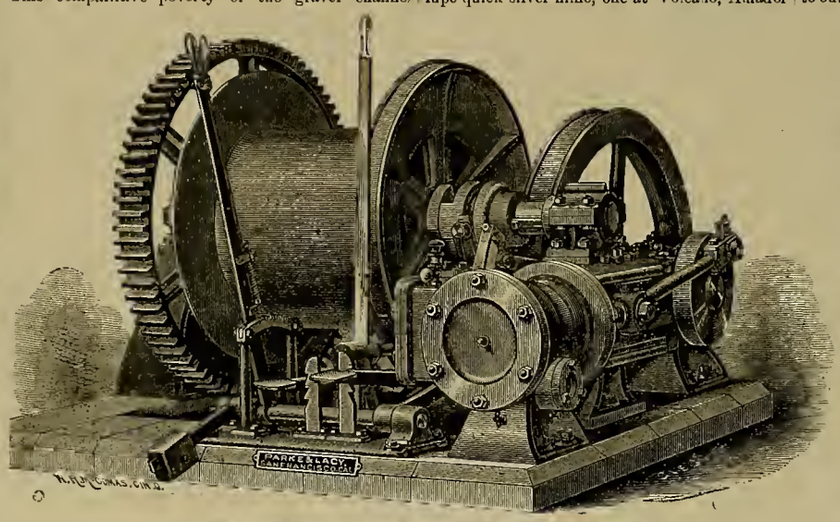
The Trustees, at the special request of the miners, decided to receive from them their surplus earnings, paying seven per cent. interest thereon: the funds derived from this source to be invested in the bonds of the company. This action was deemed advisable to inculcate saving habits in the workmen, and give them a personal interest in the company.

The completion of the Bowman dams and Texas creek pipe has finally closed the construction account of the company. For some five years past a large part of the earnings have been spent in this way. The manager considers that the outlook for future profits are very favorable, as a constant water supply is now assured for the entire year, except in very exceptionally dry seasons.

The tables accompanying this report show the expenses, etc., of the mine in the greatest detail, and are very carefully prepared. Items of mining cost, water cost, yield, profits, etc., are given in tables which show plainly the proportions of all with relation to each other.

An Improved Hoisting Engine.

The accompanying engraving represents the Niles improved hoisting engine for mining purposes. These engines are made double with single drum, double engines with double drum, and single engines with double drum, geared to suit requirements. They are made for surface or underground work, and to be run by steam or air. Messrs. Parke & Lacy, the agents, have put several of this type of hoists in operation in this State, one pair of 8x12 being at the Guadalupe quick silver mine, one at Volcano, Amador county, etc. These engines are very compact, and as the gearing is all cut they are noiseless in running. The engraving shows a 10x12 engine. This engine will hoist 2,500 pounds 1,000 feet with 60 pounds of air.



THE NILES IMPROVED MINING HOIST ENGINE.

POSTAGE ON NEWSPAPER ARTICLES.—We never could quite understand why matter written for a book should be carried in the mail for one cent an ounce, while matter written for a newspaper should be charged six cents. The public certainly has more interest in articles written for newspapers than for books, and if any favor is to be shown it should be on the side in which the public has the greatest interest. There is a chance that at least the discrimination against newspaper articles may be removed, for we read in the *Prairie Farmer* that a bill before Congress, introduced by Representative Carlisle, of Kentucky, among other things, provides that hereafter all manuscripts intended for publication in, and mailed to the editor or publisher of, any newspaper or periodical, issued at stated periods from a known office of publication, and all proof-sheets and corrected proof-sheets thereof, shall be included in mailable matter of the third class, and shall be charged postage at the rate of one cent for each ounce or fraction thereof, provided the same be the production of the editors of the journals, or regular or authorized correspondents or contributors. It is to be hoped it will become a law.

MR. J. S. PHILLIPS the well-known mining engineer and author of Phillips' "Explorers' Miners' and Metallurgists' Companion," has removed his chemical laboratory and general mining offices to No. 702 California street, where he is prepared to give practical instructions on mineral analysis, assaying, and the general subjects of mining and metallurgy. Mr. Phillips has been a practical operator for many years, and is now much better fitted than ever for giving instructions on the various branches. Testing and assaying are taught to prospectors for especial mountain requirements.

Vulcan Blasting Powder.

This is the name of a blasting powder well and favorably known on this coast. Until recently it was manufactured by Messrs. R. W Warren & Co., but this firm has now been succeeded by the Vulcan Powder Co., office 123 California street, in this city. The company owns two works. The first erected about four years ago near Reno, Nevada. This is the smaller of the two, covering about five acres. The number of men employed is 15; the motive power, water, capacity about one ton of powder per day. The second works were built about six months ago near San Pablo, Cal. These latter works are complete in every particular, and at their fullest capacity can turn out ten tons of powder per day. The company here owns a tract of 250 acres, 12 of which are covered by the mills, sheds and other buildings necessary in the manufacture of the powder; 20 to 30 men are constantly employed. Steam power alone is used as a motor. No sporting powder turned out, the company confining itself strictly to the manufacture of mining powders. Vulcan powder, when ready for market, is in the form of cartridges, varying from ⅝ inch to 1¼ inches in diameter, and from 4 to 8 inches in length. It is packed in cases of 10, 25, 50, and 100 pounds.

Vulcan powder is of three grades: Nos. 1, 2 and 3. No. 1, is claimed to be the strongest powder in use, its strength equalling that of liquid nitro-glycerine. No. 2, is said to be so strong that, except in the hardest rock, it answers every purpose. No. 3, is a slower powder than the other two, and more adapted to outside work and quarrying. These powders are a composition of nitro-glycerine and other explosives, which latter act as absorbant, consequently there being no inert matter, as in other "high explosives," every particle of it exert explosive force, not an iota of power being lost. Another advantage claimed, is that the materials used in its composition, being all decomposed by its explosion, nothing is left to float through the mine where the men have to breathe, and consequently inhale the dust, as is said to be the case when a non-explosive absorbant is used in the manufacture of a mining powder. As the smoke from Vulcan powder passes off quickly, the miners can soon after a blast resume work, thus saving time and expense.

As an indication of its high reputation, we are informed that it is was given the preference over all other high explosives, by the U. S. Engineering department at New York, in the "Hell Gate" excavations. On this coast it is largly used in prominent mines in California, Nevada, Montana, Idaho, Utah, Arizona, Mexico, etc., etc., also in important railroad works, and wherever a blasting powder is required.

In the new company, prominent mining men are interested, and thoroughly understanding the wants of the mining community, we have no doubt that Vulcan powder will, in the future, add to its already good reputation, as a strong, safe, uniform and reliable explosive. The officers of the company are: Hamilton Smith, Jr., President; Ralph L. Shainwald, Secretary; R. W. Warren, Manager. Directors—Hamilton Smith, Jr., R. W. Warren, L. L. Robinson, J. Baum and J. P. Pierce. Office, 123 California street.

Dangerous Things (?)

The echoes of the Giant powder explosion have not yet ceased reverberating it seems, though it is only in the fainter form of nerve tremors hy the interested public, or, perhaps, of pen throbs by those who do the writing for them. "Box" takes one of the latter to task as follows:

EDITORS PRESS:—A correspondent of the *Morning Call* has written a long article upon deadly poisons and explosions, wherein he (or she) states that "cyanide of potassium" is so dangerously destructive to life that merely sprinkling a sore or tasting it would cause death in a few minutes; and that there is a fulminate of gold with such amazing strength that even a small pill-box would contain sufficient to destroy "all London, or the largest army." Beware! for it is as dangerous to write upon a subject you do not understand as it is to handle deadly drugs. Box.

S. F., Jan. 23d, 1879.

A STRONG company has been organized for introducing a large amount of water from the Mokolumne river upon the farming lands lying between that stream and the Calaveras.

QUITE a severe earthquake shock was felt in Visalia Monday night about 12 o'clock.

HAY is selling in the fields near Bakersfield at $4 per ton.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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Our latest forms go to press on Thursday evening

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A. T. DEWEY. W. B. EWER. G. H. STRONG.

SAN FRANCISCO:
Saturday Morning, Feb. 15, 1879.

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The Week.

All this week we have been visited by a welcome, good old-fashioned rain, which is worth millions to us, for it brings us strong hopes of a plentiful crop. News from the hydraulic mining sections represents that they had been nearly all limited in operations through lack of water, and to them this storm will be a godsend. But little of interest has occurred in mining circles, except that the Bodie miners have struck for higher wages and forced the mills to shut down. There is some excitement in Oregon over new finds in gravel washings, and a false one in Gilroy over a fictitious silver ledge.

Political parties are waking up and striking the preliminary notes to the coming campaign. Considerable discussion is heard concerning the University land bill, now before Congress, and the facilities it affords for "grabbing."

From Africa comes the tidings that the Zulus have utterly annihilated a British army, which affords a text for Gladstone from which to preach Beaconsfield a sermon.

An indignant wail comes up from Arizona over the assignment of certain of her lands by Congress, to the Indians for a reservation.

Serious charges of corruption have been laid before the Board of Supervisors against the Board of Education and others implicated in the late school scandal.

Weather Districts.—The War Department weather map was recently received at the United States Signal Service office in this city. The map, which contains the United States and Canada, is divided into 20 districts or regions. Those of the Pacific States include California, Oregon and Washington Territory. The North Pacific region includes that portion of Oregon and Washington Territory west of the Cascade mountains. The Middle region, includes California, north of Monterey bay and west of the Sierra Nevada mountains, thus embracing San Francisco. The Southern region includes the remaining southern portion of California west of the Sierra Nevadas.

Water Wanted Everywhere.

The newspapers from the mining districts of California come to us laden with complaints about the inadequate water supply, which, it appears, has of late been not only insufficient to meet the needs of the miners, but, in some instances, there has been too little for even ordinary domestic uses.

The Nevada City *Transcript*, of recent date, says that the reservoirs for furnishing that town with water had been nearly empty for several days, to the great inconvenience of the inhabitants and the imminent exposure of the place to damage from fire; that journal, in a subsequent issue, proceeding to remark upon the extent to which hydraulic mining in that neighborhood is crippled through this same insufficient supply of water. Nor is this complaint confined to the town and vicinage above mentioned. It is general throughout the mining districts of the State. It comes to us from every quarter; it meets us wherever we go. It is instant and all-pervading, the expression of an urgent, universal want.

We made a flying trip last week to the interior, visiting some of the old mining camps and towns low down on the Mokelumne, near the boundary line between San Joaquin and Calaveras counties. These are dead places now—they died from want of water; supply them with this, and they would spring to life again, and not only regain their former prosperity, but perserve the tenure of their existence longer than before. Not only so; with water, new and flourishing camps would arise in localities where the diggings remain virgin, or have been but little exhausted, for this section of country abounds with such. It is true, the river bars and the gulches have been worked out. The more superficial deposits where water could be had have everywhere been considerably depleted. But there remain, right in this neighborhood, where mining was commenced at a very early day, and has since been actively continued, in so far as there has been water for carrying it on, heavy banks of rich gravel hardly yet touched; deep-lying beds of auriferous cement; old channels full of undisturbed wealth, with thousands of acres of shallow diggings easily worked, and sure to pay if only water were brought upon them.

Let it be observed, too, that we are speaking now of a comparatively obscure locality—of mines away down in the foothills, just on the lower edge of the main gold belt—of localities concerning which we hear but little now-a-days. Lancha Plana, Poverty Bar and Comanche were formerly famous mining camps, though not much is said about them of late. Still, there is a great extent of good mining ground at or near these places. The hills around them are full of gold, the diggings being often shallow and easily worked. What is known as the sand ridge, extending for six or eight miles along the south side of the Mokelumne, forming, in fact, the bank of that river, is composed wholly of gold-bearing gravel, that would pay enormously if worked by the hydraulic method with even a moderate amount of water. Some of this ground has well rewarded the labor of drifting, and a great deal of it would, no doubt, do so. Then there is Cat Camp, lying off a mile or two to the south, where a thousand men might earn for themselves fair wages, if they had water for piping. All through this region a multitude of men might find employment, or rather employ themselves, if this one great want could be supplied to them.

And not in the mines alone could an increased water supply be used here to advantage. There is a supurb farming country below them with an equally fine fruit-growing district all about them that stands much in need of increased irrigation facilities, their means in this respect being wholly inadequate to present, saying nothing of prospective requirements. It is hardly too much to say that the value of property throughout this entire region—that is, its productive capacities—would be enhanced fully 50% were it furnished with even a moderate supply of water.

From the prevailing dearth of this life-giving element, it would naturally be inferred that it was not to be had, certainly not within easy reach. And yet there is plenty of it; plenty, in fact, that, at a small cost, could be made practically available for every purpose. There is at this moment running to waste in the Mokelumne river 100,000 miners' inches of water, possibly twice that amount. It flows, as it ever has been suffered to flow, right through this spleudid region, so full of resources and possibilities, without any efforts having been made, or at least consummated, for its diversion and employment in the development of this natural wealth and the creation of new industries. An association was organized a few years ago, known as the Mokelumne Ditch and Irrigation Company, for the purpose of building a ditch, through which to introduce a portion of this water upon the farming and mining lands along the south side of the river; the scope of country intended to be covered by their operations reaching south to the Calaveras river and west to the tule land, the whole comprising an area of 300,000 acres. This company, which is made up of leading farmers residing in the district and some of the prominent business men of Stockton, having first secured a franchise to 100,000 miners' inches of the water flowing in the Mokelumne river, proceeded to construct a substantial dam across that stream; their expenditures to date for improvements made, right of way obtained, etc., amounting to something like $75,000 or $80,000. They are already now to commence building their ditch, for the accomplishment of which they require some pecuniary aid—$100,000 or thereabouts. As security for a loan to that amount they propose giving a lien upon their corporate properties and possessions, water privilege and right of way included, with such other guarantees as would make the loan absolutely safe. They want the money for a term of years and are willing to pay a fair but not an exorbitaut rate of interest, as they should not, in view of the unexceptionally good security they are able to give. The money could be obtained near home, but the rates of interest required are too high to meet the views of men engaged in such a legitimate and purely business-like enterprise, and the success of which they would not like to imperil by any unnecessary burdens. Besides, it is their purpose to furnish this water, when ready for delivery, to their patrons at the lowest possible rates; a policy that would hardly be feasible if they have themselves to pay usurious interest for the use of mouey to carry out their project. It seems to us that our home capitalists, and others having money to loan, ought to find in this offer of the compauy a good opening for placing some of their surplus funds. If there is on this coast any more valuable species of property than a water franchise like this, we have yet to learn what it is; or if there is any other class of improvements calculated to confer greater or more lasting benefits upon the entire community than the project here alluded to, we are alike ignorant of its character. Of all the enterprises that invite capital, these ditch schemes are the most beneficent and entirely safe. Our supreme want in California is a cheap and ample water supply. This need is an ever-present exigency—urgent and incessant. Our requirements in this directiou are many and multifarious, and they are constantly increasing. They grow with our growth and multiply with our population and new industries. We may be said to be forever suffering from drouth in some shape—a sort of perpetual water famine.

Let Our Miners Stop and Make Homes.

The epoch of the mining tramp has about passed away. The *stampede* has become a legend of the past. Those sweeping and impulsive movements that formerly carried the masses away to some far off locality—the more distant and difficult of access the better, have about subsided, or occur uow only in a mild aud subdued form. They were, for the most part, ill-advised and senseless even in their best days—these flighty movements of the multitude—seeing our mining districts present everywhere about an average amount of advantages, taken as a whole. Nothing tends to show this more conclusively than the fact that so many of our miners after leaving the sites of present labor, wherever they may have been, and going off after these reported "big things," find their way back after awhile to their starting point, satisfied there to remain; their acquaintance with the old diggings, and the home-like feeling that comes to them on getting back amoug former scenes and acquaintances, more than compensating for any advantages they could hope elsewhere to enjoy. It is, indeed, the case that there is so much in any and every part of the mining regions of this coast that ought to satisfy the man in pursuit of a pleasaut and remunerative field of labor to stop and be contented wherever his fortunes or enterprise may happen to cast him, that it is strange that any should fail to see the matter in that light.

Let the miner then tarry just where he is and there go to work cheerfully and resolutely, making the most of the opportunities around. Having secured a mine or some sort of interest in a mining property, let him next get hold of some land, the best within easy reach, and on it establish a house, improving it and gathering about him as many couveniences and comforts as possible. To this end fruit trees should be planted, a garden be cultivated, some land for grain-growiug he enclosed, a cow or two, some chickens, aud a team perhaps being added to his domestic establishment. If his means be limited, he has only to set to work at once, beginning in a small way, and he will himself be astonished at the rapidity with which he will get ahead. The most of the work required for accomplishing all this can be put in at odd spells, so that he will really loose very little valuable time in the end. In most parts of California there occur periods during the year when the miner cannot work his claim to advantage. In some localities this will be owing to the deep snow of winter, in others to the lack of water in the summer; the miner, through a variety of causes, having always more or less leisure for securing and improving a homestead. Let him be careful then to employ these spare hours in working for the end iudicated, for they will form not only very pleasant places of abode but also really valuable properties by and by—these little planted patches and rude homes in the mountains.

Now, while the old-fashioned craze that sufficed to empty the population of one locality suddenly into another, has so manifestly abated, it is still the case, that the average miner, when he reads in the papers (and he is a much reading man) about the big ore-finds reported here, there, and elsewhere, is apt to grow restive, and despite his past experience, itches to try his fortune once more in this new-found El Dorado; the chances being almost even that the evil one will put it into his head to roll up his blankets, lock the door of his cabin, and join the rush in search of this "Kidd's Treasure," wherever rumor may happen to have planted it. And thus it is that this class of men, loosing sight of the doctrine above enunciated, that one section of the mines is, ou an average, as good as another, and disregarding the truth of the old adage about the rolling stone, have generally remained poor in the midst of illimitable wealth, and restless though surrounded by the most splendid opportunities. It is time for them to wholly suppress this migratory spirit; stop where they are, make homes, cultivate a feeling of contentment and leave these outside opportunities, always so far off and generally so delusive, for another and less experienced class of adventurers.

The Camel on the Pacific Coast.

The first, and we believe the only lot of camels ever brought west of the Rocky mountains, was a herd of some dozen or more that arrived in Nevada from Texas, in 1861. They were originally brought out for the purpose of packing salt from Teel's marsh for the use of the Washoe silver mill. This marsh, then supposed to be the only saline in the State, is located in Esmeralda county, nearly 200 miles from Virginia City, the country between these points being dry, desert and sandy. As salt was an indispensable article in the reduction of these silver-bearing ores, the millmen had before this been compelled to import it at heavy cost from San Francisco. The introduction of the camel into the country for salt packing from a point so remote and difficult of access, was, as subsequent experience showed, a bit of good economy; the price of this commodity having, in consequence thereof, been reduced from a hundred dollars or more per ton to about one-third that amount. After a year or two a more abundant deposit of salt, and of a better quality, was discovered near Saud Springs, Churchill county, and distant from Virginia City only 75 miles, the most of the country to be traversed being favorable for wagon transportation. From this time on teams were employed for hauling in salt, and the use of the camels for this service having been superseded, these animals were turned adrift upon the deserts where they were left to shift for themselves, having afterwards been used only at intervals for packing to some distant and out-of-the-way mining camp, or other locality, not easily reached by wagons.

After this partial abandonment, these creatures, already terribly galled and broken down through overloading and bad usage, began to recuperate and increase, a number of young ones having been born during the next few years; and before they left the State, which it seems they afterwards did, having been driven to Arizona. We had lost sight of these "ships of the desert," not having, for a uumber of years, heard anything about them. It appears, however, as we gather from the Yuma *Sentinel* of Arizona, that they were some two years ago taken to that Territory, in the hope that they might there be profitably employed; as one would naturally expect would be the case, in view of the arid, barren and sandy character of the country to be traversed. But here again, as in Nevada, these "ships" seem to have been stranded on the reef of disappointment. Their owners could not make them pay, the teamsters, even in that arid and sterile region, being able to carry freights cheaper than they; wherefore the brutes were again turned out to shift for themselves, the owners having let them loose on the Gila eastward from Yuma, where they have been running unlooked-after ever since; and of course thriving and multiplying as is their wont when uncared-for by man. Nothing seems to suit the creature like being let alone. This is especially the case if the looking after is to come from the average Mexican or American, who have, seemingly, neither the patience nor judgment to deal with him properly. We well remember how shamefully these docile creatures were overtasked and maltreated in Nevada, some of them having died from their beatings and overburdens, and we are sorry to see that they have fared but little better in Arizona. The teamsters and packers there have been making targets of them on sight, the excuse for this inhumane practice being that they startle and even frighten by their ungainly appearance the horses, mules and donkeys of these worthy people. This is, of course, good reason for sending a bullet through the unsightly brutes whenever they are so careless as to make their appearance.

It is well now for these animals, especially the camel, that the railroad up the Gila carries everything beyond his present place of sojourn, thereby superseding the necessity for employing draft and pack animals along this part of the route, and, inferentially, also their drivers. It is to be hoped now that the hides of the inoffensive beasts will no longer be punctured by the deadly missel of the "bullwhacker" or the pilot of the "prairie schooner," but that they will be suffered to browse on the luxurious cactus and propagate in peace, their backs unchaffed by the galling pack, till such time as their services will be required on the sterile and waterless deserts of southeastern Arizona and the regions beyond.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

NON-CORRODIBLE MATERIAL FOR QUICKSILVER CONDENSERS.—H. H. Eamee, S. F.—Dated, January 28th.—In the separatiou of mercury from its ores, considerable quantitiee of sulphurous and sulphuric acids are produced, and these acids act with great energy upon iron condensers, so that in a short time they are rendered useless. This destructive actiou does not take placc in the first two or three of the condensers, as these are comparatively hot, but as the aqueous vapore condense, the action commences and thoy attack the iron with great energy. To remedy this difficulty, Mr. Eamce employs a material which will resist the attack of acide and other destructive subetauces, aud the condensers may either be constructed entirely of thie material or liued with the material; or it may be employed in the form of partitions or plates, either with or without perforatione to arrost the mercurial vapors. In soms cases it may bo found advisable to make a feundation of iron or other material, and thie foundation coated with the compound. By means of this compound, the inventor ferms a perfect rsisting surface to the action of acide and vapors, and a mercurial condenser ie made which is affective at the lower temperatures and where the aqueous vapors begin to condenso. It is easily constructed on ths spot and may be repaired without difficulty. Mr. Eames hae used this compound for some time with great success, and one of the large brick condeneers at the New Almaden mine has been lined with it recently and ie now in use.

INDICATING APPARATUS.—Hans Behr, Virginia City, Nev. Dated, Jan. 28th, 1879. Thie invention relates to that class of indicatore which are used in hoieting or winding engines to indicate to the engineer tho position of the cage in the shaft. A drum carrying a helix is mounted on a shaft operated by the main ehaft, on which the reel carrying the rope and cage is mounted, said helix having marks or numbers on it corresponding to the position of cage in shaft. The revolution of the shaft carrying drum and helix operates two screw shafts which carry an indicating bar and pointer, said bar and pointer moving in a plane in the direction of the axie of the drum and following the helix, so as to point out the poeition of the cage on the end of the rope in the main ehaft. This apparatus has recently been put in use on the Comstock, and we described it in detail a few weeke eince iu speaking of the machinery for the North Con. Virginia mine, which was made at the Union Iron Worke in this city. It ie the best improvement in this line yet devised.

ATTACHMENT FOR BOTTLE FASTENINGS.—Stephen Martinelli, Watsouville.—Dated, Jan. 28th. — This invention relates to a novel attachment to the faetenings of bottles, such as are employed to hold the corks in place where effervescing liquids are confined. These fastenings conoist of a curved metal cork, eo hinged at the sides of the bottle neck, as to swing over the cork to retain it in place after the bottle is filled, and they are pulled to one side when it is desired to remove the cork. It is often very difficult to remove these fastenings, as they become embedded in the cork by the internal preesure. This invention consists in the employment of a lever attachment to the link or fastening, so that the inventor is enabled to overcome any strain and remove the fastening at any time, with very little effort.

STEP LADDER.—E. W. Benjamin, S. F.—Dated, Jan. 28th.—Thie invention in etep ladders consiste in arranging a elide eo as to move in grooves on the supports or bracing standards; said slide being also euitably attached to the steps by means of arms, so that when the supporte are extended the arms hold the slide firmly, thue uniting the steps and the supports solidly together, and preventing any liability of the ladder ehutting up. A cord attached to the slide leade to a ring or pulley on the top of the step, by meane of which the slide may be moved up in its grooves, and the eupports or standard thus brought back againet the steps, leaving the ladder on a compact form when not in use.

JEWELRY.—Robt. W. Edwarde, S. F.—Dated, Jan. 28th.—This invention relates to certain improvements in jewelry, and it consists in a novel mothod of forming rings, pine, bracelets, earrings and similar articles, so that the ornamental eoal, brouch or pendant may be reversed to give a different front at pleasure with the same frame or ring.

JOHN O. WINSHIP, a lawyer, and Postmaster Sweet, of Windham, Oregou, have been sentenced each to $1,000 fine and oue year in the county jail for conspiring to defraud their creditore.

THE rafting of logs on Eel river thie winter has been attended with euccess.

The North Bloomfield Gravel Mining Co.

We have received the annual report to the stockholders, of the North Bloomfield Gravel Mining Co., with a statement of accounts from October 1872, to December 31st, 1878. The euperintendent of this company is Henry G. Perkins, and the general manager, Mr. Hamilton Smith, Jr., the well-known hydraulic mining engineer. The report is, like all previous ones of this company, prepared with the greatest care aud detail, and will serve as a model for mine reporte. There are a great many interesting facts in this report, from which we condense the following:

Washing was commenced at the North Bloomfield mine ou January 12th, 1878, and coutinued until October 10th, when the annual clean-up was made. After this clean-up only 40,000 iuches of water were used in November and December. In this report a miners' iuch is always assumed per a flow of 24 hours, being equivalent to a discharge of 2,230 cubic feet of water.

The following statement ehows the amounts of bulhon produced, and water used for 1870 to the closc of 1878:

Time.	Inches used.	Yield per inch.	Gross product.
1870–4	710,987	13.6	$ 96,700.00
1874–5	386.972	19.2	74,271.77
1775–6	700,000	27.5	192,735.73
1876–7	595,000	48.9	290,775.42
1877–8	796,449	39.1	311,276.70

During the past season more water was used and more bullion produced than for any previous year. The yield per iuch was 39 1-10 cents as against 48 9-10 cents in 1877. Thie diminution of yield has been chiefly due to the comparative poverty of the gravel channel worked last year. The maiu tunuel has been extended from No. 7 shaft about 1,300 feet and connected with the workings by shaft No. 9. A eluice has been placed iu this extension, and hereafter all the up-stream gravel will be washed through it. The coet of this extension and new shaft amounted iu 14 months to $27,896.

The tunnel was extended in nine months 1006 feet, with a section of nine feet square. Burleigh drills, driven by a Burleigh compressor, were used. The progress made averaged 112 feet per month at a cost of $24 per foot, includiug a full allowance for wear and tear of machinery and superintendence. Only one shift of drillers was employed; by increasing the nnmber of workmen, probably 175 feet would have been driven each month, at about the eame coet per foot. Previous to the uee of these drills, three shifts of miners in the same tunnel averaged a speed of 25 feet per month, at a cost of $27 per foot.

Up to this time about 10,000,000 cubic yards of gravel have been washed through the Bloomfield Tunnel over its natural or bedrock floor, but the resulting wear has iu no way impaired its usefnlness.

The coet per inch of water during the last season was a trifle over two and a half ceuts, or one-third less than for previoue years, and being at the rate of one cent for each ten-hour inch.

The Bowman reservoir dams have been finally completed, at a cost of $15,082; making a total cost of $96,640 as cost of enlargement from the old 72-foot level. These dams are very substantial, and compare favorably as regards stability with similar large structurcs in other parte of the world. The reservoir will now contain 907,000,000 cubic feet of water, or 410,000 24-hour inches.

The ditch and pipe conducting the waters of Texas creek into the main canal, four miles below the Bowman reservoir, have been completed at a total cost of $23,779. The pipe is an inverted syphon 4,400 feet long, 17 inches in diameter, made of riveted plate iron, with its inlet 310 feet above outlet, and enetaining a maximum preseure of 770 feet, or 334 pounds per square inch. It discharges about 1,250 miners' inches with the full head of 310 feet.

A telephone wire has been built along the line of the works, and is found of great convenience.

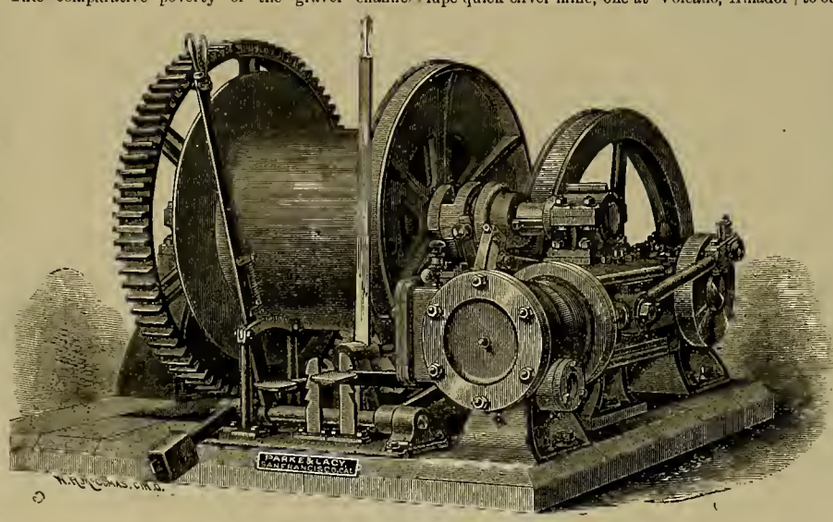
The Trustees, at the special request of the miners, decided to receive from them their surplus earnings, paying seven per cent. interest therson: the funde derived from this eource to be invested in the bonds of the company. Thie action was deemed advisable to inculcate saving habits in the workmen, and give them a personal interest in the company.

The completion of the Bowman dams and Texas creek pipe hae finally closed the construction account of the company. For eeme five years past a largo part of the earnings have been epent in thie way. The manager conceiders that the outlook for future profits are very favorable, ae a constant water supply is now assured for the entire year, except in very exceptionally dry seasons.

The tables accompanying this report show the expenees, etc., of the mine in the greatest detail, and are very carefully prepared. Items of mining cost, water cost, yield, profite, etc., are given in tables which show plainly the proportions of all with relation to each other.

An Improved Hoisting Engine.

Tho accompanying engraving represents the Niles improved hoisting engine for mining purposes. Theso engines are made double with single drum, double engines with double drum, and single engines with double drum, geared to suit requirements. They are made for surface or underground work, and to be run by steam or air. Messrs. Parke & Lacy, the agents, have put several of this type of hoists in operation in this State, one pair of 8x12 being at the Guadalupe quick silver mine, one at Volcano, Amador county, etc. These engines are very compact, and as the gearing ie all cut they are noiseless in running. The engraving shows a 10x12 engine. This engine will hoist 2,500 pounds 1,000 feet with 60 pounde of air.



THE NILES IMPROVED MINING HOIST ENGINE.

POSTAGE ON NEWSPAPER ARTICLES.—We never could quite understand why matter written for a book should be carried in the mail for one cent an ounce, while matter written for a newspaper should be charged six cents. The public certainly has more intereet in articles written for newspapers than for books, aud if any favor is to be shown it should be on the side in which the public bas the greatest interest. There is a chance that at least the discrimination against newspaper articles may be removed, for we read in the *Prairie Farmer* that a bill before Congress, introduced by Repreeentative Carlisle, of Kentucky, among other things, provides that hereafter all manuscripts intended for publication in, and mailed to the editor or publisher of, any newspaper or periodical, iesued at etated periode from a known office of publication, and all proof-sheets and corrected proof-sheets thereof, shall be included in mailable matter of the third class, and shall be charged poetage at the rate of one cent for each ounce or fraction thereof, provided the same be the production of the editors of the journale, or regular or authorized correspondents or contributors. It is to be hoped it will become a law.

MR. J. S. PHILLIPS the well-known mining engineer and author of Phillips' "Explorers' Miners' and Metallurgists' Companion," has removed his chemical laboratory and general mining offices to No. 702 California etreet, where he is prepared to give practical instructions on mineral analysis, assaying, and the general subjects of mining and metallurgy. Mr. Phillips has been a practical operator for many years, and is now much better fitted than ever for giving instructioue on the various branches. Testing and assaying are taught to prospectors for especial mountain requirements.

Vulcan Blasting Powder.

This is the name of a blasting powder well and favorably known on this coast. Until recently it was manufactured by Messrs. R. W Warren & Co., but this firm has now been succeeded by the Vulcan Powder Co., office 123 California street, in this city. The company owns two worke. The first erected about four years ago near Reno, Nevada. This is the smaller of the two, covering about five acres. The number of men employed is 15; the motive power, water; capacity about one ten of powder per day. The eecond worke were built about six months ago near San Pablo, Cal. These latter works are complete in every particular, and at their fullest capacity can turn out ten tons of powder per day. The company here owns a tract of 250 acres, 12 of which are covered by the mills, sheds and other buildings necessary in the manufacture of the powder; 20 to 30 men are constantly employed. Steam power alone is used as a motor. No eporting powder turned out, the company confining itself strictly to the manufacture of mining powders. Vulcan powdor, when ready for market, is in the form of cartridges, varying from ⅝ inch to 1¼ inches in diameter, and from 4 to 8 inches in length. It is packed in cases of 10, 25, 50, and 100 pounds.

Vulcan powder ie of three grades: Nos. 1, 2 and 3. No. I, is claimed to be the strongeet powder in uee, its streugth equalling that of liquid nitro-glyceriue. No. 2, is said to be so strong that, except in the hardest rock, it answers every purpose. No. 3, ie a slower powder than the other two, and more adapted to outside work and quarrying. These powders are a compoeition of nitro-glycerine and other explosives, which latter act as absorbant, consequeutly there being no inert matter, as in other "high explosives," every particle of it exert explosive force, not an iota of power being loet. Another advantage claimed, is that the materiale ueed in ite compositiou, being all decomposed by its explosion, nothing is left to float through the mine where the men have to breathe, and consequently inhale the dust, as is said to bo the case wheu a non-explosive absorbant is used in the manufacture of a mining powder. Ae the emoke from Vulcan powder passes off quickly, the minere can soon after a blaet resume work, thus saving time and expenso.

As an indicatiou of its high reputation, we are informed that it is wae given the preference over all other high explosives, by the U. S. Engineering department at New York, in the "Hell Gate" excavations. On thie coast it ie largly used in prominent mines in California, Nevada, Montana, Idaho, Utah, Arizoua, Mexico, etc., etc., also in important railroad works, and wherever a blaeting powder ie required.

Iu the new company, prominent mining men are interested, and thoroughly understanding the wants of the mining community, we have no doubt that Vulcan powder will, in the future, add to its already good reputation, as a strong, safe, uniform and reliable explosive. The officers of the company are: Hamilton Smith, Jr., President; Ralph L. Shainwald, Secretary; R. W. Warren, Manager. Directors—Hamilton Smith, Jr., R. W. Warren, L. L. Robinson, J. Baum and J. P. Pierce. Office, 123 California etreet.

Dangerous Things (?)

The echoes of the Giant powder explosion have not yet ceased reverberating it seems, though it is only in the fainter form of nerve tremore by the interested public, or, perhaps, of pen throbs by those who do the writing for them. "Box" takes one of the latter to task as followe:

EDITORS PRESS:—A correspondent of the *Morning Call* has written a long article upon deadly poisons and explosions, wherein he (or she) etates that "cyanide of potassium" is so dangerously destructive to life that merely sprinkling a eore or tasting it would cause death in a few minutes; and that there is a fulminate of gold with such amazing strength that even a small pill-box would contain sufficient to destroy "all London, or the largest army." Beware! for it is as dangerous to write upon a subject you do not understand as it is to handle deadly druge. Box.

S. F., Jan. 23d, 1879.

A STRONG company has been organized for introducing a large amount of water from the Mokolumne river upon the farming lands lying between that stream and the Calaveras.

QUITE a severe earthquake shock was felt in Visalia Monday night about 12 o'clock.

HAY ie eelling in the fields near Bakersfield at $4 per ton.

FOREIGN PATENTS

FOR PACIFIC STATES INVENTORS

ARE SECURED IN MUCH LESS TIME,

—BY—

DEWEY & CO.,

AT THE OFFICE OF THE

Mining and Scientific Press,

THAN THROUGH ANY OTHER AGENCY.

Established in 1860,

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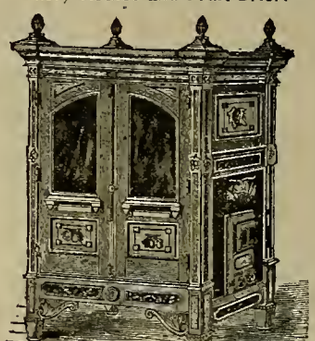

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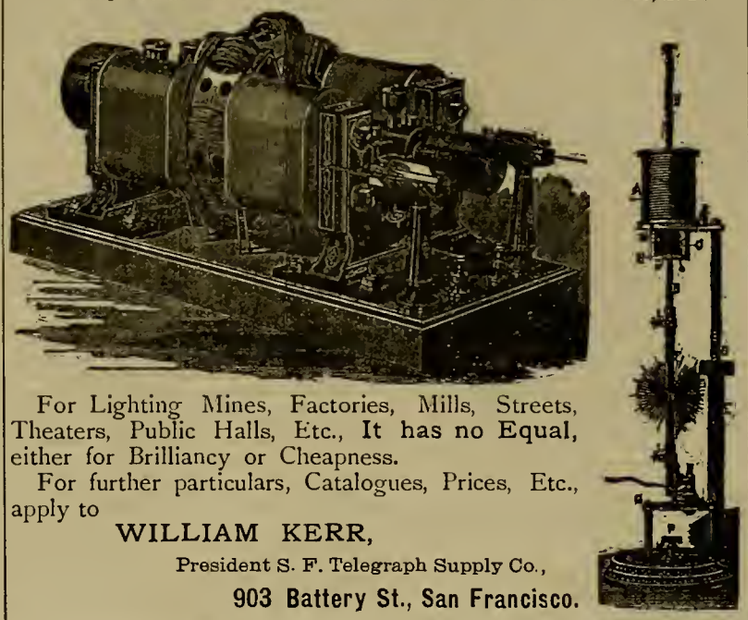

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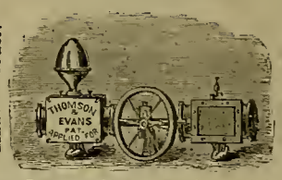

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Continued from Page 101.

level, but little advance has been made owiug to a necessity for timbering. The daily yield of ore is gradually lessening, and the bullion returns for the present month ars not likely to reach the amount of the proceeds of January.

Con. Virginia.—The ore stopes on the 1500 and 1400 levels are lookiug well, and there is a steady increase in the amount of ore extracted. Sinking the C. & C. shaft is going forward at the rate of 2½ feet per day. The joint west crosscut on the 1950 level is still advancing in favorable ledge material.

Yellow Jacket.—The connection between the new shaft and the 2200 level of the old works having been made last Friday, a station is being cut out at that point. This station is the 2280 of the new shaft, the difference between the surface level of this shaft and the old one being about 80 feet. When the 2280 station of the new shaft is completed, all future hoisting of water, rock or ore will be done through it, instead of the old shaft and the Crown Point as heretofore.

Ophir.—The daily yield of ore is about 80 tons. The yield of bullion for the present month is several thousand dollars ahead of what it was at the same date in January, showing a steady iucrease in the milling valne. The ore stopes from the 1900 down to the 2000 levels are yielding rich ores. The bullion yield for January was in round numbers $191,000.

Alta.—Sinking a large, double-compartment joint shaft or winze below the 1550 level on the dividing line between the Alta and the Benton, has been commenced, and is making good headway.

Julia Con.—The breakage of the pump-bob has again delayed the drainiug of the water from the 2000 level. The south branch of the Sutro Tunnel, which passes a distance of 20 feet east of the shaft, nine feet below the 1600 station, is rapidly nearing the main shaft. A drift has beeu started east from the shaft to connect with it.

Bullion.—The north drift on the 2400 level is making excellent progress, the face in a soft, lively character of vein matter, showing streaks of fine looking quartz giving low assays, along with a slight seepage of water.

Lady Bryan.—During the first part of the week a fine vein of handsome looking quartz was struck in the bottom of the main shaft while sinking.

Crown Point.—The air connection with the joiut pump shaft was completed on Saturday morning last. This thoroughly ventilates the mine down to that depth.

Consolidated Imperial.—The recent counection of the Yellow Jacket shaft with the 2200 level, which corresponds with the 2400 level of the Imperial, has already greatly benefited the air circulation of the mine.

Belcher.—The north drift on the 2560 level has connected with the south drift from the Crown Point on the 2500 level, affording a splendid circulation of good air and greatly facilitating the work in that portion of the miue.

North Consolidated Virginia.—The big shaft 26½ feet in leugth and 22 inches in diameter, arrived yesterday, and is being placed in position ready for service.

Savage.—The east crosscut, on the 2100 level, has been steadily advanced during the week and is now in 371 feet.

Sutro Tunnel.—The south lateral branch will connect with the Julia shaft in the 20-foot drift the comiug week, a very important connection, giving not only a much needed air circulation, but an outlet for the water which is bulldosing the lower levels of the Julia. No definite or satisfactory understanding has been as yet arrived at between the main Comstock mining companies and Sutro, consequeutly the big tunnel is not made available just yet for hot water drainage.

Leviathan.—Twenty-two feet has been added to the length of the main north lateral drift on the 730 level. The face of the drift is in clay, quartz and porphyry, of a very promising character.

Best & Belcher.—Sinking the Osbiston shaft is making good progress, taking into consideration the strong flow of water. The joint east drift, on the 1700 level, is now in 486 feet.

Trojan.—The south drift from the west drift on the second etation level is in 45 feet, the face in quartz and porphyry, assaying from $10 to $15 per ton.

Utah.—The new hoisting engines are ready to start up. The standing pumps are placed in position ready for service in the main incline.

Hale & Norcross.—Siuking the winze to conuect the 2100 and 2000 levels is making good progress.

Mexican.—The north drift on the 2000 level is steadily advancing, the face in hard, black porphyry. It is now in 380 feet. The joint Union Con. winze below the 1600 level is now down 221 feet.

Silver Hill.—The east crosscut on the 1100 level is steadily advancing, the face in dry, hard porphyry showing streaks of clay.

Caledonia.—Sinking the double perpendicular winze below the 1600 level is going vigorously forward, the bottom in rock that blasts out well.

Justice.—The Pappoose mill is kept steadily running on reserve of ore from the mine.

Union Con.—Sinking the joint Mexican below the 1600 level is making the best of headway considering the extreme hard character of the rock penetrated.

Ward.—The erectiou of the new hoisting machinery is making the best of progress.

Overman.—The north drift on the 1600 level is making good progress; the face still in quartz and vein matter.

Gould & Curry.—Sinking the Osbiston shaft is making good progress considering the trouble caused by the strong flow of water. Repairing the main shaft is making good headway.

Chollar-Combination Shaft.—Sinking the main shaft below the 2250 level is making steady progress. The flow of water at the bottom is still quite strong. The new air compressor will soon be ready to start up.

EUREKA DISTRICT.

Mining Notes.—*Sentinel*, Feb. 8: In our weekly rounds on Ruby Hill, we droppsd into the Eureka Consolidated mines on Tuesday last, where we found everything moving along in the accustomed manner. There is some prospecting work being done on the fifth level, where they have some ors. On ths ssventh and eighth levels, and more particularly ths latter, thers are immense bodies of high grade ore, in which the black metal predominates. It will require a long time to exhaust the ore between thess two levels, which as yet sesms hardly to have been touched. The ors on the eighth level is the richest that has been found in the mine, and, we think, will prove to hs the largest body yet discovered. However, there is but little known of the extent of the ore bodies in this company's mines, as not one-half of their ground has been prospected, and the probabilities are, that in two years hence the property will be much more valuable than it is to-day. One fact has already been proven, that as depth is attained in this mine the ore becomes richer in gold. At the present time one-half of tbe yield from the furnaces is gold. A new tunnel, to be called the Morgan, is about to be started on the west side of Prospect mountain, immediately between the Charter and Prospect mountain tunnels, and running parallel with them. It will cut the Mary Anu, Ozark, Elizabeth, Lady Hull, Erie and other prominent and valuable mines in the mountain. The Phenix is working a force of 30 men. Incline 140 feet. The Jackson continuee to send forth its full quota of ore. Capt. Adam's Silver Lick mine is showing up splendidly. The Mountain Boy, is being worked on a lease by some Frenchmen. Reported doing well. Zinc ore is being taken from the Lizette tunnel. It comes from the old workings of the Richmond minc.

PARADISE DISTRICT.

Credit Mobilier.—*Silver State*, Feb. 1: This mine has been bonded by its owner, A. M. Sadorus, to a Sacramento company. It is situated near R. H. Scott's ranch, in the range of mountains which divide Paradise and Eden valleys. It has been prospected by its discoverer and owner by a shaft to a depth of 60 or 70 feet, and carries the richest gold bearing quartz of auy mine yet found in this part of the country.

Paradise Company.—No dividends as yet. New property, only five months since its discovery; has developed in a most remarkable manner considering the short time the company has been at work upon it. Over $30,000 have already been expended in opening the miue, with, as before mentioned, very remarkable results, for the mine is already producing from 10 to 15 tons of ore per day that assays from $200 to $300 per ton, and thie out-put of ore comes from the drifts being run without any stoping being done. The company is about starting the Rye Patch custom mill, and will not build one of its own until next summer. That this mine will soon be on the dividend list, there is not a question of doubt. There is very little stock for sale, and that finds a ready market at from $2.00 to $2.50 per share.

Bullion.—The Bullion mine is developing finely. The ledge is said to be 20 feet wide, and the ore hody the largest and richest yet found in the district. A part of the Bullion mine has been bonded by Capt. Rawlings of Virginia, who has a force of men employed prospecting it.

REESE RIVER DISTRICT.

Western Nye.—*Reveille*, Feb. 8: The Alexander mill ie now running again with renewed vigor, all necessary repairs having been made. They will ship the usual amount of bullion tomorrow. A new ore dump and railroad track ie being erected near the entrance to the eouth tunnel. The mine continuee to yield large quantities of rich ore, with no new developments to report. The stock recently ran down from $11 to $2, without any apparent cause, as the company's affairs are in good shape, and producing coneiderable bullion, and with their new mill an increase of bullion ehipments may be expected. Within a period of four daye the stock advanced to $6½, the latest quotations received. The furnace at Downeyville etarted up on 25th ult., but the jacket sprung a leak and had to be shut down for repairs; however, it started up again on the 1st. The mines are looking about as well as at any time heretofore. Ou Tuesday morning they shipped several tons of bullion. A ledge has been discovered, three miles from Dowueyville, the croppings of which assay $120.

Manhattan.—During the 24 days that the mill was run in the month of January there was reduced 490½ tons of ore, the assay value of which is $80,959.60; of this amount $21,288.84 was from custom ores; $5,517.27 from tribute mines and $54,333.50 from the Frost and Curtie shafts.

TRINITY DISTRICT.

Numa Co.—*Silver State*, Feb. 8: This San Francisco corporation, have a force of miners employed on the Evening Star mine, eight miles west of Oreana. The mine is said to be looking well and yielding considerable rich ors. The Eveniug Star was worked extensively in the early days of this county, and produced sufficient ore to run an eight stamp mill steadily until water was encountered in the mine, which caused a suspension of operations, and resulted in the desertion of the district. The mill, which was built by ths Evening Star company, was removed from the district, and for years the place was abandoned. One or two of the old owners worked assessments on the mine every year and obtained a patent for it, and some time since incorporated under the name of the Numa company. A lot of ore from the mine will soon be worked at the Hope mill, and the prospects are so encouraging that the working force on the mine has been increased.

ARIZONA.

Globe District.—*Silver Belt*, Feb. 7: Meek & Anderson are arastring El Capitan ors. Thomas Kirvin, on leased ground, has developed rich ore. Good ore is reported struck in the Peacock claim. Several tons of good ore have been sent from the Reseue mine to the Miami mill. The shaft on the Alice mine is now down 90 feet, and in three feet of carbonats ore. The Metamora company is likely to put hoisting works on that miue. Tbe shaft is now about 150 feet deep. Work is being done on the Elephant claim, north of Black peak. The Miami company has started to crush ore. Fifty tons are in the mill. The Queen mins ehows well-defined walls, and good ore ie in sight. Shaft down 40 feet. On Wednesday last a large body of rich ore wae struck in the Stonewall Jackson. Its estimated value is $1,000 per ton. Machinery passed through thie place last Tuesday for the concentrators now in the course of erection at the Wheatfields. The Mattie West, extension of the Belgium, is prospecting well. Some of the ore has assayed 346 ounces. It belongs to Lieurance Bros. & Co. George Weher, who was prospecting a blind lead, discovered promising ore.

IDAHO.

Silver City Notes.—*Star*, Feb. 4: At the Black Jack mine work is progressing. Considerable is being done in the way of prospecting and putting the mine in shape for work the coming season. Large ehipments of ore are daily heing made to the mill. The ledge is looking unusually well, and is yielding the regular supply of rich ore. The mill is running to its full capacity, with prospect of the necessary water supply for the winter months. The mine on Florida mountain is turning out first-class rock. The ledge is eight feet wide, and the rock now being crushed at the Leonard mill will yield somewhere in the vicinity of $70 to the ton. The Potosi is looking well. The mine has been producing a good supply of ore during the past few weeks, averaging nearly $50 to the ton. There are some 20 men employed. The Morning Star mine has been put in condition foi active operations, and the work of taking out rock will commence in a few days. The Mahogany mine and works have been sold at Sheriff's sale for $10,000.

News in Brief.

The thermometer at Salt Lake has touched zero.

California lions kill many pigs in Butte county.

Two high Turkish officials have proved incorruptible.

Stockton hae admitted colored pupils to the white schools.

One hundred and one deaths occurred in this city last week.

Fresno county has a 12-year-old boy who stands six feet two inches.

Several mines on the Comstock lode have been attached by creditors.

A man was lately killed in Philadelphia by the explosion of a beer barrel.

An embargo has been laid on the importation of American cattle into Canada.

At Drytown a lady named Mrs. Spooner committed suicide by hanging.

A fatal horse disease prevails about Newberg, Yamhill county, Oregon.

Passenger travel over the Central Pacific railroad ie very ligbt at present.

Passanante, who attempted to kill the King of Italy, has been pronounced sane.

R. L. Ryan fell down the shaft of the Bodie mine on the 6th inst. and was killed.

Queen Victoria is about to become a great-grandmother, and not yet 60 years old.

Napa City is to have a pottery which will be in operation in the course of a few weeks.

A Montana snow-slide lately swept away an ore-shed, killing three men and six horses.

The St. Gotbard tunnel is now 13,481 feet long, being the longest tunnel in the world.

The Tulare foothille are covered with green grass, but it is not yet long enough for feed.

The Sandwich Islands are likely to become a place of refuge for Chinamen leaving California.

The city of Memphis has suppressed her charter as a corporation, to avoid paying her debts.

There is estimated to be 4,500,000 barrele of petroleum in the tanks in the oil region of Pennsylvania.

No more silver five-cent pieces will probably be coined, and their place ie to be filled by nickles.

There are at Cheyenne 3,000,000 pounds of boilers and machinery awaiting shipment to the Black Hills.

A new "Municipal Reform" party has been started in San Francisco. It is non-partisan and purely local.

The value of real estate and improvements in Napa county is $6,818,390, and of personal property $1,297,951.

Revised returns of the production of wine in Napa county in 1878, show that 2,100,000 gallons were made.

About 20,000 buildings, costing over $280,000,000, have been erected in New York during ths past 11 years.

Dakota has an army of immigration agents working Iowa and other States in the interest of that Territory.

The Southern Pacific railroad employs in Arizona 1,200 laborers—1,000 Chinamen and 200 white men.

In view of the late Supreme Court polygamy decision, the Mormons have entered a protest and taken more wives.

Measures for preventiug the spread of the plagus have becn, or are about to be, taken by every nation in Europe.

The uames of a number of naturalized citizens have been stricken from the great rsgister on the ground of fraud.

The buds of almond and cherry trees in the vicinity of Marysville, California, ars nearly ready to burst into blossom.

Three children in Sutter county came nsar being fatally poisoned by chewing the inside bark of the black locust tree.

Durino January the grain shipmsnt from the Salinas depot of the Southern Pacific railroad amounted to 631,284 pounds.

A lady named Davenport was thrown from a buggy at Visalia and received injuries from which she died the same day.

A party of Tehama bear hunters killed three grizzleys last week. The largest weighed between 800 and 900 pounds.

Orange, Los Angeles county has been experiencing the visite of horse thieves. Five were stolen on Friday night last.

According to judicial investigations recently had in San Francisco, the price of Chinese women ranges here from $100 to $700.

The last survivor of the Lewis and Clarke expedition, a colored man, aged nearly 90 years, was frozen to death lately iu Virginia.

Coyotes are killing a large number of eheep in Tehama county. The withdrawal of the scalp bounty is pronounced an injustice.

Miss Tortillot lately walked 48 hours in Stocktou without food, drink or rest. What useful things she is able to do is not stated.

Michael Hall, a stout young Irisbman, on a wager, drank a quart of whisky at one draft in Sutro, Nevada, last week, fell down in a stupor, was taken to his lodgings and dicd.

A man lately fell into the water in the lower levels of one of the Comstock mines and was scalded to death. This water was heated to a fatal temperature wholly by natural causes.

The amount of counterfeit coin in circulation in the United States is said to be $2,000,000, besides the great number of genuine pieces made fraudulent by the removal of part of the metal.

While the Irish will celebrate St. Patrick's day in this city, a uumber of organizations will decline to march in the procession, preferring to observe the anniversary in some less ostentatious manner.

John Timmerman was found dead in the road ten miles from Wickenburg, Arizona, recently. He was ehot in the side, and is supposed to have been murdered for his money, as he had some $700 on his person.

A letter from Dublin states that while in Ireland Gen. Grant wae constantly ehadowed by a Dublin detective, who expected to discover evidence that Gen. Grant was the Fenian headceuter of the United States.

Our Eastern Agency.

We have established a special Eastern Agency for the Press at No. 38 University Place, New York City, with MR. JOHN MICHELS. He will correspond for our columns, and also receive subscriptions, advertisements, etc., for the accommodation of our Eastern friends.

Fresh attractions are coustantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Artesian Wells Wanted.—Parties who are prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of the Reading Ranch, Anderson, Shasta County, Cal.

Settlers and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Examine the accelcrative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Henry R. Ewald is our general correspondent and agent for Arizona.

Chew Jackson's Best Sweet Navy Tobacco.

GENERAL MERCHANDISE.

[WHOLESALE]

WEDNESDAY M., February 12, 1879.

BAGS—Jobbing.

Reg Standard Wheat..9 @ 9½
Nevills & Co.
Hand Sewed, 22x36..9 @ 9½
24x36..—@—
22x40..11 @—
Machine Swd, 22x36..9 @ 9½
Flour Sacks, halves..8½@10
Quarters..5½@ 6½
Eighths..3½@ 4
Hessian, 60 inch..13 @14
45 inch..8½@ 9
40 inch..7½@ 8
Wool Sacks,
Hand Sewed, 3½ lb..46 @50
4 lb do..50 @52½
Machine Sewed..45 @—
Standard Gunnies..13½@14
Bean Bags..7 @ 7½

CANDLES.

Crystal Wax..17 @—
Eagle..12 @—
Patent Sperm..30@—

CANNED GOODS.

Assorted Pie Fruits
2½ lb cans..2 00 @ —
Table do..3 00 @ —
Jams and Jellies..3 50 @ —
Pickles, hf gal..3 15 @ —
Sardines, qr box..1 67½@1 90
Hf Boxes..2 50 @2 75
Preserved Beef,
2 lb. doz..4 00 @ —
do Beef, 4 lb, doz..6 50 @ —
Preserved Mutton,
2 lb. doz..4 00 @ —
Beef Tongue..6 50 @ —
Preserved Ham,
2 lb. doz..6 50 @ —
Deviled Ham, 1 lb,
doz..5 50 @ —
de Ham, ½lb doz..3 00 @ —

COAL—Jobbing.

Australian, ton..8 00 @— —
Coos Bay..6 50 @ 7 00
Bellingham Bay..6 50 @— —
Seattle..6 00 @ 6 50
Cumberland..14 00 @— —
Mt Diablo..4 75 @ 8 00
Lehigh..13 50 @— —
Liverpool..7 50 @ 8 00
West Hartley..10 50 @— —
Scotch..10 50 @— —
Scranton..11 50 @— —
Vancouver Id..7 00 @— —
Charcoal, sack..75 @— —
Coke, bbl..60 @— —

COFFEE.

Sandwich Id, lb..— @— —
Costa Rica..15 @ 16
Guatemala..15 @ 16
Java..23 @— 26
Manila..17 @— —
Ground, in cs..25 @— —

FISH.

Sac'o Dry Cod..4½@ 5½
do in cases..— @ 6
Eastern Cod..— @— —
Salmon, bbls..8 00 @ 9 00
Hf bbls..5 00 @ 5 50
1 lb cans..1 40 @ 1 45
Pkld Cod, bbls..12 00 @— —
Hf bbls..11 00 @— —
Mackerel, No. 1.
Hf Bbls..9 50 @10 50
In Kits..1 85 @ 2 10
Ex Mess..3 25 @— —
Pkld Herring, bx..3 00 @ 3 50
Boston Smkd H'g..70 @— —

LIME, Etc.

Lime, Sta Cruz, bbl..I 25 @ 1 50
Cement, Rosendale..2 00 @ 2 25
Portland..4 00 @— —
Plaster, Golden Gate Mills..3 00 @ 3 25
Land Plaster, in bbl..10 00 @12 50

NAILS.

Assted sizes, keg..2 50 @ 3 00

OILS.

Pacific Glue Co's
Neatsfoot, No 1..1 00 @ 90
Castor, No 1..1 10 @— —
do, No. 2..1 06 @— —
Baker's A A..1 25 @1 30
Olive, Flagniel..5 25 @5 75
Possel..4 75 @5 25
Palm, lb..9 @— —
Linseed, Raw, bbl..72 @— —
Boiled..75 @— —
Cocoanut..55 @— —
China nut, cs..70 @— 72½
Sperm..1 40 @— —
Coast Whales..40 @— —
Polar..45 @— —
Lard..90 @1 00
Oleophine..22 @— 23½
Device Brill'..22 @— 23½
Photolite..— @— —
Nonpariel..31 @— 32½
Eureka..18 @— 42½
Barrel kerosene..20 @— —
Downer Ker..37½@— —
Elaine..37½@— —

PAINTS.

Pure White Lead..8 @ 8½
Whiting..1½@— —
Putty..4 @ 5
Chalk..1½@— —
Paris White..2½@— —
Ochre..3½@— —
Venetian Red..3½@— —
Averill Mixed Paint, gal.
White & tints..2 00 @2 40
Green, Blue
Ch Yellow..3 00 @3 50
Light Red..3 00 @3 50
Metallic Roof..1 30 @1 60

RICE.

China, Mixed, lb..5 @ 5½
Hawaiian..7 @ 7½

SALT.

Cal. Bay, ton..15 00 @22 50
Common..10 00 @12 00
Carmen Id..12 00 @14 00
Liverpool fine..19 00 @— —

SOAP.

Castile, lb..10 @ 10½
Common brands..4½@ 6
Fancy brands..7 @ 8

SPICES.

Cloves, lb..45 @ 50
Cassia..22½@ 25
Nutmegs..85 @ 90
Pepper Grain..15 @ 17
Pimento..15 @ 16
Mustard,
½ lb glass..1 50 @ —

SUGAR, ETC.

Cal. Cube, lb..11½@— —
Powdered..11½@— —
Fine crushed..11½@— —
Granulated..11 @— —
Golden C..9½@— —
Cal. Syrup, kgs..70 @— —
Hawaiian Molasses..26 @ 30

TEA.

Young Hyson, Moyune, etc..27 @ 30
Country pkd Gunpowder & Imperial..50 @ 60
Hyson..30 @ 35
Fooo-Chow O..35 @— —
Japan, 1st quality..40 @— —
2d quality..20 @ 25

METALS.

(WHOLESALE.

WEDNESDAY M., February 12, 1878.

IRON.—
American Pig, soft, ton..23 00 @26 00
Scotch Pig, ton..25 50 @26 50
American White Pig, ton..23 00 @— —
Oregon Pig, ton..26 50 @— —
Refined Bar..2½@— 3
Horse Shoes, keg..5 00 @— —
Nail Rod..—@— 7½
Norway, according to thickness..6½@— 7
COPPER.—
Sheathing, lb..34 @ 35
Sheathing, Yellow..19 @ 29
Sheathing, Old Yellow..— @—
STEEL.—
English Cast, lb..16 @ 17
Black Diamond, ordinary sizes..16 @— —
Drill..16 @ 17
Flat Bar..16 @ 19
Plow Steel..8 @ 12½
TIN PLATES.—
10x14 I O Charcoal..8½@ 9
10x14 I C Coke..7 @ 7½
Banca Tin..18 @— 20
Australian..15½@ 17
ZINC.—
By the Cask..9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask..9½@— 10
NAILS.—
Assorted sizes..2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, February 12, 3 P. M.

SILVER 2½@2¾. GOLD in New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@20 ₱ cent. discount.
EXCHANGE on New York, 25, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 87½@89.
LONDON Consols, 96 5-16; Bonds, 104 3-7.
QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending February 11, 1879.

HIGHEST AND LOWEST BAROMETER.

Feb 5	Feb 6	Feb 7	Feb 8	Feb 9	Feb 10	Feb 11
30.156	30.145	30.196	30.077	30.067	30.243	30.179
30.099	30.055	30.070	29.069	29.011	30.148	30.089

MAXIMUM AND MINIMUM THERMOMETER.

50.5	55.5	56	59	59	60	61.8
43.5	43.5	46.6	50.7	52	50.5	55

MEAN DAILY HUMIDITY.

77.7	72.7	71.6	72	93.3	78.6	87.6

PREVAILING WIND.

N	SW	SW	SE	SE	SE	SE

WIND—MILES TRAVELED.

129	134	220	237	358	102	143

STATE OF WEATHER.

Clear.	Clear.	Fair.	Cloudy	Rainy	Cloudy	Rainy

RAINFALL IN TWENTY-FOOR HOORS.

		.10	1.66	.11	.78	

Total rain during the season, from July 1, 1878, 9.15 in.

Cheerfully Recommended.

CHEROREE, Sept. 8th, 1878.

DEWEY & CO.—*Gentlemen:*—Having received my Letters Patent for improvement in vehicle wheels, I consider it a duty I owe your firm to tender my sincere thanks for the interest and pains you have taken in the prosecution of the case. I shall cheerfully recommend your firm to such as may need your services. I remain yours,

Very Respectfully, WM. THUNEN.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco. Location of works, Cherokee Flat, Butte County, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 40), levied on the 20th day of December, 1878, the several amounts set opposite the names of the respective shareholders, as follows:

	No. Certificate.	No. Shares.	Amt.
A. Cassell	17	4608	$230 40
L. Nussbaum	105	50	2 50
E. I Pfeiffer	106	430	21 50

And in accordance with law, and an order of the Board of Directors, made on the 20th day of December, 1878, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, on Tuesday, the 18th day of February, 1879, at the hour of two o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, No. 318 Pine Street, Room 6.

Griffith Consolidated Mill and Mining Com-

pany.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 21st day of January, 1879 an assessment (No. 1) of twenty cents (20c) per share was levied upon the Capital Stock of the Corporation, payable immediately to the Secretary, at the Office of the Company, Room 48, 330 Pine Street, San Francisco, California.

Any Stock upon which this Assessment shall remain unpaid on the 26th day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, March 26th, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees.

GEO. M. CONDEE, Sec'y.

Office, Room 48, 330 Pine Street, San Francisco, California.

Office Wide Awake Prospecting and Min-

ing Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

Summit Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fourth day of February, A. D., 1879, an assessment (No. 7) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the eleventh (11th) day of March, A. D., 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the eighth day of April, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

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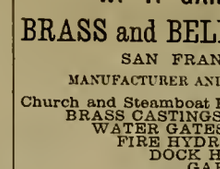

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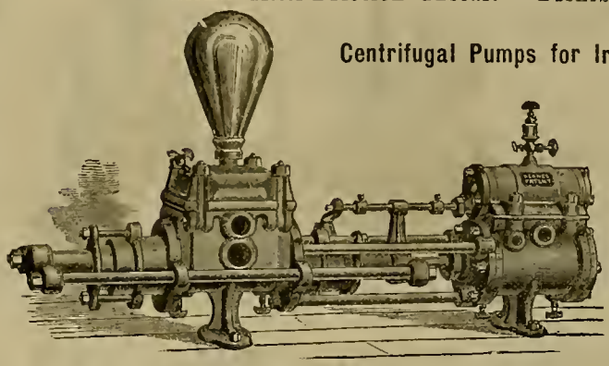

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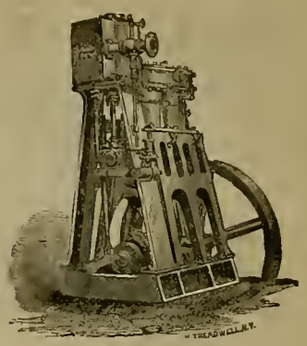

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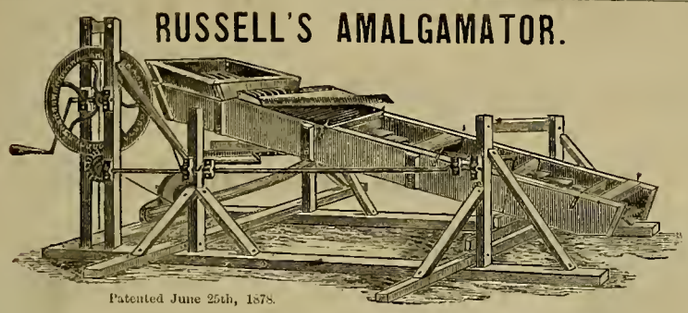

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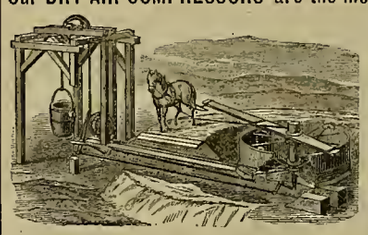

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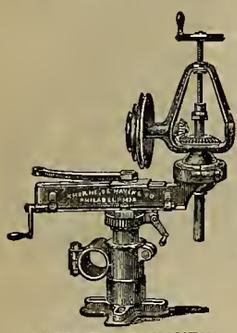

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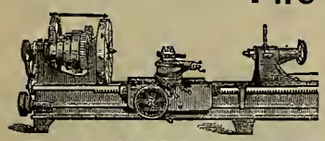

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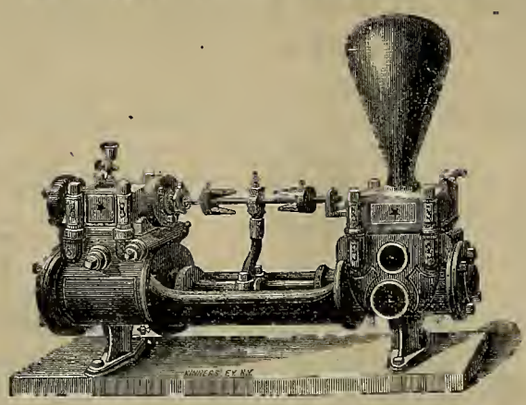

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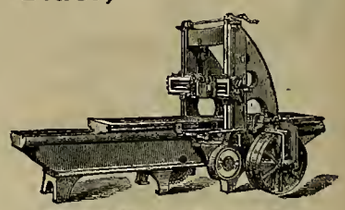

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Stronger, Better and Safer than any other High Explosive.

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

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BANDMANN, NIELSEN & CO., San Francisco.

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Never one has Failed.

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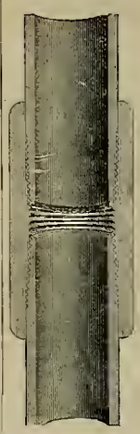

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, FEBRUARY 22, 1879. VOLUME XXXVIII Number 8.

A New Safety Powder.

The Safety Powder Company is an incorporation recently organized in this city for the manufacture of new explosives for mining and engineering purposes, which are claimed to possess certain characteristics, indicated by its name, in a greater degree than has been considered possible in high explosives. This result is reached by so making the powder that it will not explode except under *three* conditions, which conditions are those which ensure the greatest safety, and are also those under which powder is used. For instance, other powders are made, which are not supposed to explode, except under the conditions of heat and percussion both applied at the same instant, but will explode in the open air when these conditions are fulfilled. The powder in question is so made as to explode only by heat, percussion and confinement, which three conditions must be fulfilled before its explosive qualities will appear. That is to say, it must be fired by a proper fuse and cap and be tamped down, otherwise no explosion will occur. If therefore a cap were fired in the powder in the usual way, provided the cartridge was not tamped and powder closely confined, no explosion would follow.

This statement may appear somewhat strange to those accustomed to use high explosives, but as far as a few simple experiments will prove, is borne out by the facts. We visited the works of the company on the corner of Greenwich and Octavia one day last week, and witnessed a series of experiments with the powder, some account of which may be of interest to our mining friends.

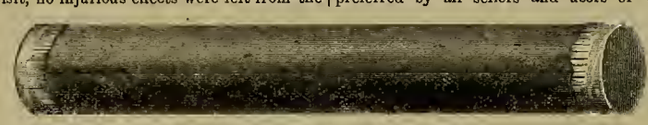
In the first place it may be stated that this compound contains no nitro-glycerine whatever, an invariable explosive chemical ingredient being one of the salts of potash, to which are added other substances, some of which are necessary to the evolution of the explosive force, whilst others reduce it to any degree required for safe handling, and cure any natural tendency to decompose or explode spontaneously. By this means the compound is rendered safe to handle, while its practical explosive qualities under suitable conditions, are in no degree impaired, but generally augmented. Any of several ingredients may be mixed with the explosive compound, according to nature and quality of compound, and the time when and the circumstances under which the explosive material is to be used.

Ample facilities were given us by the manufacturers of the powder, in testing its properties as far as was possible by a few experiments. We took a good substantial sample from the common stock, so as to try the same article in several ways. The first thing to do was to try its explosive force, and as this could only be tested comparatively, samples of Giant, Hercules and Vulcan were first fired, and then the Safety powder.

These samples were all fired with Field's platinum electric exploder and triple Giant caps. They have arranged at the works a simple testing machine, by means of which, when the powder is exploded a weight is thrown up on guides, and the bight automatically registered. A plunger or piston on this weight rests on the charge in the metal block, and as the charge explodes, the weight is thrown up. The charges were therefore "only piston tamped." Each of the samples weighed 100 grains. The first one tried, lifted the 265-pound weight 24½ inches; the second raised it 16¼ inches; the third 16 inches; and the Safety powder under same conditions of piston tamping, raised it 19 inches. When, however, the Safety powder was strongly tamped in the hole, and the piston again rested on the tamped charge, the explosion raised the weight up 76½ inches vertically. This showed its explosive effect was only fully realized when the conditions under which it was to work were properly fulfilled.

To test whether this powder would explode when not confined, we made up a quarter of a pound in a strong cartridge, solidly tamped with a triple Giant powder cap and electric exploder firmly imbedded in the powder. This cartridge we prepared ourselves from the sample originally made, taking care to pack the powder firmly. This was placed on the sand in the lot and the exploder discharged by electricity in the same manner as a Giant powder cartridge is exploded. The effect was somewhat surprising. The exploder fired the cap which exploded with its usual force and burst the cartridge open, but the powder in the cartridge did not explode. One end of the cartridge was found some distance off with probably an ounce of powder still packed in it. Part of this remaining powder we burnt in the open air, and part was placed in the tester after tamping it, where it exploded properly.

We next tried some of the powder on an iron surface by striking and rubbing it with a hammer, but with no results. Part of the sample was then placed on a tube closed at one end. Common gunpowder made into a paste by the addition of oleeginous metter was put on on top of this end the powder lighted. It burned fiercely but slowly, heating the tube to bright redness as the fire entered the tube. On reaching the Safety powder, that in turn burned but no explosion followed, showing that at a red heat it would burn but not explode. It should be stated that although considerable of this powder was burned and exploded during our visit, no injurious effects were felt from the fumes, which are stated to be entirely harmless.

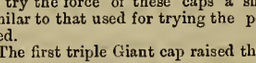


SAFETY POWDER CARTRIDGE.

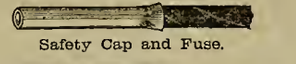
The mode of explosion of this powder is different from that of any other high-grade explosive now in use. When tamped lightly it develops like powders, and gives off peculiar products of combustion; but strongly tamped it develops a very large measure of power, and is said to give off very different products of combustion. The powder is therefore specially fitted for strong tamping and will do very good work.

This same powder is made to do duty in a safety cap manufactured by the same company. To try the force of these caps a small tester, similar to that used for trying the powder, was used.

The first triple Giant cap raised the five and one-half pound weight six and one-half inches; the second, seven inches; and the third, six and one-fourth inches. The first safety cap raised the same weight 11 inches; the second, 19 inches; and the third, 18 inches. These were fired with the piston of the weight resting on them. Then the safety caps were again fired, but first tamped. The first under these conditions raised the weight 44½ inches; the second, poorly tamped, eight and one-half inches; and the third, well tamped, 43¼ inches.



Safety Cap and Fuse.



Electric Cap.

The class of exploders commonly employed to ignite that large class of powders like the Giant, Hercules, Vulcan, and other powders, which require a powerful concussion to produce an explosive ignition, consist usually of a cap filled with a powerful fulminate, this cap being imbedded in the cartridge and having a fuse in it. These caps have to contain so much of the fulminate that they are in themselves very dangerous on account of the ease with which they may be exploded.

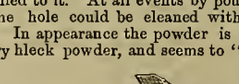
The exploders made by this company consist in filling a tube with the peculiar powder described, which requires to be ignited under pressure in order to explode. A wad of an ignitible or explosive material is used to retain this powder in its place in the tube and renders the ignition of the charge certain, communicating the fire from the fuse to the powder. When the fuse is pushed into the tube, said tube is pinched firmly at its upper edge so as to compress the fuse end hold it tight. When this is done the conditions are fulfilled which render the exploder effective. An engraving on this page shows one of these exploders prepared for its work. When strongly pinched on this fuse they will explode with much greater force than the strongest percussion caps. We saw one of these exploders violently pounded with a hammer on an iron surface without its exploding; and also saw it lighted and burned in a red-hot tube without any explosive effect.

An additional feature in connection with the exploders is a fuse lighter, a novel invention, which will be used in place of snuffs or squibs. It consists in attaching to the end of the fuse a small charge of highly combustible material in a combustible envelope which serves to fire it, while the shell, which holds and fastens it on the end of the fuse, is so formed as to direct the blaze with blow-pipe energy against the end of the fuse and insures ignition.

Altogether the foregoing facts developed by our examination, lead us to the conclusion that under a series of patents already granted and others recently applied for, this company are producing for civil engineering and mining works some very novel and valuable products.

The safety cap, safe to handle and even to set on fire if not confined, with far more power than any percussion caps in use—will certainly be preferred by all sellers and users of Giant, Hercules, Vulcan or other detonating powders.

The fuse lighter, fastening on the end of the fuse, and lighting it without fail, is so much more convenient and certain than "snuff's" that we should think once known miners would be sure to use them. An engraving shown herewith will give an idea of the use of this fuse lighter. Judging from what we saw the other day, we should think that in using Safety powder and caps no hole need ever be lost. The cap can evidently be pulled or dug out with perfect security, and the powder taken out by any thing that would not give it harder friction than we saw applied to it. At all events by pouring in water the hole could be cleaned with an iron spoon. In appearance the powder is dry like ordinary bleck powder, and seems to "set" soon after being put up. In this State, of course, it is not liable to freeze.



Fuse Lighter and Fuse.

ROWELL'S AMERICAN NEWSPAPER DIRECTORY. The January issue of this quarterly, containing some 550 pages, is on our table. Aside from its intrinsic merits, the book is a handsome one, doing credit alike to the printer, the binder and the compiler. As this work contains an accurate list of all the newspapers and periodicals published in the United States, Territories included, the Dominion of Canada and Newfoundland, it ought to be one of general interest and utility. It should prove especially serviceable to the advertising community, showing as it does the circulation of every publication on its list, thereby indicating the value of each as an advertising medium. It also contains much valuable information in regard to the leading cities and towns in the above countries, this gazetteer feature being new with the present number. The work is issued quarterly at the rate of $5 per year to subscribers, and has now a large circulation.

A MISPLACED switch in the yards of the Indianapolis, Cincinnati and Lafayette railroad threw an incoming locomotive into a tank-car loaded with oil, which took fire and burned a number of cars. Loss, $7,000.

THE recent report of cattle men being murdered in Nebraska by Indians has been confirmed.

Should Earn a Little More and Spend a Little Less.

To the practice of the economy indicated above, our people must bring themselves before they can reasonably hope to experience any marked or permanent improvement in their physical condition. We know that this sort of thing has been preached a good deal, and may be looked upon by the classes for whom it is more especially intended, as being a little stale and monotonous. Besides, the majority of these people are apt to think that they really do earn as much and spend as little as is consistent with their health, comfort and social position. And so they do, if they are going to be particular as to the condition on which they accept employment and the kind of labor they perform—always insisting upon the shortest hours and the highest wages; are going to indulge in useless luxuries, and cherish a variety of artificial appetites; smoke, drink, take time for balls, billiards and horseraces, frequent the theaters, go weekly on picnics, pleasure excursions, etc. No class of laborers, or persons who work for day wages, or on small salaries, can pursue a course like this, and expect to thrive. Take, for example, the young man who is addicted to going to balls or dances. As these amusements are carried on at night, he is necessarily unfitted for work the next day, which, with the time lost in preparing for them, causes him on an average a loss of two full days. Then the expense consumes the earnings of two or three days, to say nothing of the extra fine clothes these balls require, the injury to health they occasion, etc., making a serious total of mischief worked through indulgence in what is generally accounted a harmless recreation.

While it is probable that we shall have a tolerably good year for farming and mining, not much improvement need be looked for in our mechanical and manufacturing industries. These will remain depressed; building will be dull and labor of most kinds be in limited demand and possibly at reduced prices. The Chinese still remain with us, a considerable immigration from the East will bring fresh supplies upon the labor market, while increased transportation facilities force us into sharp competition with manufacturers abroad. The industrial outlook is such, therefore, as admonishes the masses wanting work to the practice of prudence and economy. They should at once begin to husband their resources and reduce expenses to a minimum. Employment of almost any kind should be accepted even though the wages be moderate, and those having situations should retain them without being particular about minor conditions. Money on hand should be hoarded. It is no good time this, for people of small means to be gambling in stocks or embarking in other hazardous speculations. Let them hold on to what they have and try and add a little thereto, retrenching expenses wherever possible. The good old days of the slugs and ounces have passed away. The era of the *nickel* is upon us, to be followed, perhaps, by that of the old-fashioned red cent, a coin of small purchasing power but with some of us of blessed memory. Though they had in the South aforetime no coin less than the picayune, the mass of laborers there were not thrifty. Having lived in California to see this day of small things let us wisely conform to its requirements, bearing in mind that a little more earned and a little less spent is a policy that will secure to us now a larger share of the comforts of life than were common in the flush times of the past.

ROBERT T. BURTON is on trial at Salt Lake for the murder of Mrs Bowman in 1862. It is charged that after the surrender of a party of Morrisites to Mormons in that year, he shot and killed Morris and two women.

THE Constitutional Convention of this State, and the Legislature of Nevada, have telegraphed resolutions to President Hayes, urging him to sign the Anti-Chinese bill.

JAPAN is now manufacturing boots for the United States from leather brought from American ports.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Siskiyou Notes.

Editors Press:—A perusal of the interesting "Notes on Trinity County," recently published in your paper, has induced the writer to send you the following notes on Siskiyou county. This county presents an inviting field for hotb capital and lahor. Her mountains are rich in gravel deposits and quartz veins, bearing gold in paying quantities. From these snow-clad mountains numerous streams of ever-living water wind tbeir way into the beautiful valleys below, of which Scott and Sbasta valleys are the most beautiful, fertile and productive, yielding never failing and abundant crops of wheat, oats, barley, timothy, alfalfa and every variety of vegetables. Her towns and villages are conveniently located at the hase of the mountains, so as to command the trade of the farming and mining sections, and in a measure unite tbese interests.

It is claimed by some that our

River and Placer Mines

Are nearly worked out. Tbis is a mistake. Fifteen years ago the same cry was raised "that the mines are worked out," and yet we have more extensive and gigantic mining enterprises here now tban ever heretofore. On the South fork of Scott river Denny, Parker & Co. have, at a cost of $30,000, and several years of patient labor, opened a river claim that is paying $1,200 to tbe sluice length with pick and shovel. And then the Bennet & Miller claim on Salmon river, Pacific claim on tbe Klamath river, "Lucky" Baldwin claim on Yreka creek, and other mining operations demonstrate that we have many rich and extensive fields for mining operations, which require only tbe necessary energy, capital and lahor to make them remunerative.

A Great Gravel Deposit

Extends from Trinity county, in a northerly direction, through this county into Oregon, and where broken by streams, has been very rich. We bave good facilities for obtaining water for miuing purposes, and the mountains usually retain the snow and keep the streams up to ahout the first of July. The average rainfall is ahout 25 inches. Timber for lumher and mining purposes is plentiful, and easy of access for all the mining regions. Produce is cheap, flour heing only $2.50 per 100 pounds. Being connected hy good wagon roads with Reading, the present nortbern terminus of tbe C. & O. R. R., freight can be hrought here from San Francisco at three cents per pound. Lahor is cheaper than in most other mining localities. The experience of working

Quartz Mines

Has shown that rock can he extracted and reduced at a cost of $4 to $5 per ton. Of late years more attentiou has heen given to the development and working of quartz mines. The most notable mines are the Black Bear, Klamath, Evening Star, Northern Star and Star of the West on Salmon river, which now employ ahout 500 men, and are well paying mines. Tbe Johuson mine, at Oro Fino, which is now opened to a depth of 300 feet or more, the rock of which has thus far averaged $30 per ton. The Empire, Tonkin's Con.; Blind Lode, Blue Jay, Elephant, Horsler, Hartstrand, Kingery and Root minos are hcing opened and give most flattering prospects. These last six mines are located on the Frcnch Creek lode, whicb can he traced for a distance of four miles.

Mr. H. C. Cory,

A resident of this place and a most enterprisiug gentleman, owns the Blue Jay and Elepbant, which are eacb 1,500 feet in length. He has expended considerahle money in opening these mines, and is deserving of great credit for the energy and pluck he has shown in his efforts to make this a successful mining enterprise. He is now down on the ledge ahout 150 feet, wbere the vein averages ahout four feet in thickness, and carries gold iu paying quantity as far as prospected.

The ore from his mines has paid, by milling process, from $10 to $60 per ton, and the ore body improves in quantity and quality with deptb. Assays of average rock from these mines have shown $65.84 per ton. The snecessful opening and working of these mines will he of great henefit to our people, and they should give all possible encouragement to these mine owners. With few exceptions the quartz veins extend in a course nearly north and south and parallel with the mountain ridges. All the veins thus far discovered bave heen found where streams of water have cut through them. These streams are usually chosen for mill sites, as they afford ample water and timher for mill and mining purposes. Our mines are mostly opened in these outside counties with

Home Capital,

And sometimes by inexperienced men; hence the many discouraging failures, which are alike detrimental to the development, growth and prosperity of the country and mining enterprise, as they deter men from engaging in mining operations.

All that our mines need to invite foreign capital and experienced miners to invest in them, is a proper representation. Sbould a few San Francisco mining companies once obtain a footing here, more would very soon be knowu of the mineral wealth of this locality, and a new impetus would he given to the mining interests of Siskiyou. Etna.

Etna, Siskiyou Co., Jan. 25th, 1879.

Progress of Bodie.

Editors Press:—Since last April, when I wrote a series of letters from here to the Press, the population of the district has doubled. Four thousand is a low enough estimate now, with two stage lines and a fast freight line; making additions daily. The Carson route has a strong rival direct from Virginia City—that via. Mason valley, and utilized by John Allman. Early in the season, the Sonora route will be reopened. The Virginia and Truckee railroad is recorded as on the eve of extending a branch this way as far as the foot of the grade at Aurora, via. Mason valley; so that what was a year ago a *terra in cog.*, is destined to he hrought to the doors of San Francisco at a very early day. Bodie is the central attraction for the time, hut it will he singular indeed if Mono county generally does not come to the front as a fresh field of great magnitude in the mining way.

The writer was

Not Surprised

At the excitement created here last July and August. The Standard mine could have anticipated it on a larger scale, had tbe management been disposed to crowd its rich reserves to the front. Lucky for the district tbat this did not take place, else matters would have a gloomy instead of a cheerful outlook at this time. Tbe Bodie claim had little or no development made, and no sooner did the Bruce ledge stick one end out hy the light of the tallow candle, than the work of scooping out begun. By hurrying up heavier machinery, they have got work so advauced that it is possible a new level of importance may he opened before tbe ores overbead are exhausted. I find

More Reserves

Than expected, and am almost convinced that the company will continue its regular dividends until new ore hodies are found. Tbe public at large bave prohably been mislead regarding the real extent of the Bodie mine, the Bruce honanza having overshadowed the Burgess, and especially tbe Gildea. The latter has supplied a great deal of ore that paid well to mill, and is not yet exhausted above tbe 250 level. All three ledges continue below, hut it remains to he seen whether they bold their own every way to the proprosed new level. If they do, Bodie stock will repeat its highest figure and more, too.

The Three Ledges,

Which have rendered the Bodie claim so famous, extend uorth into the Standard, the Burgess shipping ore of a very high grade, wbile the Bruce carries with it all the characteristics of its hest days; in all, practically doubling the value of the originally great Standard property, the main ledge of which constitutes a back-hone that Bodie district could not as yet live without. It has heen one of the very best managed institutions in the history of quartz mining; characterized hy hoth faith and foresight. They are now putting the macbinery in place for sinkiug tbe new Central shaft to a greater depth than any other company possihly can go at present. All the pumping and air-compressing machinery is on the grouud. Tbe new shaft is near 800 feet in depth now, and will he sunk douhle tbat depth if necessary.

Crosscuts

From the 1200 or 1500 level will he quite apt to settle the future of Bodie Bluff. The Bulwer claim is under the same management, and is "proved up," as tbe miners say, to be scarcely second to tbe Standard in importance. A crosscut from the new sbaft of the Standard has found the Ralston ledge in the Bulwer 180 below tbe old levels. With the Homestake and Stonewall ledges carried down to tbe 400 level, including all their well-known richness, and there will he a solid hasis for a sensatiou that will oversbadow the affair of August last. A very few feet of crosscut will decide this matter.

The Want

Of the district at present is another good mill; some such close-working reduction works as the Standard. The Bodie company's mill is unfortunate in not having a regular supply of water. Tbey are still prospecting for it, and the Bulwer ore goes hegging. Tbe Bodie company are still employing the Syudicate mill under contract of last summer.

Other Mines.

Tbe Summit company are developing a hullion-prodncing mine. Con. Pacific recently made a shipment, and is carrying out a general system of development. Tbe Tioga Con. is the Standard north, and is one of tbe interesting features of the district. The Jupiter is supposed to he the south extension of the main Standard mine; is a strong, rich ledge and threatens to make more tban a ripple of excitement some day. The Dudley, still farther south on same line, is a fine showing for a hig mine. As I get around and see for myself, I will endeavor to interest your readers on tbe subject of the Bodie mines for some weeks to come. W.

Bodie, Mono Co., Feb. 5th.

Railroads.

Eastern Capital Seeking Good Investments.

The *Railway Age*, Jan. 9th, says: The distrust that has heen felt by Eastern capital, since tbe panic, in regard to investment in Western railway enterprises—often, it must he admitted, with too good reason—is now rapidly yielding, and while much greater caution will he exercised hereafter in regard to the character of the enterprises and the men iu charge of them, there will he an increasing disposition to invest in tbose that seem to have a sound basis, tho continued growth and development of the West being admitted to ho heyond question.

The changed sentiment is illustrated in the following extract from an interview hy a Kansas newspaper man with the President of the Central Branch Union Pacific road: The *Champion's* representative asked him if the Easteru people of the road were prepared to supply the necessary funds for the prosecution of so gigantic an enterprise. Mr. Pomeroy replied tbat tbey were not only prepared, hut in their anxiety for investment the directors had been compelled to refuse application for stock, and tbat enough money, when necessary, would he subscribed in five minutes' time. Money was so cheap in the East that it was continually seeking Western investment, and the distrust felt a few years ago in Western stocks and honds had given way to an absolute demand, and that money was being taken every day from legitimate Easteru channels and used for speculative investment in Western enterprises. He cited as an instance tbat great stock wonder, the Santa Fe road, which advanced from a drug at 10 cents to an active demand at 85 cents.

The Northern Pacific

By the contract awarded December 28tb, in New York, will be completed to within 25 miles of the Montana line, and 100 miles of the Yellowstone, opening up a section including some of tbe hest agricultural land in the United States.

The Directors awarded the contract for huilding the first 100 miles of the road west of the Missouri river to Walker & Clark. Walker is a resident of Peeksville, and Clark lives in Montana. A great many other contractors were present at the office, and disappointment set very visihly on their countenances. Tbe company will pay the contractors monthly in cash, reserving 15% until the completion of the contract. The cross-ties, railroad iron and fastenings will be furnished by the company, and 100 miles of the road is to be in running order by November 1st, 1879. No attempt will he made at present to bridge tbe Missouri river at Bismarck, but a good ferry will he established, beginning at Heart River Valley, opposite Bismarck. Tbe line, as at present surveyed, runs nearly west to tbe Yellowstone, at the mouth of Glendive's creek, which is about 30 miles helow Powder river.

The country is rolling prairie, said to he well supplied with wood, water and grass. Coal is found at a distance of 25 miles from the Missouri river, and from tbat point west coal veins crop out on nearly every stream crossed.

Some of the Montana papers that declare the N. P. R. R. grant forfeited, stoutly refuse to lend credence to the tclegraph, or to any reports of vitality in the Northern Pacific under any circumstances.

The Bodie Railroad.

Alpine *Chronicle*, Jan. 4: The building of the branch railroad from Mound House to Bodie has heen decided upon. D. O. Mills, President of the company, is now in the East, where he has made satisfactory arrangements for the rails and rolling stock. Tbe work of getting out timhers, etc., will go on this winter, and the grading of the road will he commenced early in the spring. The rails will be shipped this season.

In Arizona.

Arizona Sentinel, Jan. 4: Work was commenced Novemher 18th, but the main force of graders did not arrive until Novemher 20tb and 21st. During tbe week ending Novemher 23d four miles had heen laid and a fair heginuing made at organizing. During tbe 32 working days following the latter date, there have been constructed 27 miles of road, over the most difficult part of the whole route between Yuma and Tucson. Just behind Old Mission Camp the train crosses three temporary bridges of crib-work, flanked hy heavy fills; two of these are 208 feet long, each, and nearly 15 feet high. The road cuts through the south end of the corral at New Mission Camp. At Rattlesnake hill it goes over a long fill of some 24,000 cubic yards; this work was done in three days, its rapid completion reflecting great credit on Stroubridge's skill iu bandling his forces.

The rapid progress made over the difficult country hetween Yuma and Gila, justifies Strobridge's assertion that he car, if required, lay tbe track over the comparatively easy country between Gila and Maricopa Wells hy April 1st, witb his present force. He does not now expect to consume over four months in doing that, in any event.

The line passes over the mesa about a mile and a quarter south of Fillihuster Station, which is 44 miles east of Yuma by the stage road. Coming from there by stage, as we neared Martinez camp, we saw, to the southeast, clouds of smoke raised by hrush-burners in advance of the graders. Fogs of dust soon indicated the whereabouts of the latter, strung along for several miles. Ahout a quarter of a mile south of Martinez was a group of tents occupied by teamsters and well-diggers, and a donkey engine emitting vigorous puffs of smoke and steam.

Salt Lake and Colorado River Railroad.

According to the Salt Lake *Tribune*, Jay Gould subscribes for one-half of the stock in the new railroad from Chicken Creek to Frisco, one-fourth is to he held hy the Mormons, and the remainder hy tbe Bonanza people. If that means the extension of the Utah Central south to the Big Bonanza mines, it is a most important railroad link. In Iron and Beaver counties, Utah, the mines of coal, iron, lead and silver are among the richest and most extensive in the Union. The coal is of so pure a quality that it is used for all purposes of the forge, and when coked makes the finest possihle material for fuel for smelting furnaces. There are now very extensive coking furnaces 150 or 175 miles south of tbe present southern terminus of the road, while tbe amount of ore which is rich in lead but not sufficiently rich in silver to justify freighting hy teams, is described as enormous. The Union Pacific Company now coutrol the road running south from Salt Lake City, and the exteusion would not only secure the trade referred to, hut would take from the Central Pacific all the trade of southeastern Nevada and turn it toward Salt Lake. It is a good project, and would return 100% on the capital necessary to construct and equip the road every 18 months.

Salt Lake and Idaho Railroad.

The Utah Northern has now heen extended from Ogden into Idabo, 200 miles. One hundred miles of this have heen huilt witbin the past year. Tbis road is opening up new fields of trade, which will grow as tbe line extends into Idaho and Montana. With this new route the trade of Oregon and Washington will be secured ultimately; but it is uow the intention of the company to push the road the coming season toward tbe rich mines and pastures of Idaho and Montana.

New Mexico Has Been Invaded.

The Denver and Rio Grande railroad has finally crossed the line from Colorado.

The project of offering homes in New Mexico, along the line of a proposed railway, is attracting some attention among workingmen in New York. Twenty-acre farms, with cattle and farming implements, are sold for $200.

One Remarkable Feature,

Says the *Railway Age*, of the western situation at present, is the movement of so many lines to secure a share of Colorado business. It is only about eight years since the first locomotive crossed the plains and reached Denver. Now tbree great trunk lines, the Union Pacific, Kansas Pacific and Atchison, Topeka & Santa Fe, run their trains thither, and two others, the Burlington & Missouri River in Nebraska and Central Branch Union Pacific, have started for the long race of about 400 miles across the plains to the same destination. The former of tbese has reached Red Cloud, Nebraska, and is pushing up the Republican river. The Central Branch road now runs to Beloit, Kansas, on the Solomon river, and an Atchison paper reports President R. M. Pomeroy as saying the line would be extended 100 miles west of tbat point "just as fast as an unlimited supply of money and men could do it," and that a through line to Denver was "an absolute certainty." It is not improhable, therefore, that within a few years as many as half a dozen independent lines may span the width of Kansas or Nebraska and reach the foot of the Rocky mountains. Tbe impulse for this great movement is the prospect of traffic from the new lands to be developed along the line, as well as in the mineral regions of the mountains, which are probably but commencing to reveal their wealth.

Mexican Lines.

From the American deputation now in Mexico, we learn that the Mexican government desires to connect the Atlantic and Pacific coasts hy a railroad from Tampico to San Blas, and is disposed to give a liberal subsidy in aid of tbe undertaking. At the Mexican capital, General Frisbie, is ahout to establish a hank which will conduct business on a broad and progressive hasis. It is likewise contemplated to organize a transportation company, which shall undertake hanking operations and enable manufacturers in the United States to transact business with safety and dispatch in the Mexican republic. It is likewise proposed to huild an internatioual railroad, which, beginning at the terminus of tbe Great Northern railroad at Austin, Texas, would pass tbrough Laredo, Saltillo and San Luis and terminate at the Mexican capital. An able document in support of this project has been published, and 2,000 copies thereof will he circulated in Mexico during the stay of the deputation.

The elaborate investigations made at Altoona by Prof. Charles B. Dudley, chemist of the Pennsylvania Railroad Company, of the chemical composition and physical properties of many old steel rails have led him to adopt the important conclusiou tbat they sbould bave, of phosphorus, not above 0.10%; of silicon not above 0.04%; of carbon between 0.25% and 0.35%, with an aim at 0.30%; of manganese, between 0.30% and 0.40%, with an aim at 0.35%.

A highly respected Russian embezzler—who stole a million dollars—has heen sentenced to six years penal servitude in Siberia.

MECHANICAL PROGRESS.

Transverse Strength of Materials.

The transverse strength of beams is a complex quantity, which demands *two* elements—its tensile strength and its resistance to crushing. This becomes evident when we consider that when a beam is supported at both ends and a load placed on top of it, the fibers in the lower part will be extended, while those in the upper part will be crushed together. Between the two there will be a line, or rather plane, in which there will be neither extension nor crushing. This line or plane is called the neutral axis. When a beam is solidly fixed with one end in a support and the free end loaded, the inverse action takes place—the upper fibers will be extended or stretched, while those below will be subject to crushing strain; but here also there is a neutral axis, or a line between, where neither extension nor crushing takes place.

It has been laid down in some treatise on mechanics that this neutral line is always half way between the upper and lower part of the beam; but this is evidently erroneous, or at least an incomplete statement, as the section of the beam has an influence; if the section at the upper part is larger than it is at the lower part, it will have more strength, and *vice versa*, hence the neutral axis must be higher or lower than half way. It is more correct to state that the neutral axis passes through the center of gravity of the cross section, thus in a triangular beam, with the apex on the top, it would be at one-third of the hight instead of half way.

But this statement also is incomplete, as it leaves out of account the difference in crushing and tensile strength, which some materials may possess. If, for instance, we have a hard alloy like bronze, with great power of resisting crushing pressure, but with a comparatively small tensile strength it is evident that when submitted to transverse strain a gradual increase of the same will submit more fibers to tensile strain, for the reason of the greater resistance to crushing strain, and the neutral axis will necessarily lie nearer to the part compressed by the effect of the load, and further from the side where there is the greatest tensile or extensive strain.

This is the reason why it is unreliable to deduce the transverse strength of materials from the combined action of their tensile strength and power of resistance to crushing strain, and separate apparatus are used for the purpose of finding the transverse strain, directly by experiments. Such an apparatus has recently been devised by Prof. R. H. Thurston, of the Stevens Institute, Hoboken, N. J., who, as is well known, is foremost in his experiments on this subject, so highly important in practical mechanics.

Steam-Boiler Inspection.

The Hartford, Conn., Steam-Boiler Inspection and Insurance Co. is doing a good work. In a recent communication from Mr. F. B. Allen, the President of that Association, to the *Manufacturer and Builder*, the question—"Is Government Inspection of Steam-Boilers a Failure?" is discussed at some length, and a comparison is drawn between the efficiency of government inspection and that of the company, that is decidedly to the discredit of the Government Board of Supervising Engineers. We give herewith a summary of the facts presented, representing the same number of years (1870–1877) in the two classes of work:

U. S. Board of Supervising Engineers.

Total number of boilers tested	42,473
Total number of lives lost by explosion	667
Total amount of property destroyed by explosion	$623,514

Hartford Steam-Boiler Inspection and Insurance Co.

Total number of boilers examined	56,145
Total number of lives lost by explosion (since organization of the Company, 12 years)	25
Total amount of property losses	$74,381

Mr. Allen, from the above showing, draws the inference, that Government inspection of steam-boilers is a failure. We do not see how any other inference could well be drawn.

LOCOMOTIVE BUILDING IN 1878.—Locomotive building during the past year has shown quite an improvement over the two or three previous ones. Statistics show an increase of from 35% to 40%. A large portion of this increase has come from foreign orders. During the year, locomotives have been shipped to Russia, Brazil, Peru, Cuba, Nicaragua, Norway, Italy, Australia, and New Zealand. Forty have been sent to Russia alone. These distant and diverse shipments indicate the establishment of a permanent foreign trade in this important branch of industry. The shipments this year to either Norway or Sweden are the first ever made. The great reduction in price is also a most noteworthy fact connected with this business. Prices have had a shrinkage of fully 50% during the past five years. Locomotives which cost $10,000 in 1873 can now be bought for $5,000. Cost of production has decreased largely, but not in proportion to selling prices. It was stated in a late number of the *Iron Age* that the Baldwin Locomotive Works had just received *by cable*, from Europe, an order for nine of their largest-sized locomotives.

The Need of a Standard Screw-Thread.

Any one who realizes the important part performed by bolts and nuts in railroad machinery, would naturally suppose that a standard system of screw-threads would have been practically as well as formally adopted long before this. Such, however, is not the case, so far at least as the practice is concerned, and consequently the great advantages to be derived from such a system have not been realized. The Master Mechanics' and Car-Builders' Associations adopted what is known as the Sellers or Franklin Institute system, several years ago, but owing to an imperfect understanding of it the desired uniformity in the threads and diameter of bolts has not been attained. One peculiarity of this system is that the screw-threads, instead of terminating in a sharp edge or point, are made flat at the top and bottom, and the pitch is fixed at an inclination of 60 degrees. By doing away with the pointed or V-shaped thread, the diameter and consequently the strength of the bolt are increased without lessening, to any extent, the strength of the thread. The diameter of the bolt can also be measured with greater accuracy for the reason that the depth of the sharp thread will vary as the point of the cutting tool wears. A sharp edge is also more liable to injury than are the threads with flattened tops.

A table of "Standard Screw-Threads," adopted by the Car-Builders' Association, at Richmond, Va., 1871, has been printed in most of the annual reports of the association since then. This table gives only the outside diameter of bolts and the number of threads to the inch, as being all that is essentially implied in the system adopted. The result has been that different taps and dies for the same size of bolt are in use on different roads, the diameter of the screws and the form of the threads not being alike in many instances. This is owing to the fact that only a part of the dimensions specified in the Sellers system have been adhered to, regardless of the fact that no uniformity by which such bolts can be made interchangeable can be had, unless every requisite of the system is strictly carried out. The angle of pitch, length of sides of thread, diameter of bolt at bottom of thread, and width of flattening at top and bottom, are all equally necessary in order to secure good fitting and interchangeability. This may be obtained by the use of a proper gauge for grinding the tools for cutting the threads, and by having all taps and dies conform exactly to the standard. A more detailed account of the Sellers system, illustrated with cuts showing the form of threads, bottom of gauge, etc., will be found in the *Car-Builder* for August, 1877, and also in "Forney's Catechism of the Locomotive."—*The National Car-Builder.*

STEEL NAILS.—That iron is slowly but surely being supplanted by steel is an important fact, but probably few would think that the familiar wrought-iron nail is destined to be replaced by a steel one. Yet this appears probable, and Messrs. Jones Brothers & Co., of Middlesborough, are entitled to the credit of being pioneers in this improvement. The difference in price between steel and iron is of absolutely no consequence in an article of this kind, while the superiority in quality is in many cases of considerable importance. The nails which we have seen are of several varieties, and the toughness of the metal is very remarkable. A nail selected at random is capable of being bent upon itself cold, while it is firm enough to go into the hardest wood. Considerable pains is taken by the makers to give not only a good head, but a good shape throughout the length, so as to avoid the wedge action of too many cut nails, which tends to split the wood in which they are being driven just at a critical moment. These nails are made by special machinery, which certainly seems to do its work very well, and they are in every respect well worth a trial by all who are dissatisfied with the nails commonly sold.

IRON GALVANIZING FURNACE.—In galvanizing iron the main point to ensure a uniform coating of zinc is the maintenance of a thin bath of metal. Unfortunately the zinc absorbs iron, thickens, and as the temperature must be rapidly raised, when it does so this absorption goes on increasing until the metal is unfit for further use. This is aggravated by the fact that the metal is melted in cast or wrought-iron vessels heated from below. *Iron* says that in order to avoid the disadvantages of iron vessels, and yet retain ample working space above the surface of the metal, F. A. Thum, of Laubach, Germany, has constructed a furnace resembling somewhat a reverberatory furnace. It has a fireplace and a chimney at each end, the part of the hearth connecting the two being arched over. The rest of the rectangular hearth is perfectly open above, so that the heat-conducting power of the metal is relied upon to keep it at the proper temperature in that part of the hearth. The slabs of fresh zinc are introduced through doors communicating with the hot ends. The staying of the furnace has to be very strong, in order to prevent any accidents to the arching over the ends of the hearth.

RAILROAD PATENTS.—It is said that there are now more than 165,000 American patents alive which relate to devices used for railroad purposes—1,700 of which are upon car-couplers.

SCIENTIFIC PROGRESS.

Mountain Making—How the Alps Were Formed—Geological Theory.

Prof. Judd, of the Royal School of Mines, London, gave recently an interesting explanation of the formation of the Swiss Alps. The results of geological observations, he said, show that four stages can be recognized in the history of these Alps. First, the existence of a line of weakness in the earth's crust nearly coincident with the line of the present mountains. This is evidenced by the fact that along this line of weakness there were volcanic outbursts, the result of which can still be traced. Secondly, there followed along this line of weakness a depression, and in this huge "trough" of miles in extent there accumulated sands, limestones, and clays by various forms of water agencies, and by animals living in the waters. Thirdly, there followed the consolidation of these soft and loose materials. There is evidence that the accumulation was of from six to seven miles in thickness, and the mere weight of the superincumbent material on the lower strata would have a share in effecting consolidation. But this was not all. Under this vast covering heat had led to crystallization from fusion. There was, too, the crushing in from the sides of the trough. This was illustrated by a model of the late Sir H. de la Beche, where lateral pressure was employed on layers of different colored cloth, showing how crumpling resulted, with uplifting of parts of the accumulated mass. Fourthly, there had been the sculpturing of all this into its present form, which was the work of rains and frosts. Some of the existing peaks, even 3,000 feet high, were composed entirely of the disintegrated material resulting from the action of the water, either as ice in glaciers or as rain and streams. The amount of material removed in this was so stupendous that it was almost staggering to try to grasp the facts. The sculpturing of the contours is still going on. This fourth stage was of quite recent date, speaking geologically; but the whole history involved a lapse of time which at the beginning of this century philosophers would not have been prepared to grant, even if the since-acquired knowledge of facts had been presented to them.

THE LIGHT FROM VENUS AND MERCURY.—Quite a singular and most unexpected discovery was made at the near approach of these two planets in September last, by Mr. James Nasmyth, an English astronomer. It remains to be seen whether photography or spectrum analysis will some day give us the key to the enigma. The fact was then first distinctly observed that there is a great difference between the degrees of brilliancy emitted by these two planets; and, that while Mercury being much nearer the sun should be more brilliant, just the contrary happens, for Venus shines with the greater luster. On the 26th and 27th of September these two stars were near enough to be embraced within the field of the lens at the same time, and Mr. Nasmyth was thus enabled to compare the brilliancy of Venus to polished silver, and that of Mercury to lead or zinc. The reason of this difference, which is theoretically exactly contrary to what we should expect, is at present unexplainable.

LIQUEFACTION OF OXYGEN.—M. Raoul Pictet concludes an article on the liquefaction of oxygen with the remark that his investigations necessitated an unusually large number of experiments for the establishing of preliminary data, and these he obtained by the aid of the Geneva Society for the Construction of Physical Instruments, who furnished him with apparatus worth 50,000 francs, and thereby enabled him to work out results with perfect accuracy. He recommends that similar apparatus should be provided in all laboratories as an "essential means for the study of the molecular forces. Who knows," he asks, "but what crystallization and certain reactions may thereby be placed in peculiarly favorable conditions for further investigation?"

ELECTRICAL TELEGRAPHING WITHOUT WIRES. Prof. Loomis continues his experiments in the mountains of West Virginia, to demonstrate his theory that at certain elevations there is a natural electric current, by taking advantage of which telegraphic messages may be sent without the use of wire. It is said that he has telegraphed as far as eleven miles by means of kites flown with copper wire. When the kites reached the same altitude, or got into the same current, communication by means of an instrument similar to the Morse instrument was easy, but ceased as soon as one of the kites was lowered. He has built towers on two hills about 20 miles apart, and from the tops of them has run steel rods into the region of the electric current.

IMMENSE GLACIAL REMAINS.—Prof. T. V. Hayden says that on the east side of Wind River peak, Wyoming Territory, and on the east base of Fremont peak, the remains of the huge glaciers which once covered the region have been discovered. On the west side of Wind River range, the moraines and glaciated rocks were found on an immense scale. He thinks that on this side a glacier must have formerly existed having a length of 80 miles and a width of 12 miles with arms extending up the gorges of the streams to the very water divide.

IS THE SUBDIVISION OF ELECTRIC LIGHT A FALLACY?—Mr. W. H. Preece, the eminent electrician and manager of the English postal telegraph system, contributes a paper to the *Philosophical Magazine*, in which he points out that the theory of the electric light cannot be brought absolutely within the domain of quantitative mathematics, for the reason that we do not yet know the exact relationship existing between the production of heat and the emission of light with a given current. We, however, know sufficient to predicate that what is true for the production of heat is equally true for the production of light beyond certain limits. He shows that the full effect of a current can only be obtained by one lamp on a short circuit, and that when we add to the lamps by inserting more of them on the same circuit, or on a circuit so that the current is subdivided, the light emitted by each lamp is diminished in the one case by the square, and in the other case by the cube, of the number inserted. With dynamo-electric machines there is a limit which has to be reached before this law begins to act, and it is this fact that, in Mr. Preece's opinion, has led so many sanguine experimenters to anticipate the ultimate possibility of extensive subdivision of the light—a possibility which he considers hopeless, and which experiment has hitherto proved to be fallacious.—*Scientific American.*

THE ELECTRIC LIGHT DANGEROUS.—Mr. J. M. Stearnes, Jr., of Brooklyn, points out a novel source of danger possible with the electric light, namely, its effect upon the nervous system. He says: "The very high penetrating power of light waves from incandescent metal or carbon heated by electricity is well known. It is so high, indeed, that the shadows cast by the light are blacker than Erebus, indicating an immense absorption of force by the intervening objects, and to a large extent destroying their reflection and diffusion, as is the case with lights of lesser tension. A reflector used with an electric or calcium light does not produce anything like a corresponding effect as when used with a common gas flame, as persons familiar with calcium lights well know. And it follows, therefore, that the black shadows of the electric flame must be due to the absorption of light waves. Now, in the light of an electric arc or incandescent lamp, one is to be subjected to a very powerful stimulant from the mere obstruction which his body affords. Our eyes cannot bear it all, and there is no reason to doubt that every nervous tissue will feel its use. We have already in this climate enough of nervous stimulation, and a fearful catalogue of nervous diseases, arising from too much force."

GEOLOGICAL.—The *Polytechnic Review* learns through a private letter from Dr. T. Sterry Hunt, that the Geological Congress at Paris was a great success. There were 260 members present; and various committees were formed, the work of which will prove highly important and useful. Arrangements were made for a Congress, to be held in 1881, at Bologna. From another source we learn that Dr. Hunt has returned from England, and will spend the winter in Montreal, Canada, where, as scientific men will be interested to hear, he expects to devote himself to important scientific investigations. Before leaving England, he accepted an invitation to deliver two lectures at Cambridge—a graceful and merited recognition of the ability and reputation of an American *savant*.

INSTANTANEOUS PHOTOGRAPHS.—The success of Mr. Muybridge of this city, in taking a number of *instantaneous photographs* of a horse at full speed have attracted much notice, not only at home but also abroad. M. Marey, in *La Nature*, who has made extended investigations upon the subject of the analysis of animal motions, appears to have been greatly struck by the pictures of Mr. Muybridge, and believes that his success provides an admirable means of studying in every successive position of motion the very difficult problem of the flight of birds. "What beautiful zoötropes," he suggests, "might be obtained by this method. We might see in their true paces all sorts of animals; it would be a sort of animatic zoology. As to artists, it is a *revelation* for them; for it furnishes the true attitudes of motion; those positions of the body in unstabled equilibrium in which a model cannot 'pose.'" In connection with this last point, it may be of interest to notice that many of the attitudes exhibited by Mr. Muybridge's pictures are very unlike the stereotype ideal.

SOALR AND ARTIFICIAL HEAT.—Prof. S. P. Langely, Director of the Alleghany Observatory in addition to the routine work connected with the institution over which he presides, has lately been busily engaged in completing a direct experimental comparison between the heat of the sun and the highest heat attainable in the arts. The result of his investigations indicate that the sun's *intrinsic* heat is almost beyond comparison greater than that of any blast furnace, and far larger than has been reckoned by the French physicists.

MR. LOCKYER'S RECENT PAPER.—The last number of the *American Journal of Science* contains Prof. Lockyer's paper in full, on the "Dissociation of the Elements," as read before the Royal Society of London, on the 12th of December last. The paper is entitled by the author, a "Discussion of the Working Hypothesis that the so-called Elements are Compound Bodies." The paper is quite fully illustrated.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Jan. 30.		Week Ending Feb. 6.		Week Ending Feb. 13.		Week Ending Feb. 20.	
Alpha	15⅝	14	18¼	15	21	19	21	15⅝
Alta	8⅜	7¾	8¼	7⅝	8¼	7⅝	7⅝	7
Andes	50c	45c	50c	....	80c	50c	50c	65c
Alps	....	....	....	....	....	....	....	....
Argenta	70c	60c	65c	60c	70c	55c	65c	60c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1¼	1.20	1¼	1⅛	1¼	1	1	....
Belcher	6	4⅞	6⅝	5⅜	8¼	6¼	8¼	7½
Belmont	70c	55c	80c	70c	50c	45c	55c	50c
Best & Belcher	22	21¼	24¼	21½	26	24	25¾	24
Bullion	8½	7⅝	6½	7⅝	9	8¼	8⅜	7½
Bechtel	75c	....	75c	....	80c	50c	70c	55c
Belle Isle	20c	15c	....	....	20c	....	30c	....
Bodie	8	7¼	8	7⅜	8⅜	7¼	7½	2¼
Benton	6⅝	4⅞	5⅞	5	6	5⅜	5⅞	5
Bulwer	14⅞	14½	15	14¼	18	16	18	16½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	....	75c	60c	65c	60c	1.05	65c
Belvidere	50c	....	55c	50c	45c	25c	1.40	80c
Booker	40c	30c	40c	20c	45c	40c	45c	55c
Caledonia	3	2.80	2.95	2¼	3½	3	3.10	2.90
California	9⅝	9⅜	9⅝	7⅜	8	7⅞	7⅞	7⅝
Challenge	3.10	2⅞	4.30	2.95	5¼	4	3.95	3
Chollar-Potosi	48½	46	49	46¼	49¾	48	49½	48
Comanche	....	....	....	....	....	....	....	....
Confidence	17½	15⅞	20	15¼	23	17⅞	17½	15¼
Con Imperial	1.10	1.05	1.20	1.05	1.35	1.20	1.35	1.05
Con Virginia	8½	7	8⅝	7⅝	8	7½	7⅝	7¼
Crown Point	5⅝	5¼	6¼	5¼	6⅞	5⅝	6¼	6
Con Washoe	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	....	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	50c	....	50c	....
DeFrees	10c	5c	10c	....	15c	10c	10c	....
Daney	....	....	....	....	....	....	....	....
Day	25c	20c	30c	20c	40c	30c	35c	30c
Eureka Con	27¼	26½	29	27	30¾	29¼	30	29¾
Exchequer	6⅝	5⅜	6½	5⅞	7¼	6⅛	7	6
Endowment	25c	15c	15c	10c	25c	10c	20	15
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4½	4.05	4½	4⅝	6	4.60	5⅝	5
Gila	5c	....	....	....	5c	....	5c	....
Golden Chariot	25c	....	....	....	....	....	....	....
Golden Terra	6	....	5½	5⅜	5½	....	13	5½
Goodshaw	30c	25c	35c	30c	45c	25c	50c	45c
Gould & Curry	14½	12⅞	14½	12⅞	15¼	14½	14⅞	13⅞
Hale & Norcross	18¼	16¼	19	15⅞	21¼	18¼	18⅜	17
Hillside	2	1.95	2¼	2	2¼	2¼	2¼	2
Highbridge	1.65	1¼	1.85	1⅞	1.40	1¼	1¼	1
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	15c	10c	15c	10c	15c	10c
Independence	1.80	1½	1.65	1½	1.80	1½	2	1.80
Julia	3.90	3½	4.05	3¼	4½	4¼	4.20	3.90
Justice	4¼	4	4	3.80	5⅝	4	5½	5¼
Jackson	7½	7	7½	7	7	6½	7½	6
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6⅝	5¼	7⅝	5⅞	8	6¼	6¼	5⅞
Kossuth	40c	20c	25c	20c	25c	10c	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	75c	60c	1.30	70c	2	1.20	1.90	1½
Lady Wash	2½	1½	2	1½	2½	1.80	1.90	1.60
Leopard	50c	25c	85c	15c	90c	85c	1	90c
Leviathan	70c	45c	75c	60c	75c	50c	65c	55c
Leeds	1	....	60c	....	80c	50c	80c	75c
Lee	....	....	....	....	....	....	....	....
May Belle	60c	50c	50c	....	....	....	10c	....
Modoc	60c	50c	....	....	....	....	....	....
Manhattan	3.60	3½	3.60	3¼	3¼	3	3	2½
Martin White	5	4⅞	5¼	5	6½	5½	5	....
McClinton	60c	35c	60c	45c	60c	....	85c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	38¾	34½	37½	36	40½	37¼	40¾	38½
Mides	....	....	....	....	....	....	....	....
Morning Star	3¼	....	3	....	3	2½	....	....
North Con Virginia	7½	6	9½	7	11½	8¼	11¼	9
New York	1	65c	1.10	70c	1.10	85c	85c	60c
Northern Belle	7	6⅜	8	5⅞	8½	7⅝	10	9
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	35c	20c	20c	....	25c	20c
Occidental	1	60c	1	....	....	....	....	....
Ophir	35½	33½	34½	33¼	42	34½	42	39¼
Oriental	50c	....	50c	35c	50c	40c	5c	....
Overman	11	10½	10⅞	10¼	12	11⅞	12	11
Panther	....	....	10c	5c	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	50c	35c	40c	30c	35c	25c	30c	25c
Prospect	....	....	5c	....	....	....	....	....
Raymond & Ely	8	6⅞	6	6⅛	8	6	6½	6⅛
Richer	50c	....	75c	....	60c	....	65c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	1½	90c	....	....	....	....
Savage	14⅞	13⅛	15⅞	13¼	17	15½	15⅞	14
Seg Belcher	22	....	....	....	24½	23	25	24
Sierra Nevada	49½	46¾	48	46	49	40½	49	46½
Silver Hill	2.30	2	2½	1.90	2.90	2½	2.70	2.40
Silver King	7	....	10	....	19	....	9½	9½
Silver Prize	....	....	....	....	....	....	....	....
Succor	1½	75c	1½	1.05	1½	1	1	65c
Summit	2	1½	2	1¾	2½	1.95	2.65	2.15
Scorpion	1.45	1	1.80	1¼	1¾	1.60	1.60	1.40
Solid Silver	65c	50c	70c	60c	70c	65c	60c	55c
South Bodie	25c	....	25c	....	25c	....	30c	....
South Standard	....	....	....	....	....	....	....	....
Star	60c	....	65c	50c	95c	75c	75c	....
St. Louis	70c	55c	55c	50c	50c	....	....	....
Syndicate	....	....	2	....	....	....	....	....
Tioga Con	1½	1.30	1½	1¼	1.78	1½	1.70	1.40
Tiptop	1.20	....	1⅞	85c	1.45	1	1¼	90c
Trojan	45c	40c	45c	35c	45c	35c	35c	25c
Union Con	63	59	56⅞	57	62	61	68	61
Utah	19¼	17½	18¾	17½	19½	17⅞	18	16
Vermont Con	....	....	....	....	....	....	....	....
Ward	85c	75c	85c	70c	1.30	85c	1.40	1.20
Wells-Fargo	20c	15c	20c	15c	20c	15c	20c	15c
Woodville	....	....	40c	25c	30c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	21	19½	25½	19½	27½	21¾	22⅛	20½

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 14.
285 Andes 56@60c
240 Alta 7⅝@7½
205 Alpha 18@18½
260 Best & Belcher 25@25¼
1485 Bullion 8⅞@8⅜
550 Baltimore Con 1
1900 Belcher 7⅞@8½
760 Benton 5⅞@5½
140 Con Virginia 7⅝@7⅞
225 California 7⅝@7⅞
220 Crown Point 6½
4565 Con Imperial 1.15@1.10
375 Caledonia 3.10
290 Con Dorado 65@70c
465 Confidence 17½@16⅞
1045 Challenge 3.80@3.95
50 Chollar 48
510 Dardanelles 5
1790 Exchequer 7@6⅞
350 Flowery 40@35c
340 Gould & Curry 14⅞
300 Geo Douglas 60c
430 Hale & Nor 18@18⅞
125 Justice 5⅝@5¼
765 Julia 4.10
210 Kentuck 6¼
1250 Lady Bryan 1.70
400 Leviathan 65@60c
500 Mexican 39@39½
100 Mackey 2⅞
275 North Con Vir 9½@9⅝
350 N Bonanza 1¾
250 New York 85@80c
250 Overman 12@11⅞
400 Ophir 39¼@39½
1335 Phil Sheridan 30@25c
100 Senator 55c
45 Seg Belcher 24@25
110 Sierra Nevada 47
365 Savage 15@15⅝
1350 Silver Hill 2.60@2.40
1670 Solid Silver 60c
2150 Succor 95c@1
345 Scorpion 1¼@1.60
75 Union Con 61½
800 Wells-Fargo 15@20c
1010 Ward 1.20@1¼
740 Yellow Jacket 21¼@21⅞

AFTERNOON SESSION.
650 Argenta 65@60c
500 Belle Isle 30c
100 Bechtel 65c
225 Bodie 7½@7⅝
100 Belmont 50c
110 Belvidere 1@1.40
40 Bulwer 16½
200 C Pacific 1½@1.45
200 Dudley 80c
450 Day 30c
85 Eureka Con 30
350 Endowment 20c
1600 Fourth of July 35@40c
50 Golden Terra 5½
300 Goodshaw 45c
330 Grand Prize 5@5¼
100 Gila 5c
800 Hussey 15c
200 Hamburg 70c
180 Hillside 2¼@2½
1350 Highbridge 1¼@1.20
390 Independence 1.90@2
235 Jackson 7¼
150 Leopard 90c
125 M White 5½
400 McClinton 50c
350 Minnietta Belle 10c
215 Mono 2
295 Manhattan 2½@2⅞
290 Navajo 25c
550 Paradise 2.10
30 Raymond & Ely 6¼@6½
100 Richer 65c
65 Real del Monte 4
320 S Bodie 30c
330 Summit 2¼@2.15
550 S Bulwer 55@60c
3000 Tuscarora 5c
50 Tiptop 1.10
260 Tioga Con 1.70@1.60

Saturday A.M., Feb. 15.
165 Alpha 17@16¾
120 Alta 7¼
110 Andes 50@60c
600 Albion 50c
275 Argenta 65c
500 Adenda 75c
140 Best & Belcher 24¾@25
1475 Belcher 8@8½
275 Booker 45@40c
545 Bodie 2½@2¼
530 Benton 5⅜@5¼
95 Bulwer 17
350 Belvidere 1
100 Belmont 45c
300 Bechtel 70c
300 Con Virginia 7¾
165 California 7⅞@7¾
360 Confidence 16½
35 Chollar 48@48½
230 Crown Point 6⅝@6½
1200 Con Imperial 1.10
230 Challenge 3.70@3.65
845 Caledonia 3@3.10
190 Con Dorado 70c
1000 Caledonia (B H) 1½
50 Dayton 50c
340 Dardanelles 5½@5¼
300 Dudley 80@75c
260 Day 30c
1660 Exchequer 6¼@6⅝
385 Eureka Con 30@29¾
750 Endowment 20c
1850 Flowery 35@40c
200 Fourth July 35c
315 Gould & Curry 14¾@14⅝
1360 Grand Prize 5½@5⅝
160 Golden Terra 6
410 H & Norcross 16¾@18
100 Hussey 15c
400 Hillside 2
235 Independence 1.95@2
355 Justice 5¼
1005 Julia 4.15@4.20
255 Jackson 6
50 Kentuck 6¼
835 Leviathan 60@65c
425 L Bryan 1.65@1.70
80 Leopard 95c
285 Lady Wash 1.70@1.90
100 Leeds 75c
560 Mexican 39¾@40½
200 Mackey 2.85
100 May Belle 10c
445 Manhattan 2½@2⅞
550 Mono 2@1.95
50 McClinton 40c
100 M White 5
200 Navajo 25c
390 N Con Virginia 9½@9⅞
500 New York 80@75c
800 N Bonanza 1.90@1.85
220 Northern Belle 9⅞@10
1415 Ophir 42@41⅞
260 Overman 11⅞@11¾
200 Plutus 1½
450 Phil Sheridan 30c
65 Paradise 2@2.15
30 Raymond & E 6½
30 Real del Monte 3½
200 Santiago 2.10
370 Savage 15½@15
1420 Succor 90c@1
275 Sierra Nevada 47
380 Silver Hill 2.60@2.65
50 Silver King 9⅞
650 Solid Silver 60c
150 Scorpion 1½
500 S Bulwer 60c
50 South Bodie 30c
300 Summit 2.20
100 Trojan 35c
450 Tiptop 1½
50 Tioga 1.60
50 Tuscarora 10c
170 Union Con 61½
65 Utah 17@16⅞
550 Ward 1.20@1¼
400 Wells-Fargo 15c
1060 Yellow Jacket 22@21½

Monday A. M., Feb. 17.
180 Alta 7½
110 Alpha 15¾
25 Andes 50c
320 Best & Belcher 24¾@24
930 Belcher 7½@7⅝
1910 Bullion 7⅞@7⅛
260 Benton 5¼@5⅜
20 Chollar 48
540 California 7⅞
420 Con Virginia 7⅝@7½
405 Crown Point 6½@6¼
2215 Con Imperial 1.05@1
625 Challenge 3½@3
260 Caledonia 2.90@2.95
120 Confidence 15½@16
100 O Dorado 60c
740 Dardanelles 5½@5¼
1895 Exchequer 6⅜@6
300 Flowery 35c
450 Gould & Curry 14@14⅜
255 Hale & Nor 17½@17¾
730 Justice 5¼@5½
940 Julia 4.05@4.10
55 Kentuck 6@5⅞
805 Lady Bryan 1.60@1½
525 Leviathan 60@55c
620 Mexican 38½@39
100 Mackey 3
210 North Con Vir 9
590 N Bonanza 1.80@1⅞
390 New York 80c
750 Ophir 40@39
385 Overman 11½@11¼
1150 Phil Sheridan 25@30c
200 Plutus 1½
650 Solid Silver 60c
260 Savage 14⅞@14½
20 Sierra Nevada 46½
245 Silver Hill 2½@2.60
600 Succor 95c
150 Scorpion 1½
200 Santiago 2.10
200 Trojan 35c
30 Utah 16½@16
50 Union Con 61
250 Wells-Fargo 20c
500 Ward 1.20@1¼
425 Yellow Jacket 20⅞@20½

AFTERNOON SESSION.
400 Adenda 75c
380 Argenta 60@65c
800 Albion 50c
100 Bodie 7½
50 Bechtel 65c
400 Booker 40@45c
350 Belvidere 1
250 Bulwer 17½
50 Black Hawk 65c
260 Con Pacific 1½
1500 Caledonia (B H) 1¼
300 Day 30@35c
425 Dudley 80@65c
200 DeFrees 10c
125 Eureka Con 30
500 Endowment 20c
115 Grand Prize 5⅞@5½
490 Goodshaw 45@50c
135 Golden Terra 6
500 Giant & O A 4
600 Hussey 10@15c
275 Hillside 2½@2.30
1210 Highbridge 1
160 Independence 1.90@1.95
90 Jackson 7
100 Leeds 80c
180 Leopard 95c@1
450 Manhattan 2.65@3
125 Mono 2@1.90
220 McClinton 70@60c
125 Northern Belle 9½@9⅝
200 Navajo 25c
550 Paradise 2½@2.15
50 Real del Monte 3½
70 Star 75c
200 S Bodie 30c
200 S Bulwer 60c
360 Summit 2.20@2¼
20 Silver King 9½
140 Tioga Con 1.60@1.70
650 Tiptop 1.10@1

Tuesday A. M., Feb. 18.
180 Alpha 17⅝@17
305 Alta 7½@7¼
260 Andes 55@60c
105 Best & Belcher 24¾@24½
1305 Belcher 7⅝
1310 Bullion 7¾@7¾
935 Benton 5¼@5
405 California 7½
330 Caledonia 3
635 Con Virginia 7⅝@7½
3125 Con Imperial 1.05@1.10
20 Chollar 48
375 Crown Point 6¼@6¼
360 Confidence 16
325 Challenge 3½@3.40
300 Dardanelles 4@4½
2230 Exchequer 6⅜@6⅝
100 Flowery 35c
150 Gould & Curry 14¼@14⅝
400 Geo Douglas 55@60c
320 H & Norcross 17¾
610 Justice 5¼
960 Julia 4.15@4.10
20 Kentuck 6
250 Kossuth 15c
1585 Lady Bryan 1½@1.55
75 Lady Wash 1.90
470 Leviathan 55c
230 Mexican 39½@39⅝
200 Mackey 3.15
475 New York 80@85c
305 North Con Vir 10⅞@11¼
705 N Bonanza 1.80@1.90
1330 Ophir 40¾@42
205 Overman 11½
100 Phil Sheridan 30c
15 Seg Belcher 26½
525 Sierra Nevada 48
695 Savage 15@15½
485 Silver Hill 2.65@2.70
600 Succor 90@80c
470 Scorpion 1½@1.40
300 Santiago 2½
900 Solid Silver 55@60c
150 Trojan 30c
170 Utah 16½@16¾
260 Union Con 62½@68
300 Wells-Fargo 15c
900 Ward 1½@1.30
320 Yellow Jacket 21½@21¾

AFTERNOON SESSION.
850 Adenda 75c
650 Argenta 65c
100 Albion 50c
300 Belle Isle 30c
215 Bodie 7⅞@7½
200 Booker 40c
150 Bechtel 70@60c
150 Belvidere 1
300 Bulwer 17⅞@18
150 Belmont 55c
600 Black Hawk 1@1.05
425 C Pacific 1⅞@1.80
925 Caledonia (B H) 1.30
110 Dudley 95c@1
370 DeFrees 10c
50 Endowment 20c
50 Eureka Con 30
200 Fourth July 30c
200 Giant & O A 4
450 Goodshaw 45@50c
250 Grand Prize 5@5½
400 Gila 5c
100 Golden Terra 7
705 Hussey 10@15c
2440 Highbridge 1
160 Hillside 2½
240 Independence 1.90
185 Jackson 7
745 Leopard 90c@1
365 Mono 2@1.90
225 McClinton 70@85c
725 Manhattan 3
100 Minnietta Bell 20c
60 Northern Belle 9½
575 Navajo 20c
90 Oriental 5c
400 Paradise 2¼@2.20
100 Real del Monte 4
55 Raymond & Ely 6½
700 S Bodie 30c
595 Summit 2¼@2.20
200 S Bulwer 55@60c
25 Silver King 9½
350 Tioga Con 1.60@1½
3000 Tuscarora 5c
400 Tiptop 1

Wed'sday A.M., Feb. 19.
150 Andes 55c
1815 Alpha 16½@20¼
100 Alta 7½@7⅝
630 B & Belcher 24½@24¼
2290 Bullion 7⅝@7½
530 Belcher 7⅝@7½
600 Benton 5½@5
20 Chollar 48½
225 Con Virginia 7⅝@7½
400 California 7⅝@7⅞
295 Crown Point 6¼@6
285 Caledonia 3@2.95
5715 Con Imperial 1.15@1.20
205 Confidence 16⅞@16½
120 Challenge 3½@3.40
200 O Dorado 30c
2210 Exchequer 6⅞@6½
100 Flowery 35c
300 Geo Douglas 60c
300 Gould & Curry 14@13⅞
345 Hale & Nor 17@17¼
160 Justice 5¼@5⅝
940 Julia 4@3.90
60 Kentuck 5⅞@5⅞
1000 Leviathan 65@60c
560 Lady Bryan 1.65@1⅞
300 Lady Wash 1.60@1.65
260 Mexican 40½@40¼
300 Mackey 3¼@3.15
435 North Con Vir 10⅞@10⅝
465 New York 70@61c
10 N Bonanza 1.90
145 Overman 11½@11⅜
345 Ophir 40½@40¼
300 Plutus 1½
1800 Phil Sheridan 25@30c
900 Succor 80c
460 Savage 14@14½
150 S Nevada 48
320 Scorpion 1½@1.40
980 Solid Silver 55c
200 Silver Hill 2.60
200 Trojan 30c
120 Utah 17½@17⅞
380 Union 66½@67½
600 Wells-Fargo 15c
450 Ward 1.30@1¼
295 Yellow Jacket 21½@21⅝

AFTERNOON SESSION.
1000 Albion 50@40c
1100 Argenta 65c
275 Bulwer 17⅞@18
315 Bechtel 60@65c
360 Bodie 7⅞@7½
100 Belvidere 90@80c
960 Black Hawk 75c@1
100 Belle Isle 30c
600 Booker 35@45c
1725 Caledonia (B H) 1⅞@1.70
375 C Pacific 1⅞@1.80
235 Dudley 65@70c
70 Day 30c
230 Eureka Con 30
1100 Endowment 20@15c
300 Fourth July 30c
90 Grand Prize 5
580 Goodshaw 45@50c
100 Golden Terra 6½
300 Giant & O A 4½@4
770 Highbridge 1
450 Hussey 10@15c
100 Hamburg 70c
495 Hillside 2½
20 Independence 1.80
150 Jackson 7
10 Leopard 90c
200 McClinton 75c
10 Manhattan 3
150 Minnietta Bell 20@25c
245 Mono 1.90@2
95 Northern Belle 9¼@9
600 Navajo 20c
705 Paradise 2.30@2.35
200 Real del Monte 3½
130 Raymond & Ely 6¼@6½
150 Star 75c
260 Summit 2.65
480 S Bulwer 60@65c
450 Tiptop 90c@1
910 Tioga Con 1.40@1½

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Best & Belcher M Co	Washoe	13	1 00	Jan 3	Feb 6	Feb 26	W Willis	309 Montgomery st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Lady Bryan M Co	Nevada	1	50	Jan 2	Feb 2	Feb 24	C V Hubbard	Cosmopolitan Hotel
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
Mayhelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Jan 16	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Mono G M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Panther M Co	Nevada	10	10	Jan 2	Feb 6	Feb 28	J W Pew	310 Pine st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	5	50	Jan 3	Feb 6	Feb 28	W E Dean	203 Bush st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Advance M Co	California	2	50	Dec 19	Jan 28	Feb 28	B Lengley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Feb 25	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VauBokkelen	309 Cal
Catawba M Co	California	1	20	Jan 3	Feb 6	Feb 24	B S Kellogg	306 Pine st
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 17	Apr 2	J T McGeoghegan	316 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N C Walton	324 Pine st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
MariposaLand & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	Safe Deposit Build
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Nevada Gravel M Co	California	5	05	Dec 12	Jan 15	Feb 24	J Penteeost	511 California st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
Noonday M Co	California	1	10	Jan 2	Feb 6	Feb 27	G A Holden	310 Pine st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Mar 24	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	Mar 1	April 5	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Arizona-Utah G & S M Co	Arizona	O H Spencer	408 California st	Annual	Feb 28
Almaden Quicksilver M Co	California	John F Mahoney	207 Sansome st	Annual	Feb 24
Glasgow S M Co	Nevada	Jno Crockett	203 Bush st	Annual	Feb 25
Northern King M & M Co	Arizona	J F Glover	318 Pine st.	Special	Mar 13
Pioneer Con M Co		J M Buffington	309 California st	Special	March 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Feb 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Feb 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., Feb. 13.
170 Alta 7⅞@7⅝
75 Andes 50@40c
115 Best & Belcher 25@25¼
2235 Belcher 7⅞@8½
2250 Bullion 8½@8⅛
270 Benton 5⅞@5⅝
240 California 7@7⅞
385 Con Virginia 7⅝@7½
1590 Crown Point 6⅝@6⅞
80 Chollar 48½@48
3975 Con Imperial 1.20@1¼
325 Confidence 18@17⅞
535 Caledonia 3@3.15
1290 Challenge 4@4.10
100 Dayton 50c
545 Dardenelles 5@4.90
1950 Exchequer 6⅞@6⅞
2650 Flowery 45@50c
215 Gould & Curry 15@14⅞
200 Geo Douglas 60c
165 Hale & Nor 18¾@18⅞
30 Justice 5⅞
630 Julia 4½
155 Kentuck 6½@6⅝
30 Kossuth 10c
250 Lady Wash 1.90@1.95
740 Lady Bryan 1⅞@1.80
930 Leviathan 70@60c
90 Mexican 39@38⅞
100 Mackey 2.65
300 New York 85c
430 North Con Vir 9½@9¼
590 N Bonanza 2@1.90
150 Ophir 39
580 Overman 11⅞@12
930 Phil Sheridan 30c
220 Sierra Nevada 48@47⅞
220 Savage 15⅞@15⅝
2710 Succor 1
460 Silver Hill 2.80@2⅞
307 Scorpion 1.65@1.60
1000 Solid Silver 70@65c
100 Trojan 40c
165 Union Con 61¼@61½
1100 Wells-Fargo 15c
435 Ward 1½
1505 Yellow Jacket 22½@21⅞

AFTERNOON SESSION.
800 Argenta 65c
650 Albion 50c
30 Bulwer 16½
380 Bodie 7⅞@7½
250 Bechtel 60c
225 Belmont 45@40c
410 Booker 40@45c
50 C Pacific 1½
2450 Caledonia (B H) 1¼@1.30
100 Dudley 90c
450 DeFrees 10c
100 Day 40c
80 Eureka Con 29¾@30
525 Endowment 20c
500 Fourth July 30c
1100 Gila 5c
125 Goodshaw 40@50c
610 Grand Prize 4¼@4½
50 Hussey 10c
10 Hamburg 70c
150 Highbridge 1½
330 Hillside 2¼
1255 Independence 1.90@1.95
390 Jackson 7@7⅞
100 Leeds 75c
105 Martin White 5½
800 Mono 2
345 Manhattan 2½@2⅞
350 McClinton 50c
150 Minnietta Bell 10c
300 Navajo 20@25c
60 Northern Belle 8⅞@8⅞
1050 Paradise 2@2.10
165 Real Del Monte 4
300 Raymond & Ely 6¼@6½
85 Silver King 9
200 S Bulwer 60c
50 S Bodie 30c
350 Summit 2.15@2.10
1440 Tuscarora 5c
695 Tioga Con 1.60@1.80
105 Tiptop 1.10@1.20

Thursday A.M., Feb. 20.
190 Alta 7
145 Alpha 20
50 Andes 60c
95 Best & Belcher 24½@24¼
2060 Bullion 8@7⅝
150 Belcher 7⅝
345 Benton 5¼@5
390 Caledonia 2.95@2.90
3210 Con Imperial 1.30@1.20
300 C Dorado 20c
90 California 7⅝
170 Challenge 3⅞@3.70
490 Con Virginia 7⅞@7½
105 Confidence 17½@16⅞
230 Crown Point 6⅛@6
550 Dardanelles 3.20
810 Exchequer 7@6⅞
250 Flowery 40@35c
200 Gould & Curry 14½
425 Geo Douglas 60c
270 Hale & Nor 17⅞@17⅞
310 Justice 5½@5⅜
1280 Julia 4@3.95
35 Kentuck 5⅞
100 Kossuth 20c
25 Lady Wash 1.60
620 L Bryan 1⅞@1.70
200 Leviathan 60c
150 Mexican 40⅞@40¼
100 Mackey 3¼
600 New York 60@65c
180 N Con Virginia 10⅞@10⅝
750 N Bonanza 1.80
180 Ophir 41¼@41
310 Overman 11¼@11
1935 Phil Sheridan 30@25c
300 Plutus 1.60
100 Sierra Nevada 48¼@48
675 Savage 14⅞@14½
485 Silver Hill 2.60@2.55
920 Succor 70@65c
610 Solid Silver 55c
950 Trojan 35@25c
70 Utah 16@17⅞
205 Union Con 67½
750 Wells-Fargo 15c
900 Ward 1.40@1.35
1260 Yellow Jacket 22½@22

AFTERNOON SESSION.
1030 Argenta 60@65c
200 Albion 40c
465 Belmont 40@50c
100 Belvidere 70c
80 Bodie 7⅞@7½
100 Bulwer 17⅞
650 Black Hawk 90c@1
405 Bechtel 60c
1200 Belle Isle 30c
150 Booker 40c
465 C Pacific 2
485 Caledonia (B H) 1⅞@2
500 Dudley 65@75c
445 Day 30@35c
200 DeFrees 10c
1050 Endowment 15c
50 Eureka Con 28⅞@29
1500 Fourth July 30@35c
30 Grand Prize 5
570 Goodshaw 50c
200 Giant & O A 4.10
50 Golden Terra 8½
370 Hussey 25c
700 Highbridge 90c@1
50 Hillside 2⅞
20 Jackson 7½
25 Leeds 75c
150 Leopard 80c
5 Martin White 8½
70 Mono 1.95@2
200 Manhattan 3
150 Minnietta Bell 25c
875 McClinton 75@80c
320 Northern Belle 8½@8⅞
900 Navajo 20c
100 Oriental 10c
625 Paradise 2¼@2.65
20 Raymond & Ely 6
100 Real del Monte 3½
320 Summit 2¼@2.30
330 Star 65@75c
50 Silver King 9½
50 S Bodie 30c
200 S Bulwer 50c
75 Tiptop 1
510 Tioga Con 1.40@1½
100 Tuscarora 5c

Pacific Board—Latest Sales.

Wed'sday A.M., Feb. 19.
170 Alpha 20¼@20
25 Alta 7⅞@7½
150 Belcher 7⅝
20 Best & Belcher 24
230 Bullion 7⅞
365 Con Virginia 7⅝
4600 Con Imperial 1.20@1¼
40 Chollar 48½@48⅝
380 Crown Point 6@6.05
200 California 7⅞@7⅝
50 Caledonia 2.95
330 Exchequer 6⅞@6.60
110 Gould & Curry 14⅛
150 Hale & Nor 17¼@17⅞
40 Justice 5½@5¼
10 Kentuck 6
100 Mexican 40½@40⅞
140 Ophir 40⅞@40½
50 Overman 11⅝
20 Savage 14½
30 Sierra Nevada 48½@49
70 Silver Hill 2.60@2.55
50 Union Con 67
70 Yellow Jacket 21⅞

AFTERNOON SESSION.
210 Alta 7½@7⅝
20 Andes 50c
10 Alpha 20¼
25 Bullion 8@7⅝
10 Belcher 7⅝
25 Benton 5⅜@5.15
50 Bodie 7½
340 Con Imperial 1.30@1¼
10 Caledonia 2.95
5 Con Virginia 7⅞
10 Confidence 17
60 Challenge 3.70@3⅞
90 Crown Point 6⅛
170 Exchequer 6⅞
200 Geo Douglas 55c
80 Justice 5⅝@5½
150 Julia 3.90@3.95
20 Kentuck 6
250 L Bryan 1.85@1.90
50 Mackey 3⅜
20 Mexican 41@40½
100 N Bonanza 1.90@1.95
200 New York 60c
10 Ophir 41
200 Phil Sheridan 26c
100 Paradise 2¼
370 S Bulwer 65@60c
40 Silver Hill 2.55@2.60
150 Solid Silver 60c
50 Trojan 30c
200 Tuscarora 5c
50 Twin Peaks 8c
1050 Ward 1.30@1¼
200 Wells-Fargo 15c
40 Yellow Jacket 22⅞@22⅞

California Board—Latest Sales.

Wed'sday A.M., Feb. 19.
30 Alpha 18½@18⅝
50 Alta 7¼@7½
500 Ætna 25c
30 Best & Belcher 24¾@24⅝
50 Belcher 7¾@7⅝
30 Bullion 7⅞
35 California 7⅞
20 Con Virginia 7⅞
410 Con Imperial 1.15@1¼
40 Crown Point 6½
130 Challenge 3½
190 Caledonia 3
70 Dardanelles 3¼
35 Exchequer 6½
100 Endowment 19c
100 Favorite 72½c
30 Gould & Curry 14½@14¼
300 Gila 5c
500 Globe 3c
45 Hale & Norcross 17¼
40 Justice 5.40@5.45
125 Julia 4
100 Kossuth 20c
30 Mexican 40⅞
75 Mackey 3.15

100 Mint	17c	300 Coso Con	5c
200 Newark	30@35c	30 Caledonia	3
40 Ophir	41	120 Challenge	3.70
350 Phil Sheridan	27@26c	100 Enterprise	1
1700 Pictou	25@25c	40 Exchequer	7½
40 Savage	14½@14½	60 Gould & Curry	14½
200 Santiago	2½	125 G Deposit	75@50c
150 Senator	40c	400 Globe	3@2c
110 Silver Hill	2.55	300 Gila	5c
20 Sierra Nevada	48½	30 Hale & Nor	17½
1600 Twin Peaks	9@10c	150 Hussey	60c
7000 U Flag	1c	20 Julia	3.90
120 Woodville	30c	40 Justice	5½
500 Wales	1½@2½	150 K K Con	1½
35 Yellow Jacket	21½	120 Lady Bryan	1.90
		200 Mint	17@18c
AFTERNOON SESSION.		50 Mexican	40¾@40½
100 Alexander	4½	300 Newark	25c
200 Atlantic	50c	150 New York	60c
30 Alpha	20	40 Ophir	41½
30 Alta	7½@7½	825 Phil Sheridan	25@30c
200 Andes	55@57½c	30 Savage	14½
200 Almaden Q	95@90c	30 Sierra Nevada	48
700 Ætna	25c	350 Santiago	2½@2½
50 Bullion	8@8½	25 Silver Hill	2.55
20 Best & Belcher	24½	200 Tiger	87½c
20 Belcher	7½	1000 Twin Peaks	15@10c
30 Con Virginia	7½	100 Ward	1.30
40 Crown Point	6½	75 Wales	2½
325 Con Imperial	1½@1.30	100 Wells-Fargo	16c
40 California	7½	30 Yellow Jacket	23

Mining Share Market.

The stock market seems to lack symmetry. It is out of shape, irregular in its movements and uncertain in ite interests. One day a move is made in a particular eection of the Comstock, and tho market becomes euthusiatic; then all of a sudden, without waruing this section is dropped, and becomes flat and dull, while another epot is chosen to go through the eame routine. The week opened very quietly and the dullness continued throughout. There was an occasional wave, but it was scarcely more than a riffle. Early in the week there was a slight rise in Ophir and a decline in Jacket and Sierra Nevada. The deal in Yellow Jacket seems to have worn out its chief manipulators entirely. Deeperate efforts have been made to entbuse tbe market, but the outside is decidedly wary, while the ineiders have been careful not to state that the movemente aro hased ou the actual development of the mines, tbey have given out that Eastern men are liable to become good customers, and that along the Comstock there never were better indications, etc., till eome, at least, have been led to invest. Here, perhaps, lies the eecret of the wavering etate of the market. Everytbing is "indications," and nothing but indications. People will not inveet their money largely on the mere possibility thus expressed. At tho close, there was a slightly firmer eondition of the market, with a riee in Union and Sierra Nevada.

Bullion Shipments.

Since our last issue, we have noticed the following bullion ehipments:

Tybo Con., Feb. 10th, $4,277.54; Christy Con., Feb. 11th, $4,968; Highbridge, Feb. 14th, $8,108; Hillside, Feb. 15th, $5,020; Independence, Feb. 17th, $6,000; Paradise Valley, Feb. 17th, $3,390; Grand Prize, Feb. 16th, $12,500; Ophir, Feb. 10th, $22,343.81; 15th, $23,110.28; Con. Virginia, Feb. 15th, $41,696.70; Extra, Feb. 4th to 15th, $7,326; Christy Con., Feb. 18th, $6,199; Hillside, Feb. 19th, $5,580.

ARTESIAN WELLS FOR ARIZONA.—We have long advocated the sinking of artesian wells, believing tbe character of our valleys and mountains warranted the belief that siuking would result in succees. In this connection our many readers will no doubt be happy to learn, that Col. C. P. Sikes, manager of tbe Calabasas Land and Mining eompany, bas just eompleted tbe purebase of a eomplete maehinery for boring of artesian wells upon their property at Calabasas, and it is now in transit from Joliet, Ill., and expected to arrive here eome time next montb. This machinery and tools, witb all the beet modern improvements and appliances for drilling rapidly, and to a great depth, will be accompanied by Mr. Jas. McQuiggle, as superintendent. Mr. Jas. McQuiggle, we learn, is a man of great experience in "well drilliug," througb all kinde of ground and rock. Tbe work of tbe drilling will be commenced in March upon the town site of Calabasas. Tbis work wben commeuced will bo vigorously pusbed, nigbt and day, until flowing water is reacbed, if iu order to do that they have to go dowu to a deptb equal to that of tbe level of the sea.—*Arizona Star.*

STATIONARY POWER FOR THE MILLION.—By referenee to another eolumn, it will be seen that tbe Pacific Power Company advertises a room with steam power to let in their new building in tbis city. This is a good opportunity for machinists and small manufacturers, and ougbt to be a great convenieneo botb to tbem and otbers, whose husiness ealls for a ebeap but at the same time limited power for propelling lathos and otber macbinery necessary to such trade. Steam-motor power ou a small scale is not alwaye obtainable, and this offer will be a bonanza in the hands of an enterprising man, and mueh economy and saving will be effected by its acceptanee.

THE great undertaking of penetrating the Alps with a tunnel at St. Gotbard has now progressed 40,443 feet, or 7.65 miles. There etill remain 9,000 feet, or 1.74 miles to be bored, wbicb it is boped to complete in a year, making tbe tuunel nearly nine and a half miles long, by far the most gigantic work of the kind. The original estimate for tbe work was $17,000,000, but it is now expected to cost no less than $45,000,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

THE MONTERICHARD.—*Dispatch*, Feb. 15: Drifts are being run at the 250 level; the ledge maintains its width of from two and a half to three feet, and the rock looks still better than that takeu from above. The mill ie constantly running, but another clean-up will not be had till the first of next month. The regular pay day will uot be interfered with by the recent etopping of the mill.

THE ONEIDA.—This mine is running ouly 20-stamps. The indicatione are favorable for it to soon reach its former prosperity. Quite a handsome shipment of bullion was made a few days ago.

THE MOORE MINE.—Everything looks encouraging at this mine, the ledge being ahout eeven feet, and tbe rock above tho average grade. The mill is now running in good style.

DOWNS.—*Ledger*, Feb. 15: This mine continues to yield largely. The rock taken from it has yielded a higher per ceut. of gold than any worked in Amador county for many years. A clean-up was made in tbe early part of the week, from 105 tons of rock. The bullion obtained was $5,000; within a fraction of $50 per ton. The levels look as well as ever; all the indications favor the idea of a permanent mine.

CALAVERAS.

THE SHEEP RANCH MINES.—*Chronicle*, Feb. 15: Rock of extraordinary richness is being taken from the Chavanne mine, the shaft having reached tbe depth of 400 feet. The ledge is developing splendidly. A fine mill is owned in connectiou with the mine, which is now at work and will be kept constantly employed in the future. At the well-known Wallace & Ferguson mine, the new 20-stamp mill is in full operation. Since the work of re-timbering tbe shaft was completed operations have been greatly facilitated and conducted witb increased energy and vigor. It gives employment to about 75 men and crushes, ou au average, 35 tons of high grade ore per day.

MINING SCRAPS.—The shaft in the Champion at West Point is in 500 feet. This gives the mine a hundred feet of backs—roek euough to keep tbe mills running iudefinitely. At tbe San Pedro, Glencoe district, the new shaft is down 105 feet and the pumps and hoisting works are in position ready for operations. Water bas heen struck in the shaft, but the new machinery is sufficient to prevent inconvenience from that source. At tbe Banner, a crusbing of 160 tons of ore in Garland's mill bas been lately completed.

MONO.

THE STANDARD CON.—Bodie *Standard*, Feb. 14: There is probably no truth in the rumor that the Standard and Bulwer companies have consolidated their interests uuder a new incorporation. It is more tban likely that the new incorporation implies a consolidation of those intereets held by the original Standard company by deed, acquired subsequent to the first ineorporation. Whetber tbis iucludes all of the West Bullion ground, we are not quite certain, but believe such to be the case. The new main sbaft is located in this subsequently acquired territory, developments in wbich have been so valuable as to practieally double tbe value of tbe entire Standard property, to say nothing of the new finds in the original ground east of tbe main lode. Altogetber, tbis is probably tbe correct theory of the new incorporation, witb 100,000 instead of 50,000 sbares. Tbe *Chronicle*, February 13th, says of this mine: There bas been no ebange in the east crosscut from main shaft. Tbe total leugth is 219 feet—progress for the week, 31 feet. South drift from this erosscut has been extended during tbe week 20 feet—total length, 175 feet. The ledge is three feet wide and looks well. The east crosscut (300 level) is in 195 feet—progress since last report, 17 feet. No change in the ground passed through. North drift from this crosseut bas been run 19 feet duriug the week; length 35 feet. The ledge is two feet wide of good ore. Nortb drift on West Standard is in from crosseut, 44 feet; the ledge is two feet wide and looks well. Ledge in south drift is 18 incbes wide of good ore. The drift is in 52 feet. Nortb drift on Cook ledge is in 110 feet from soutb line. Ledge is 18 incbes of very good ore.

BULWER.—Tbe ledge in tbe south drift (300 level) is three feet wide aud looks well. Tbis drift is in from the winze 140 feet. The ledge in upraise is two feet wide of good ore. Have resumed work in eouth drift (200 level). The ledge is two feet wide and looks well. The Stonewall stopes are looking as well as nsual.

TIOGA.—Opened 420 station and started east drift, which is in ten feet. Sinking helow tbe 420 station—down 18 feet, and continuing west crosscut at 320 level. Ground in sbaft eontiuuing about the same, but more favorable for working.

JUPITER.—Shaft down ahout 240 feet; ten feet more aud a statiou will be opened.

MONO.—Drift at 400 level in 26 feet. Not sinking on account of water, of which 40,000 gallone are daily disebarged. Troublesome nature of ground prevent rapid headway.

CON. PACIFIC.—Work on this mine during the past week was ehiefly centered upon tbe winze sinking on lode No. 2. This winze is 63 feet from the mouth of tbc old tunuel, 3½x7 fect in size and nearly 50 feet in depth. The ore holds out fully in quantity—20 inches in width—and is improved in quality. A crosscut east to No. 1. and a winze thercon is projected. This will develop the property pretty thoroughly, aud enable the company to extract an abundaut and regular supply of ore until the new shaft south, and its connections, are established. A whim is to be erected and the work of siuking and timbering coutinued.

NEVADA.

PLUM VALLEY MINE.—*Herald*, Feb. 15: The buildings for the hoisting works and the mill are completed, and the machinery being rapidly placed in positiou. Everything will be in running trim in threo wceks. J. C. Culver, Esq., former President of the Masouic Savings and Loan Association, is Superiutendeut of the mine. The mill contains 10 stamps and gold-saving apparatus of the latest and most improved kind. It is estimated that the rock can bo worked at an expense of $3.50 to $4.00 per ton. There is a large quantity of ore in sight that will yield $15 or more per ton.

BLOOMFIELD ITEMS. The North Bloomfield company have their mine running in full blast, with tbree monitors throwing their huge streams against the gravel banks. Brockmeyer & Co. have plenty of water now, and are rushiug off the gravel from their claim. Tbe Derbec mine ie hoisting its regular quantity of rich gravel, and has uo trouble in getting water to make its washings.

THE INDEPENDENCE LEDGE.—Grass Valley *Union*, Feb. 16: The old Independence tunnel, a few hundred feet west of the old Gold Tunnel company's mill, is now being re-opeued and worked by Meesrs. Damon & Prentice. A shaft sunk from the top of the hill ie down 200 feet. Their object is to connect tbe shaft and tunnel to give a free circulation of air. They have already a well-defined ledge of 10 inches, the last crushiug of which paid $50 per ton.

DAMAOE TO A MINE.—The Nevada Hill (lately the Bell) mine, recently shut down for the season on account of the inability of machinery to haudle the eurface water, whicb flowed in freely. Since the late etorm the ground around the ehaft indicates that there has been serious caving in the underground workings, the extent of which cannot be ascertained until the mine is again pumped out.

PLACER.

IOWA HILL ITEMS.—*Herald*, Feb. 15: Water is greatly needed in this locality. Tbe mines are worked by the hydraulic process, and therefore it is an indispensable necessity. Last Saturday the Orient Mining Co. eet off a bank blast of 165 kegs of Hazard powder; it was in tbree chambers; was exploded by electricity, aud was very effectual. The Iowa Hill Canal Co. have 50 men digging a ditch from Humbug canyon, a distanee of six miles, designed to bring water to their large reservoir a little above Iowa Hill, from which a number of mines, besides their own, get their supply of water.

PLUMAS.

MINING NOTES.—Butterfly Cor. *National*, Feb. 8: The Bushman claim is ruuning a drift on good pay gravel, but working under great disadvantage, owing to the depth of the ehannel, but has very flattering prospects. Horace Smith, working a short distance below Bushman, is tunneling to strike a chaunel left when the main Blackhawk was first worked. The Blackhawk miuing claim is uot at present working, owing to the cold weather, but ie prepared to make a good showing as soon as the weather moderates. On tbe Blaekhawk Bar, Mr. Robert Holmes is working over tbe old bedrock, results not known. On the Barker ravine, Messre. Whitney & Weatherby bave run a bedrock tuunel a distance of 100 feet or more, and have etruck gravel that prospects good to every pan. Bowers & Co. are working iu very good gravel. Over on the Butterfly side is the placer claim known as the Mound elaim, worked by Kimball, Crowell & Co. They are working from an ineline, bave considerable pay dirt on the dump, and are anxiously waiting for tbe rain.

SHASTA.

VARIOUS CLAIMS.—Inyo Cor. Reading *Independent*, Feb. 13: In the South Fork district there is a decided improvement; work is going ahead in good earnest, tbe excitement steadily inereasing. Tbree more very ricb gold-bearing ledges bave been discovered, on which good forees are hard at work. A specimen from one mine was literally covered with free gold. A few loads of such quartz would satisfy almost any reasonable man. Mr. J. P. Wright and Anderson & Co. are taking out the same kind of ore from tbeir new mine, the Sherman. The ledge is about four feet thick and prospects well all through. The gold is fine, but in abundanee. O. Eugle is now drawing ore from his Dayton mine, whicb is being reduced by Mr. Peck. Balou & Hubbard havo got their arastra completed and are now taking out and working ore from their own mine. Up tbe hill Mr. L. Provost & Co. are running a tuunel to etrike and cut tbe Detroit mine deep down.

TRINITY.

BULLYCHOOP DISTRICT.—*Journal*, Feb. 15: The Bullychoop aud Occidental tunnel is now in 150 feet and progressing favorably, although only about two feet is being made in 24 houre, owing to the bard cbaracter of tbe roek. A good traek is laid in the tunnel and a car run thereon. Other companies in the district not doing much at present. Mr. St. Clair has a four-etamp mill ready to hegin operations as soon as the snow goes off and a pipe ean be laid. John R. Knox has 100 tons of good rock from the Central Lode, which he will have crushed at the mill. The Rattlesnake and Excelsior company is down ahout 50 feet in each mine and find the lodes three feet wide, from wbich they obtain excellent prospects. Sillcox & Co. have found a new lode on the other side of the hill, which they have christened tbe "New Jerusalem."

NEVADA.

WASHOE DISTRICT.

Our usual Washoe letter haviug failed to come to hand iu time for this issue, we substitute, therefor, latest letters received by the various companies in this city from superintendents on the Cometock—the dates mentioued, being all of the present month.

CALEDONIA.—Letter of 15th: During the past week the east drift has been extended 28 feet, and the vertical winze has been suuk and timbered 20 feet; the formation in east drift is mucb harder than it was the first part of the week.

ALPHA.—Letter of 16th: The situation at the mine continues the same as last reported. The flow of water from the face of tbe joint drift on our 2400 level (east) contiuues about the same, hence we have not yet resumed work at tho point.

CHOLLAR.—Letter of 15th: At the Chollar-Norcross-Savage shaft has been sinking steadily during the past week, and the work has made good progrese, considering tbc large amount of water—eome 71,500 gallous per day tbat we have hoisted. Rock on west side of shaft is somewhat harder.

JULIA.—Letter of 15tb: Slow progress has been made in lowering the accumulated water which bas risen above 2000 level. It is now antieipated from the general aspect of everytbing connected with tbe pump and rode, that the result will be more satisfactory at tbe eud of the coming week.

MEXICAN.—Letter of 15th: The joiut Union Con. winze on our 1605 level has been eunk and timbered 14 feet during the past week; total depth, 224 feet on slope. The material passed through has become extremely hard rock. On our 2000 level the main north drift has been advanced 63 feet; total length from our south line 424 feet. No change in material.

BEST & BELCHER.—Letter of 16th: The 1700 level joint east drift was extended 36 feet during the week, and is now in 508 feet. West joint crosscut 1900 level was advanced 20 feet, and is now in 84 feet. Tbe face ie in a mixture of quartz and porphyry, but assaye notbing. Owing to the strong flow of water the Osbiston shaft was only eunk 10 feet. It is now down 460 feet in good sinking grouud if it was dry. Everything is working well.

HALE & NORCROSS.—Letter of 17tb: Yesterday at 9 A. M. tbc pump rod at the second pump broke, eince tben the work of repairing the rod has been going ou and will be completed some time this eveuiug. The water stands 50 feet below tbe 2000 level. The winze down from 2000 level is now 20 feet deep; considerable water is coming in.

BULLION.—Letter of 17tb: During the past week we have opened a station in the incline at tbe 2150 level, from this station we will start a drift south during the first part of tbis week to connect with the 2000 level of the Imperial. Tbis connection will be made hy tbe first day of March, barring accidents. Tbe formation in the roof of the incline is soft vein propbyry aud low grade quartz. On the 2400 level the combination Bullion-Excbequer drift bae heen advanced a distanee of 28 feet, making ite tetal lengtb 167 feet. Tbe formation still contiuues the same favorable cbaracter. Everytbing about tbe miue running well.

WARD.—Letter of 15th: The east erosscut, whieb was started on Monday last, has been advanced 22 feet to date; total length, 424 feet. On fore part of the week the general ebaracter of the ground encountered consisted of large blocks of bird'e-eye porpbyry. The past few days, however, a change has taken place of a softer nature, containing clay and streaks of quartz.

BELCHER.—Letter of 15tb: To the length of the south drift on tbe 2360 level 30 feet have been added tbe past week; total lengtb, 669 feet. The south drift from the 2560 station is now in 83 feet, having been run 45 feet the past week. The 2560 etation is about finiehed and the ventilation on this level is now excellent, owing to tbe connection made with tbe Crown Point.

UNION CON.—Letter of 15th: Mexican joint winze on 1600 level has been eunk and timbered 14 feet during past week—total deptb 224 feet on slope. Material eucountered is extremely bard rock. Still ongaged in work of repairing aud wideniug 1450 Sierra Nevada drifts. Flow of water from east drift has decreased to about three and a half inches.

OVERMAN.—Letter of 15tb: Sinee our last report the vertical winze has been sunk and timbered 19 feet; north lateral drift bas beeu extended 31 feet; face is in a promieing eharacter of quartz. Tbe new ebaft bas been sunk and timbered 20 feet. Tbe water coutinues very troublesome. We bope to get tbe ekeet running by the last of the week, and then we ean handle the water without mnch tronble.

GOULD & CURRY.—Letter of 15th: For tbe past week the east drift on tbe 1700 level was exteuded 36 feet, and is now in 508 feet from the lateral drift. On tbe 1900 level the differ-

Continued on page 124.

The Cone-bearers, or Evergreen Trees of California.—No. 5.

[Written for the PRESS by J. G. LEMMON.]

Cypress, Arbor-Vitæ, Cedar, Redwood, and Big Tree.

Tribe II. (of the first great order of *Pinaceæ*.) *Cupresseæ*—Cypress family. Cones composed of a few peltate or thickened scales. Leaves small, scale-like, pointed. A large and interesting family of 4 gencra and 10 species, separated by characters of the cone into two sections.

Section A.—True Cypress.

Cones with the peltate scales opposite on a depressed axis. Three genera and eight species.

First genus *Cupressus*, a classical name, or from the is'e of Cyprus, where it is abundant. Ornamental trees found on or near the coast; cones small, globular, knobby; 6 species.

1. *Cupressus macrocarpa*, Hart. "Monterey cypress." Tbe popular lawn and border tree of the coast towns. A symmetrical, conical tree, 20 to 60 feet high, with dark green foliage, hearing profusely large (1 to 1½ inches tbick) persistent cones, composed of a few pairs of pyramidal scales, the interstices filled with numerous angular, black seeds.

2. *Cupressus McNabiana*, Murr. "McNab's cypress." Resembles described species, but is smaller, 10 to 20 feet high, with denser, shining foliage; coues one-quarter to one-half inch.

3. *Cupressus Lawsoniana*, Murr. "Lawson's cypress." Resembles *C. macrocarpa*, but with finer, recurved foliage, and smaller (one-quarter inch) cones. "The most graceful and pleasing cypress known."

4. *Cupressus Nutkænsis*, Hook. "Yellow cedar." A valuable timber tree of the northern coast, 80 to 100 feet high; cones the size of peas.

5. *Cupressus fragrans*, Kellogg. "Port Orford cedar, or ginger pine" of the Oregon coast, and sparsely reaching California. A noble tree, 100 to 150 feet high, yielding valuable aromatic timber for cabinet work. Cones very small.

6. *Cupressus Goveniana*, ——? "Dwarf cypress." A favorite tree, or, rather, shrub, 10 to 15 feet high, and fruiting when very young. Cones the size of small peas. The species *Lawsonia* and *Nutkænsis* have been put into another genus hy some, and called *Chamæ cyparis*.

Arbor Vitæ.

Second genus *Thuja*, from the Gr. *thuia*, to smell, alluding to its odor. "Arbor Vitæ" (improperly called "White cedar" at the East). Beautiful trees, with fan-shaped foilage placed vertically; leaves in opposite pairs, small, imhricated and unequal; cones, ovate and leathery. Only one species in California—on the northern coast.

Thuja gigantea, Nutt. "Giant Arbor Vitæ." A noble and valuahle tree, often attaining 200 feet, with a diameter of 10 to 15 feet; timber, very soft and durahle; cones, one inch long, of four pairs of scales.

Cedar.

Third genus *Libocedrus*, from *libanus*, incense, and *cedrus*, the cedar. "Incense cedar." Symmetrical trees of slow growth and fragrant timher. Foliage, fan-shaped, hut placed horizoutally; cones, elliptical, of four to six very dissimilar pairs of scales. Only one species in California, widely but sparsely dispersed over all its mountain rauges at low elevations.

Libocedrus decurrens, Endl. "Post cedar." A handsome tree of pyramidal outline, fast tapering upward. Timber splits easily, endures exposure to weather, as fence posts, or takes a fine polish in cabinet work. Leaves in opposite unequal pairs and decurrent on the flattened hranches (whence the specific name). Cones, elliptical, one inch long, of six scales in three very dissimilar pairs, the second pair longest and fertile, hearing each two long-winged seeds.

Section B.—Taxodiæ, Redwoods.

Cones, elliptical, ohlate, of few pyramidal, peltate scales, disposed spirally on an elongated axis, though the cone may he globular, as in the *Taxodium* of the East. One genus of two gigantic species peculiar to California, alone representing a past prodigious flora.

The generic name *Sequoia* was given hy Endlicher hecause this genus is a lone follower (*sequi*, to follow) of vast colossal forests. By others said to he derived from "Sequoya," the celebrated Cherokee Indian; hut this is no douht an afterthought and unworthy to he kept up.

Redwood.

1. *Sequoia sempervirens*, Endl. "Redwood" of a limited section of the Coast range 100 miles north and south of the Golden Gate. This immense tree, only exceeded hy the other species—*S. gigantea*—often attains a hight of 200 to 300 feet, with a circuit at hase of 60 to 100 feet. Very tenacious of life, the injured trees sprout anew from any part as readily as willows; yet, through the avarice and carelessness of man, they are rapidly disappearing. Timher, the well known light and durable "redwood." Leaves in two ranks, lanceolate, one-half inch long, poiuted; cones one-half to one inch long.

Big Tree.

Second species, *Sequoia gigantea*, Torr. "Big Tree," found only in about 20 groves on the western slope of the high Sierra, from Calaveras county to Fresno. All things considered, this is the largest tree in the known world. Some species of eucalypti in Australia are taller, and perhaps specimens may he found girting more at the swelled-out hase, hut they generally taper fast upward, have short limbs and very thin bark. The giant sequoia is often found 300 to 400 feet bigh, with a circuit at base of 80 to over 100 feet, the vast trunk but slightly tapering upward to the crown, where it suddenly divides into branches, being often found without a limb for 200 feet; its soft, reddish, thick, cedar-like bark deeply furrowed from top to bottom, giving the shafts the appearance of magnificent fluted columns propping their broad, shield-like crowns of light, gauzy foliage against the sky. Leaves on young trees acerose, one-half inch long; on limbs of matured trees reduced to pointed scales; cones the size of a hen's egg, hut knobby, without prickers, and composed of about 36 large pyramidal scales, their apexes eutering the elongated core of the cone, aud the interstices between them filled with 80 to 120 flat, winged seeds, resembling those of tbe common parsnip.

The big trees of California have justly been made the theme of glowing descriptions hy travelers, and hy scientists as well. The writer has published several articles in the PACIFIC RURAL PRESS and in Eastern journals, to which the reader is referred for elahorate descriptions, especially going to disprove their reputed great age of 3,000 to 4,000 years.

Washingtonia vs. Wellingtonia.

Before leaving the subject now, however, I wish to advert to a matter relating to the big trees, growing out of the pride I take in every noble product of my adopted State. I allude to the hahit the English have of misnaming our giant *Sequoia* by calling it "Wellingtonia." The history of its naming, re-naming and misnaming is substantially as follows: When first discovered in 1852 fragmentary specimens were sent to San Francisco and the East, and to England. Dr. Kellogg, of San Fraucisco, discovered what he took to be distiuguishing generic characters, and he very patriotically named the apparently new genus "Washingtonia." Dr. Lindly, the leading botanist of England, also pronounced (1853) the tree to he the type of a new genus, and joyfully called it "Wellingtonia." The two names were published to the world with descriptions of the tree about the same time, and scientists of the two countries rallied loyally to their standard bearer, shouting "Wellingtonia" or "Washiugtonia," as tbey happened to he on either side of the Atlantic. Meanwbile seeds had been sent abroad, where they readily grow, and English horticulturists distributed plants by the million over their vast Empire, thus disseminating their name world-wide. But a few months after Drs. Torrey and Gray, of New York; Endlicher of London, and De Caisne, of Paris, determined from fuller specimens that the wonderful tree belonged to an old well-established genus, the *Sequoia*, or redwood, and, as is the rule, most botanists at once adopted the proper name. But the name of "Wellingtonia" has got hold of the English mind (and pride), and while they are forced to say *Sequoia* when talking with American scientists, they cling tenaciously to the misnomer when talkiug with the uneducated, or with Englishmen who are willing to he unscientific rather than give up a name commemorating their Irou Duke.

Sir Joseph Hooker's Position.

I wrote recently to Sir Joseph Hooker, President of the Royal Society of England, and the most eminent botanist of the age, protestiug against the unscientific use of "Wellingtonia," and asking where he allowed the weigbt of his great influence to rest. I woke up a full-blooded Englishman. Hear him:

"Wellingtonia" is a misnomer in a scientific sense," he replies, "hut not in a vernacular sense. The name "Wellingtonia" is rooted as deep in Englaud and Europe as the "hig tree" in its California soil, and the people of England and Europe who know the hig tree only hy the name of "Wellingtonia" are as numerous as the leaves on the biggest *Sequoia*. Colloquial languages are means, not ends, and the conveniences of the day and hour will carry the day in the face of all argument and all science. It is only wisdom to accept the inevitable. You might as well attempt to restore the Dutch name of New York to the American vernacular as to force "Sequoia" upon the English and continental vernacular. After all, what does it matter," he concludes (very much, I say,) "the botanist knows that *Sequoia* is the right name, hut the uneducated know only "Wellingtonia." That serves the purpose. To him one name is as good as another," (not so, my English special pleader,) "and 'first come, first served,' is his motto."

Rebuttal.

Now it happens that some English so-called scientific works, like "Gordon's Pinetum" and the like, describe the big tree under the name of "Wellingtonia," used, not as the vernacular or common name, hut as the botanical or scientific name, admitting in the same paragraph that the genus is not well founded, yet persisting in keeping it up, encouraged thereto no douht by the quasi endorsement of such eminent authority as Hooker. Our botanical hooks and records abound in cases similar to this of the *Sequoia*, *i. e.*, where a plant has been called by a certain name until familiar and adopted into the vernacular, but wider research and better instruments for examination have compelled in time a change of name hy competent authority, and all persons are expected to yield to the dictum, whatever tbeir preferences. This is correct, scientific procedure. If it were not so there would he an end to all improvement, all advancemeut, in a word, to all science; and the predileotions of no clans, people or nations should he allowed to stand in the way of scientific facts. As well might we Americans, preeminently entitled to our pride in commemorating the "Father of bis Country," he still clamoring for "Washingtonia," because our botanist first described and named it such. But no, it is characteristic of Americans to correct abuses before tbey become "inevitable." I know that Sir Joseph means to be fair and honest, but I doubt if he would acquiesce so readily in his "inevitable" if he were not an Englishman. As I am an American, born on tbe same soil with the hig trees, I would rather that Americans reject this English misnomer, and promptly call our famous trees by their proper name of "Big Trees," or by their botanical name of *Sequoia gigantea*.

[To be Continued.]

Igneous Meteors.—No. 1.

[Written for the MINING AND SCIENTIFIC PRESS.]

Ærolites, Fire-Balls, Shooting-Stars.

Igneous meteors are luminous bodies whicb suddenly appear in the sky, usually at a great bight above the surface of the earth, and sboot across the heavens with immense velocity, and are sometimes accompanied with the fall of meteoric stones or ærobtes. As regards meteoric stones, it is evident that the striking phenomena attending tbeir fall upon thc earth—the hrilliant luminous display, the violent detonations, the tremeudous momentum with which the hot masses bury themselves in the ground—were well calculated to arrest the attention, and to stimulate the imagination of mankind in all periods of bistory. We find, accordiugly, that these hodies have been observed to fall in all ages of the world. Probably the earliest account we have of any one of them is to be found recorded in Joshua, chap. 10, verse 11; "at any rate, the phenomenou referred to in that verse can he interpreted by reference to some of the more modern falls of meteoric stones."

One of the most remarkable falls recorded in ancient history is that of the Thracian stone, mentioned by Pliny in chapter 58 of Second Book on Natural History. It fell near Ægospotamos, in Thrace, about 467 years hefore the Christian era. He describes it as being of a burnt color, and as heing held in veneration by the inhabitants of the country. This is probahly the stone which Anaxagoras, tbe Clazomenian philosopher, predicted, it is said, would one day fall from tho sun. In Butler's "Hudibras" this event is thus noticed.

> "For Anaxagoras long agone
> Saw hills, as well as you i' th' moon;
> And held the sun was but a piece
> Of red-hot iron, as big as Greece;
> Believ'd the heav'ns were made of stone,
> Because the sun had voided one:
> And, rather than he would recant
> Th' opinion, suffered banishment."

Some persons think, with appareutly very good reason, that the image which fell down from Jupiter, and was worshipcd by the Ephesians, (referred to in Acts, chap. 19, verse 35,) was a meteoric stone. Another ancieut and memorable ærolite is now at Mecca; for the celebrated black stone, *Hajar el Aswad*, that forms an ohject of adoration of the pilgrims to thc Kaaba, at Mecca, is doubtless one of these bodies.

Varieties of Igneous Meteore.

At one period it was a question among scientific men whether ærolites, fire-balls and shooting-stars constitute a single class of igneous meteors. Shooting-stars are of all degrees of size and hrightuess, and some occur which exceed Jupiter or Venus, or even the moon in hrilliancy. In some of them the globular form can be easily recognized; these are, in every respect, similar to fire-balls or *bolides*. In fact, it is impossible, from their appearance, to make any distinction hetween the larger shooting-stars and the smaller so-called fire-halls. Again, the larger fire-balls often explode into fragments, the parts scattering across the sky in different directions. In some cases, terrific detonations are heard over an extensive region of country a short time after the visible explosion; and, at times, from these detonating meteors stouy fragments come down, scattering themselves over a region of many miles in extent, and frequently striking the ground with sufficient velocity to bury themselves two or more feet deep. These fragments constitute ærolites or meteoric stones. Hence, modern physicists are disposed to regard all of tbese igneous meteors as having a similar origin and character, though differing in size, in color, in hrightness, in chemical composition, etc. Additional evidence of the correctness of this conclusiou is derived from the hight and velocity of all kinds of igneous meteors.

Hight.

By stationing two observers 50 or 100 miles apart, to observe and record the track of the same ærolite, fire-hall, or shooting-star, as it is projected from the different points of observation on different parts of the sky, the actual altitude of these igneous meteors can be determined with more or less precision. The observations of Brandes, of Leipsic; Benzenberg, of Dusseldorf; Wartmann, of Switzerland; Newton, of New Haven, and others, have thus determined their hight to vary from 15 to 140 miles from the surface of the earth. When the larger fire-halls come lower down than 30 miles they usually send down fragments to the surface of the earth.

Velocity.

From the angular extent of the track of the igneous meteor, the time of its transit, and its distance from the observer, it is easy to determine the velocity of its motion. For meteoric stones, the observations of Glaisher, Petit, Daubree, and others, indicate that tbese bodies traverse our atmospbere with velocities varying from four to forty miles per second. With respect to shooting-stars, the observations of Benzenberg, Quetelet, Herrick, Newton, and others, assign to them velocities fully equal to, if not surpassing, the velocities of meteoric stones. Estimating their mean velocity at about 30 miles per second, it is evident that it far surpasses the speed of any terrestrial motion, being more than 100 times the initial velocity of a cannon ball. Tbe bigher velocities assigned to shooting-stars, as compared with meteoric stones, probably arises from the circumstance that the smaller meteoric masses on entering the upper and highly attenuated atmosphere of the earth, are dissipated and volatilized before their motion is greatly retarded hy the resistance of the air; while the larger masses, constituting ærolites, descending into the denser strata of the atmospherc, encounter such an enormous resistance as to vastly reduce tbeir velocities before reaching the surface of the earth. Hence it is quite possible that the various varieties of igneous meteors may enter our atmosphere with approximately similar velocities, but that tbe subsequent retarding influence of the resistance of the air creates inequalities of speed, which manifests itself more especially in the larger masses traversing the lower strata of the atmosphere.

Luminous Traine.

Many fire-balls and shooting-stars leave a luminous train behiud them, similar to a bright band of phosphorescent light. These trains, for the most part, disappear in a few seconds; but sometimes they continue for several minutes. In the case of actual fire-balls, Olbers observed trains whicb continued for six or seven minutes; Brandes, in one instance, 15 minutes; Prof. Newton, of New Haven, saw one in which the duration of train was 45 minutes; and cases have heen reported in whicb more than an *hour* elapsed between the extinction of the fire-hall and the disappearance of the luminous train. This bright narrow bar of light is frequently several degrees long; it usually retains its elongated form for a fraction of a minute, and then becomes *curved*. If it lasts several minutes, the train gets *twisted* forms, the result, doubtless, of winds in the upper air and of currents produced by the transit of the meteor itself.

Chemical Constitution.

On examining and comparing the chemical constitution of these meteoric masses, which reach the surface of the earth, the first circumstance that strikes us as remarkable, is their perfect resemhlance to each other in their *chemical composition*. Chemical analysis gives, in almost every instance, the same substances, combined in very nearly the same proportions. This seems to be the case with both of the two great classes of meteoric stones, viz: the *stony* and *metallic* ærolites. These common and constant characters indicate a *common origin*.

The New Yellow Jacket Shaft.

Work has recently been commenced, says the Virginia *Enterprise*, in the Yellow Jacket new shaft from the drift on the 2200 level to meet the workmen who are coming down. The rock at the bottom where the work of raising has been commenced is found to be exceedingly hard. In drilling a single inch the point of a drill is blunted as though it had heen battered upon a block of steel. This rock is a species of black porphyry, much resembling basalt in appearance. It is merely a narrow belt or rih. Air for the use of the miners is supplied through a large pipe from the 2000 level of the old works, and is furnished hy a blower tbat is run in the mine hy water power. The air is carried a distance of 1,400 feet.

It is hoped that the new shaft will prove a downcast and it is thought that it will so turn out, as the air in the new shaft is quite cold, while at the old works it is very hot; also, in the Imperial and otber mines with which there are connections. As this hot air rushes to the surface through the various old shafts with great force, it will undoubtedly draw the cold air from the new shaft to the westward. This will be a good thing for the new shaft and not a had thing for the old mines, as it will bring into their lower levels a great volume of pure cold air.

A strange thing about the Yellow Jacket new shaft is its coldness at the bottom, notwithstanding its depth and the great heat of the rock through which it is passing. The men are obliged to work with their coats on, owing to the cold, while the rock in which they are at work is intensely hot, as also is the little water that is found.

At the depth of 2,165 feet a standard thermomcter was placed in a drill hole 33 inches in depth, when a temperature of 133° was shown. This is much hotter than any rock found in the Sutro tunnel. The highest rock temperature in the Sutro tuunel has been 110°.

It is found that some belts or strata of rock are hotter than others. The temperature of the rock at the depth at present attained has not been tested, therefore it may he cooler thau above. In the end of the 2200 drift, at the shaft, it is very hot, however. In extending the air pipe a day or two since the men carried in two joints coupled together and it was all that the best seasoned among them could do to remain long enough to put them in place.

Until recently it was thought that there yet remained 50 feet of drift to he run to get under the shaft, but a survey made showed it to be under the shaft. It appears that the hlock of 50 feet was taken out hy Supt. Taylor previous to his resignation.

The Engineer.

Railway Building for the Coming Year.

A correspondent of the *Railway Age*, who has been largely engaged in railway building, takes a very enthusiastic view of the prosperity of that business in the immediate future. He anticipates a vast influx of population into the Western States and Territories, during the next few years, by reason of the present business depression and unsettled political condition of Europe, which will both add largely to the receipts and furnish cheap material and labor for construction purposes. Speaking of the coming immigration, he says:

During the past five years, commencing with March of this year, there will be a tide of immigration setting in from the East, and by the East I mean not only our own Puritan New England, but from the healthiest, strongest and best element of the Eastern countries—Prussia, Norway, Sweden, Schleswig-Holstein, etc., an agricultural people, seeking homes of their own. One million of them are on the Western prairies now. They write home (we will say) 10,000 letters a year. These 10,000 letters, couched in different languages, are repeated 10,000 times, and finally reach the ears of twice as many more. Hence, these people will come to the country where they can make a home competence for their wives and families.

Now, this being so, it is self-evident that means of access must be furnished to the cheap lands of Dakota, Minnesota, Arizona, Kansas and southwestern Kansas, as well as Missouri, the Indian Territory, and the West, even to the Pacific ocean.

On the question as to the development of the country and construction of railways, he says: Immigrants in coming to new countries always seek the same latitudes. The Swede and Norwegian want Minnesota, as well as do many of our hardy people from the Eastern States. The German wants central Wisconsin, but goes most everywhere, as does the American. The Englishman is conservative, and "waits." All these people will seek as they come, rapid transit, and railways are the most rapid. For this reason, the vast multitude that are coming westward year by year will be increased this year, and the next and the next, until there will be smiling homes and cottages and school houses and churches, in all the west, southwest and northwestern country, even to Alaska, which Mr. Seward was laughed at for purchasing for a less sum than a New York capitalist can get into good society on. Hardly a lady to-day but is petting the Alaska seal sacque she wears.

Leadville, Colorado, and the mines in Montana, and the general development of mining interest, with the accompanying influx of population, demands roads. Also quick communications of wealth taken from the earth, both in mining and agriculture, give means to build roads. Capital is going into the development of these mines, and they are yielding immense profits since improved machinery has been put into them.

Agricultural, mineral and animal products alone will increase the mileage of construction for years to come. This year it will be increased 2,000 miles over 1878. This will include many narrow-gauge roads as well as standards.

Irrigation in Tulare.—Assistant State Engineer, A. C. Warfield, Jr., informs the Fresno *Expositor* that his labors, during the past season, have been devoted to running grade lines and making a complete topographical survey of the county along the foothills from King's river to the Kaweah, and from the Kaweah to Tule river, and thence to White river. Also a survey and examination of King's river from the foothills to the railroad, including an examination of the various canals diverging therefrom, and measurement of their capacity, velocity, etc. For greater accuracy, on all the principal rivers, from the Merced to Tule river, surveys have been made at two points, one near the foothills and the other near the railroad; and gauges have been established at these points in order to determine the amount of water flowing in the various streams at different seasons of the year. Rain gauges have also been established at various points, and the rainfall will be from time to time compared with the rise of the water in the river, so as to determine the influence on the various streams. The information thus obtained is so costly that individual enterprise could not afford to seek after it, and hence the necessity of the State taking hold of it. It will be of great value in determining accurately the water supply of this valley.

"On to the Rio Grande."—Mr. Wm. Hood, chief engineer of the Southern Pacific, says the *Arizona Citizen* of Jan. 18th, arrived in town with his wife on Saturday last and took up their quarters at the Palace. On Monday Mr. Hood and a small party left for El Paso, Texas, and will make a preliminary survey for the purpose of determining upon the most practicable route for the railroad from Arizona through New Mexico to the Rio Grande.

The Metropolitan Elevated.—The Metropolitan Elevated Railway Company, of New York, on Jan 21st, awarded the contract for the construction of its East Side line from the Battery to Harlem.

Useful Information.

A Method for Mending Broken Castings.—Mr. C. de Laharpe gives a method for mending broken castings, which may, in many cases, prove valuable in an emergency. It consists of heating the two pieces together by a stream of molten cast-iron until the parts near the line of breakage commence to melt. At exactly that point the flow of cast-iron is stopped, and a small quantity of metal is left behind, which, in chilling, unites the two parts. If the operation is well conducted, the piece thus mended will break more readily at any other part than the new seam. It is necessary, in order to be successful, to induce melting of the broken edges over their whole length, and therefore the thickness of the casting must not be too small in comparison to its length, nor should there be, in the direct vicinity of the fracture, any marked irregularities of thickness. The broken part must also be perfectly independent of the rest, or else the expansion and contraction will cause breaking. The Chinese have noticed this method of mending broken cast-iron vessels from time immemorial.

Self Luminous Clock Dials.—The clocks with illuminated dials which made such an impression at the Paris exposition, were perfectly luminous in the dark if exposed to the light during the day. President Morton, of the Stevens Institute of Technology, has recently analyzed the substance with which the dials were coated, and found it to consist of nothing but sulphide of calcium, attached by means of some resinous medium like varnish. This substance is a phosphorescent quality never before equaled. One of the dials was still visible in total darkness after having been shut up in a box for five days. Prof. Morton suggests that if further advances should be made in this direction, it is easy to imagine some wonderful results, before which Mr. Edison's new electric burner would fade into insignificance. Thus if our walls were painted with such a substance they would absorb light enough during the day to continue luminous at night, and thus render all sources of artificial light useless. The coloring of houses on the outside with a like material would also obviate need of all street lamps.

Depreciation of Coal by Storage.—A case having come before the Bohemian courts, it was found that bituminous coal stored 12 months depreciated as follows: 1. English Peases West coal suffered no depreciation. 2. Ibbenbueren, Westphalian coal lost 1.4% in weight, 6% in calorific value and made 4.6% less of coke. 3. Dortmund coal lost 2.6% in calorific value and made 2.1% less of coke. 5. Gelsen Kirchen coal 0.4% loss of weight, 0.6% loss of calorific value and 2.1% loss of yield of coke. 5. Borgloh coal respectively 2.6% and 1.5%. Experts have testified that a loss of 2%, in transportation by cars, was not extraordinary for bituminous coals.

Lining for Boilers.—Mr. Frantz Beuttgenhach gives the following recipe for the preparation of a coating for the inside surface of boilers to prevent the formation of scale: Gradually dissolve 5 lbs. of a mixture of 25 parts of colophonium, 2½ parts of graphite, and 2½ parts lamp black in 40 lbs. of boiling gas tar, adding about 1 lb. tallow. The solution is diluted with about 50% of petroleum and applied in a warm state. It has a pungent smell and should be put on rapidly, the precaution of using closed lanterns being necessary. Its effect is to cause the scale to come off in large flakes when picked.

Solidifying Petroleum.—The *Engineer* says: "It may be useful to note that the lightest petroleums may be partially solidified by mixing them with an aqueous decoction of soapwort. A mucilage forms which is so thick that the containing vessel can be overturned without any portion running out. In this form might it not be useful for some lubricating purposes? If a few drops of phenic acid are stirred into the mucilage, it soon becomes liquid again."

Brass Solder for Iron.—Melt the plates of brass between the pieces that are to be joined. When the work is very fine the parts to be brazed should be covered with powdered borax, melted with water so that it may mix with the brass powder which is to be added to it. Expose the piece to a clear fire in such a manner that it shall not touch the coals and let it remain till the brass begins to run.

Cast-Steel.—If a piece of cast-steel be made red-hot and is quenched in cold water it will become longer, but if the same operation be performed upon a piece of wrought-iron it will become shorter. The precise amount of the alteration, or its variation in different qualities of each metal, has never been determined, although it is of great importance in workshop manipulation.

Lead Explosions.—Many mechanics have had their patience sorely tried when pouring lead around a damp or wet joint, to find it explode, blow out, or scatter, from the effects of steam generated by the heat of the lead. The whole trouble may be stopped by putting a piece of resin the size of the end of a man's thumb, into the ladle and allowing it to melt before pouring.

Fermentation of Grape Juice.—This fermentation is exclusively due (according to M. Pasteur) to the presence of cells of yeast on the surface of the grapes whither the air has brought them. If these cells be suppressed, fermentation should be thereby rendered impossible. Now, in the Jura, it is found that the grapes do not bear any traces of these cells until the end of July. Hence if they are then protected from the dust of the air, it should be possible to bring them to ripeness without the juice being afterwards able to ferment. On this supposition M. Pastear placed grapes in inclosures where all access of atmospheric dust was rigorously prevented. More simply, he enveloped grapes in wadding, raised previously to a temperature of 100° C. He showed in the French Academy grapes ripened under these conditions, and he affirmed that one might crush them and keep them any length of time at the suitable temperature without the least fermentation taking place.

Black Finish for Brass.—Optical and philosophical instruments made in France often have all their brass surfaces of a fine dead black color, very permanent and difficult to imitate. The following, obtained from a foreign source, is the process used by the French artisans: Make a strong solution of nitrate of silver in one dish and of nitrate of copper in another. Mix the two together and plunge the brass into it. Remove and beat the brass evenly until the required degree of dead blackness is obtained.

We produce 50 bushels of grain per head, estimating our population at 40,000,000, while Europe, with a population of not quite 300,000,000, produces only 16 bushels per head, and Great Britain only four bushels per head. It being estimated that the average consumption of grain per head is 15 bushels, we produce three times as much as we require, Russia not twice its wants, and Great Britain not much over one-fourth her requirement.

Good Health.

A Dangerous though Popular Eye-Water.

It is a popular impression that a dilute solution of "sugar of lead," or acetate of lead, is a perfectly harmless application for any slight inflammation of the eyes. The time was when it was so regarded by physicians, who were in the habit of ordering a little acetate of lead dissolved in rose water, with perhaps a few drops of laudanum added, for these ocular ailments. But the use of the lead salt for this purpose was long ago condemned by the best authorities, and most physicians are now aware of the fact. In domestic medicine, however, new ideas are slow in replacing the old ones that have come down from the grandmothers, and sugar of lead is still a favorite basis for home-made eye-waters.

A recent article in the Philadelphia *Medical and Surgical Reporter*, by Dr. W. S. Ross, gives a succinct statement of the reasons why this use of lead salts is dangerous. The Doctor says that the great danger of the use of lead in the eye is that a deposit often takes place on the cornea, especially if the cornea is in the least abraded, from whatever cause. Ulceration of the cornea is a very common occurrence, especially where there is high inflammation in the conjunctiva and sclerotic. If the acetate of lead is used, in solution, in an ulcerated condition, it does not matter of what strength, there will be a deposit of albuminate of lead the entire extent of the cornea denuded.

The opinions of quite a number of distinguished medical writers are quoted to the same effect. One writer says: "This bad effect may result from a single application. The deposit is extremely apt to fix itself on ulcers of the cornea. It attacks every abrasion on the slightest denuded surface. Hence, when such exist, acetate of lead should never be used."

This deposit resembles wet chalk, and can be removed only with difficulty and at considerable danger to the sight of the eyes, especially if the patient is advanced in years.

Bee Stings for Rheumatism.—The *Praeger Wochenblatt* contains the following in regard to the cure of rheumatism by the means of bee stings. The correspondent says that his wife having suffered so much as to be unable to enjoy any rest or sleep for the space of six months, the right arm being almost lame, preventing the sufferer from doing any household work, making her even unable to dress or undress herself, and having heard that a farmer, quite incapacitated by rheumatism, had been accidently stung by bees, and thereby got entirely cured, he persuaded his wife to try this remedy, as the pain from the sting of the bees would not be greater than that already suffered. Three bees were therefore laid and pressed upon the right arm for a considerable time, in order that the poison bladder of the insects should entirely empty itself. The effect produced was astonishing, as the lady, even on the first night, was enabled to enjoy a long, good sleep, the first time for at least six months, the racking pain being entirely gone. The arm was, of course, swollen greatly in consequence of the sting, but the swelling gradually disappeared upon the application of some cooling lotion. All pain was gone, the lame arm recovered its previous vigor, and not the least sign of rheumatism has since showed itself.

The Necessity of Plenty of Sleep.

A writer in *Scribner*, considering "The Relations of Insanity to Modern Civilization," speaks of the loss of sleep as a prominent cause of insanity. He says: "During every moment of consciousness the brain is in activity. The peculiar process of cerebration, whatever that may consist of, is taking place; thought after thought comes forth, nor can we help it. It is only when the peculiar connection or chain of connection of one brain-cell with another is broken and consciousness fades away into the dreamless land of perfect sleep, that the brain is at rest. In this state it recuperates its exhausted energy and power, and stores them up for future need. The period of wakefulness is one of constant wear. Every thought is generated at the expense of brain-cells, which can be fully replaced only by periods of properly regulated repose. If, therefore, these are not secured by sleep; if the brain, through overstimulation, is not left to recuperate, its energy becomes exhausted, debility, disease, and, finally, disintegration supervene. Hence, the story is almost always the same; for weeks and months before the indications of active insanity appear, the patient has been anxious, worried and wakeful, not sleeping more than four or five hours out of the 24. The poor brain, unable to do its constant work, begins to waver, to show signs of weakness or aberration; hallucinations or delusions hover around like floating shadows in the air, until finally disease comes, and—

> "'plants his siege
> Against the mind, the which he pricks and wounds
> With many legions of strange fantasies,
> Which in their throng and press to that last bounds
> Confound themselves.'"

Cooked Celery for Rheumatism.

The many who are fond of the crisp leaf stems of celery would hesitate before reducing it to the estate of "cooked stuff," and yet it is said to be of good taste and to have "virtues" besides. An English writer proclaims cooked celery as a cure for rheumatism, which it certainly will not harm if it fails to cure. We read as follows: Celery, cooked, is a very fine dish, both as nutriment and as a purifier of the blood. I will not enumerate the marvelous cures I have made with celery, for fear the medical men should, like the corn dealers, attempt to worry me. Let me fearlessly say that rheumatism is impossible on such diet. Plainly let me say, cold or damp never produces rheumatism, but simply develops it. The acid blood is the primary cause and the sustaining power of evil. While the blood is alkaline there can be no rheumatism and equally no gout. I must return to cooked celery. Cut the celery into inch dice; boil in water until soft. No water must be poured away unless drunk by an invalid. Then take new milk, slightly thicken with flour and flavor with nutmegs; warm with the celery in the saucepan; serve up with diamonds of toasted bread round dish, and eat with potatoes."

Sanitary Uses of Gunpowder.—A correspondent writes us from the Sandwich Islands saying that during a long life spent in tropical fever districts he has been able to escape infection and miasma by the use of gunpowder, supplemented by a few simple precautions against sudden changes of temperature, sunstroke, bad water and the like. He uses no water that has not been boiled and afterwards kept from air contact; but his main reliance is upon the practice of burning a thimbleful of gunpowder in his bedroom and very small quantities in his trunk, wardrobe, etc., so as to keep his clothes in an atmosphere feebly charged with gunpowder gas. In Madagascar, Reunion, Mauritius, the east coast of tropic Africa, and other fever-smitten lands he has found such simple means a sure preventive of epidemic and epidemic diseases, and has thereby been often brought to the philosophic reflection that gunpowder is destined to invert the aim intended by its fabrication.—*Scientific American.*

Singular Case of Poisoning.—The *Sutter Banner* says that three children of James C. Gray, residing near Yuba City, came near poisoning themselves during the week by chewing the inside bark of the common black locust tree, several of which their father was trimming. The children, aged respectively three, six and nine years, had picked up the twigs, and stripping the inside bark from them, chewed it, swallowing some of the juice. Soon after they were attacked with vomiting, and after thus relieving their stomachs, sat around in a kind of dazed condition, conscious, but with an evident wish to be undisturbed. Dr. Hamlin was called in, and under his ministrations they have about recovered. The fact that poison exists in this tree will doubtless be news to many of our readers, and we publish this that others may exercise care in its handling.

To Cleanse the Hair.—Ammonia should not be used on the hair; it injures the gloss and softness, causing the hair to become harsh and dry. The best way to cleanse the hair, and keep the scalp healthy, is to beat up a fresh egg, and rub it well into the hair, or, if more convenient, rub it into the hair without beating. Rub the egg in until a lather is formed; wet the bands in warm water, softened with borax; by the time a lather is formed, the scalp is clean; then rinse the egg all out in a basin of warm water containing a tablespoonful of powdered borax, after that rinse in one of clear warm water.

MINING AND SCIENTIFIC PRESS.

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The Week.

From the north, south, and center of the State cheering statements come to us of abundant rainfall and encouraging prospects for crops. The length and steadiness of the storm has entirely quieted the uneasy feeling of despondency which had crept over the agricultural districts, and not only the grain grower and fruit producer, but the stock raiser and the wool grower partake of the general feeling of encouragement and prophecy better times. After the months of doubt and anxious expectancy as to the action of Congress on the Chinese question, this week has brought no satisfaction in the passage of the Anti-Chinese bill through the Senate and its return to the House. There is little doubt but that it will become a law. Among mining men some excitement and indignation is manifest over the action of the Bonanza companies in turning hot water into the Sutro tunnel. The Bodie strike is over. The miners have failed in their undertaking and the loss is mostly on themselves. From the East the welcome news comes that the definite treaty between Russia and Turkey has taken effect, and that the Russian troops have been ordered home. The citizens of Alaska have appealed for aid against the incursions of the Indians; and it is humiliating that their request should have to be made to the British corvette *Osprey*, no American force being near enough to protect them. It is just to our Government, however, to state that it has already troops under way to the scene of difficulties to look after its interests. The collision of the local ferry boats in the fog looks strongly as if there was extreme carelessness somewhere, and it is almost a miracle that no lives were lost.

The Snake River Mines.

We have lately received letters from parties in different sections of the country asking for information in regard to the Snake River mines; some of these parties inquiring also about the agricultural lands in that region, the general features of the country, cost and best routes for getting there, climate, seasons, etc. We have within the past few months published a number of editorial articles, communications, extracts from other papers, etc., upon this subject. Still, as these mines are beginning to attract a good deal of attention, having been widely noticed, of late, in the Idaho and Utah press, we will endeavor to give such additional information as may best meet the inquiries above alluded to.

Snake river, which takes its rise in the Wind River range, the highest portion of the Rocky mountains, runs first west for 300 or 400 miles and then turning north, flows about an equal distance, where it unites with the Columbia. From the last of May till the 1st of August, when the snow is melting in the mountains, it carries as much water as the Sacramento at ordinary stages, but much less during the rest of the year, being lowest from the last of September till the 1st of May. Its principal confluents are a North and a South Fork, which unite after they have left the higher mountains. The main stream runs first for about 200 miles through a canyon with sloping banks, deep but not difficult to approach. It then enters and, for the next 100 miles, flows through a gorge having nearly perpendicular walls, rendering approach at many places impossible, and everywhere difficult. There is at the Fort Hall Indian reservation a considerable extent of good land, with some patches elsewhere along the river; the total amount of land fit for cultivation being however very small. The Snake is a timberless stream, as much so as any other river on the continent for its length. There are forests of the kind usually found in the Wasatch and Rocky mountain ranges along its upper portions, but below this it is almost wholly without useful timber of any kind whatever. There are, in places, a sparse growth of cottonwood, some willow, and at a few points small, scattered groves of spruce and pine, one of these being found just below the great Shoshone falls, the spray from which has caused their growth, there being from this point not another tree of any kind in sight. Further down the stream some coniferous trees are also met with. For the most part, however, the inhabitants along and near the Snake have to depend upon sage brush for their fuel.

Besides being so nearly timberless, the country through which this river flows is exceedingly dry and barren. Not only are the fertile bottom lands along it of limited extent, but the entire plateau for a hundred miles or more on either side is an absolute desert, with only here and there a productive strip of land bordering the streams that at long intervals make into the main river. The country produces a great deal of bunch grass, but has so little water that it is almost useless for grazing purposes. There are some fine stock ranges on Raft river and other of the lower confluents of the Snake, but these have all been occupied for many years, leaving but little chance for new comers to that region, whether their object be cattle raising or farming. In regard to the climate, the summers here are warm and the winters cold, much as everywhere else in the Great Basin, the general level of the country having an altitude of about 5,000 feet.

The first discovery of gold on Snake river was made in the fall of 1869, when the few adventurers who had happened to drift into that region proceeded to lay claim to every thing in sight. Not much work was done that year, but the news of discovery spreading abroad, a considerable emigration set that way early the following spring, the number of miners on the river numbering nearly 1,000 by the first of June of that year. By the time the most of them got in, the water was too high to admit of their doing much, and, as everything was claimed and held at high prices, the majority of them left; being discouraged at the prospect of having to wait so long for the river to fall; few of them, moreover, having the means or being disposed to buy claims at the exorbitant prices set upon them. Where any were sold they brought from $50 to $500 each, some credit being, in most cases, given.

Before the high stage of water the miners here had made from six to ten dollars per day working with rockers, which was about the rate averaged throughout the year. In September some began washing with sluices, at which rather more was made. The section of the river along which these diggings were found, commenced near Salmon Falls and extended 50 or 60 miles up.

By the spring of 1871, the cream had been so far skimmed from the richer bars that the claim holders, generally a thriftless set, began to feel like disposing of their interests in them. But the white population having mostly left it was not now so easy to find purchasers. In this emergency these properties were offered to the Chinese, who had up till that time been excluded from the diggings. With the exception of a few rich claims, everything along the river fell that year into the hands of these people, who proceeded to work out the bars here in their quiet and patient way, making what to them were satisfactory wages.

Having lost all interest to the public, nothing more was heard of these Snake River placers from this time on till the past summer, when public attention began to be turned once more towards this long neglected and nearly forgotten region. Now, great difficulty had from the first been experienced in saving the gold found on these Snake River bars, because of its exceeding fineness, scarcely any of the particles being larger than the grains of ordinary black sand, from which size they diminish to microscopic fineness. Washing with the gold-saving appliances before in use, a large percentage of the gold actually contained in the gravel here was lost, a result that had much to do with causing the early abandonment of these diggings by the whites.

Last year parties experimenting with this material introduced silver-coated copper plates into their sluices, which proved so effectual in saving the fine gold, that they were able to make good wages where scarcely anything could be made washing in the old way. This fact becoming known, soon induced others to have recourse to the same method, and being found to work so well, had the effect to awaken a general interest in these mines. In the meantime new placers had been discovered higher up the river, as well as additional deposits on the bars and along its banks further down, whereby the field of practical operations has undergone great enlargement. It is even said that the diggings at some point along the stream are not confined to its channel or immediate banks, but extend back some distance into the plains adjacent. The dust is, however, everywhere extremely fine, being what is known as float or flour gold, and capable, therefore, of being saved only by the appliance above mentioned.

Now, while these placers would appear to be tolerably extensive and capable of yielding fair wages to parties who may succeed in securing good ground and have the means for outfitting and introducing water upon it, it should be borne in mind by those who may think of emigrating to that region, that it requires a considerable amount of money to effect the above objects. There is no water to be had here for washing, except that taken from Snake river. The bars and ground to be operated upon lie at a considerable elevation above the stream, necessitating the construction of ditches often several miles long, a work that in this country can be accomplished only at a considerable expense. In other words, this preliminary outlay will vary from one to three or four thousand dollars, according to the length of the ditches to be built and the magnitude on which operations are to be carried on. Men who go there without that amount of money at command, will stand but a poor chance of being able to work ground on their own account, and will almost, necessarily, have to work on hire for others. As there will be no great demand for labor in diggings of this kind, wages will not be high, while the cost of living will be considerable. In 1870, the wages paid hired men on Snake river, varied from $3 to $4 per day, they finding themselves. These will probably be about the rates that will obtain in these diggings the coming summer.

Travel to and from that country will be found a costly item. From the west it is reached over the Central Pacific railroad, the point where the traveler leaves the railroad, depending upon what portion of the diggings he wishes to go to. If destined for any point much below the crossing of the Kelton and Boisee road, he will leave at Humboldt Wells, whence there is a fair wagon road and a good pack trail to the river. As there is, however, no public conveyance across this route, parties taking it will have to procure riding and pack animals at the Wells, where they can generally be obtained at moderate prices. Parties destined for any point on the river not far below, or within sixty or eighty miles above this crossing, will leave the railroad at Kelton, whence there is a good wagon road and daily stage to the river. From this place there is also a good wagon road to Fort Hall, situated on the river, over one hundred miles above the Boisee crossing, this being the old emigrant trail. At Kelton it is not easy to get either riding or pack animals for prosecuting this part of the journey. Those desirous of going to any point on the river above Fort Hall—and this we take it will be the case with the majority—will go on to Corrinne, and there leaving the Central Pacific, take the Utah Northern railroad, now completed to Snake river.

The distance from the Central Pacific road to the Snake varies from one hundred and twenty to one hundred and fifty miles, according to the point to be reached. This part of the journey, unless made over the Utah Northern narrow-gauge road, cannot be accomplished with much expedition or comfort, as it lies over a dry and sterile country, tolerably level and well supplied with bunch grass, but badly off for both wood and water. The man who leaves California or Nevada for the Snake River country, depending upon getting employment there, should have, at least, a couple of hundred dollars to start with, the one to take him out, and the other to bring him back, in case he wants to come. Without observing this precaution, there is danger that the scenes of 1870 will find repetition this summer. From June to October of that year, scores of men were to be seen making their way back from Snake river on foot, the most of them sleeping in haystacks, and begging their meals along the road. Adventurers who go out there with the purpose of getting hold of a mining claim, and putting the same in shape for successful working must, as before stated, have a considerable amount of means, or they will very likely come short of their aim, if they are not wholly disappointed.

While the published accounts from that region are mostly encouraging, some of them extremely flattering, it should be remembered how generally such has been the case in regard to this class of discoveries; there being almost always, between claim holders, merchants, stage men and other common carriers, so many interested in exaggerating their importance, and thereby exciting a premature and unhealthful emigration. Then, too, by this time, the best and most available ground is already taken up, and if for sale, held at high prices; leaving those who go in now little chance to get hold of anything valuable by location. For nearly a year past, that country has been full of claim hunters, who, if they have not managed to secure everything worth taking up, have proved false to the traditions of their class, more especially of the average Snake River prospector.

Chinese Immigration.

The leading event in men's minds during the week has been the passage by the Senate of the House bill restricting Chinese immigration. This measure seems to represent the views of a great majority of the people as expressed by the Constitutional Convention and the public prints. The bill now goes back to the House for concurrence in the Senate amendments and then to the President for his signature or veto, as the event shall prove.

The following is the full text of the bill as it passed the Senate.

Be it enacted, etc., That no master of any vessel owned in whole or in part by a citizen of the United States, or by a citizen of any foreign country, shall take on board each vessel at any port or place within the Chinese Empire, or at any other foreign port or place whatever, any number exceeding 15 Chinese passengers, whether male or female, with the intent to bring such passengers to the United States, and leave such port or place and bring such passengers to any number exceeding 15 on one voyage within the jurisdiction to the United States.

Sec. 2. That whenever the master or other person in charge of any vessel takes on board the same at any foreign port or place any greater number of Chinese passengers than is prescribed in the first section of this act, with intent to bring such passengers to the United States, and leave such port or place, and bring such passengers to any number exceeding 15 on one voyage, within the jurisdiction of the United States, he shall be deemed guilty of a misdemeanor, and shall, for each passenger so taken on board and brought within the jurisdiction of the United States, exceeding the number of 15, be fined $100, and may also be imprisoned for not exceeding six months.

Sec. 3. That the master of any vessel arriving in the United States, or of any of the Territories thereof, from any foreign place whatever, at the same time that he delivers a manifest of the cargo, and if thereby no cargo, then at the time of making report or entry of the vessel, pursuant to law, shall, in addition to the other matters required to be reported by law, deliver and report to the Collector of the district in which such vessel shall arrive, a separate list of all Chinese passengers taken on board the vessel at any foreign port or place, and of all such passengers on board the vessel at that time. Such list shall be sworn to by the master in the same manner as directed by law in relation to the manifest of cargo, and refusal or neglect of the master to comply with the provisions of this section shall receive the same penalties, disabilities and forfeitures as are provided for a refusal or neglect to report and deliver a manifest of the cargo.

Sec. 4. That the amount of the several penalties imposed by the foregoing provisions shall be liened on the vessels violating those provisions, and such vessels shall be libelled therefor in any Circuit or District Court of the United States, where such vessel shall arrive.

Sec. 5. That nothing herein contained shall be held to repeal or modify any law forbidding the importation of coolies, or of females for immoral purposes, into the United States; provided, that no Consul or commercial agent of the United States, residing in any port from which any vessel taking Chinese passengers may take her departure, shall grant the certificate provided for in section 2,162 of the Revised Statutes for more than 15 Chinese passengers on any one vessel.

Sec. 6. That this act shall not apply to persons officially connected with the Chinese government, or any Embassy thereof, or to persons rescued from shipwreck during the voyage of and by the vessel seeking a harbor in stress of weather within the jurisdiction of the United States, or to persons who may only seek a temporary residence for educational purposes, and who shall have a certificate from the Chinese government for that purpose.

Sec. 7. That this act shall take effect from and after the first day of July, 1879, and the President of the United States shall immediately on the approval of this act give notice to the government of China of the abrogation of articles five and six of the additional articles of the treaty of June 18, 1868, between the United States and China, proclaimed February 5, 1870, commonly called the Burlingame Treaty.

Fuel Saving.

Talk to ninety-nine out of every hundred coal men about economy of combustible and it does not interest them, because they expect a learned treatise, or else a project to save a hundred dollars' worth of coal a year by putting up a two thousand dollar apparatus. This article is intended for the ninety-nine.

In order that combustion may be perfect, it is necessary that the fuel and the burning medium be intimately mixed; which cannot well take place unless the two are in the same physical nature. They must be put in contact at the temperature necessary to perfect combination; their contact must be somewhat prolonged to ensure this elevation of temperature, intimate mixture and perfect burning. The proportions of fuel and combusant (which is the best word we can find for the burning medium) should be exactly that which is necessary to the desired result of combustion.

We will talk first about a free-burning coal, having a composition by weight of

Pure carbon	65 kilos
Ash	5 "
Water (absorbed)	5 "
Tar	5 "
* Lighting gas	20 "
Total	100 kilos

* Making 27 cubic meters at 0° C.

The 20 kilos of gas have about the following composition.

	Kilos.	Cubic Meters.
H—Hydrogen	0.24	2.67997
C2 H4	14.16	19.81414
C4 H4	1.60	1.26475
CO	2.60	2.07858
NH3	0.50	0.64882
HS	0.20	0.12985
CO2	0.70	0.35407
Totals	20.00	20.97018

In this coal we may have the following combustible elements (counting tar as C4 H also):

Pure carbon	65 kilos
Tar C4 H4	5 "
Hydrogen (H)	0.24 "
C4 H4	1.60 "
C2 H4	14.16 "
Carbonic oxide (CO)	2.60 "
Sulphureted hydrogen (HS)	0.20 "
Total	88.80 kilos

Suppose that we could burn these elements perfectly, we could get, according to Favre and Silbermann, 803,779.6 calories for the 100 kilos. If we could utilize this heat perfectly we should be able, according to Regnault, to produce for each kilo of coal 12.618 kilos of dry steam at 1 atmosphere, or 12.041 at 15 atmospheres. It is very evident that we do not get these results in practice, as we are content to range up to 5 kilos, and seldom run over 4.

In about all the boilers now used we employ a naked fuel-bed and natural draft.

Thanks to these two we manage to lose nearly as much of the heat as is possible. In general, combustion in a grate with natural draft is not chemically good. The fuel and the combusant are not in the same physical condition—one is a solid and the other a gas, and they get mixed they best way they can—which is not saying very much. Then very often there is as high as 30% or 40% of water carried over in the steam. But it is to the ordinary chimney that we owe most of our loss. If we take an ordinary boiler setting we find the following causes of loss of heat: 1st, excess of air owing to the use of a grate; 2d, the employment of a chimney; 3d, lack of a smoke consumer; 4th, cinders of unconsumed coal; 5th, badly built boilers; 6th, radiation from the fire-box and walls.

Grouping by species the combustible elements in our 100 kilos of sample coal, we find:

Carbon	82.39143 kilos
Hydrogen	4.73462 "
Sulphur	0.18824 "
Total	87.31429 kilos

These need, to burn them thoroughly into CO^2, HO and SO^2, 257.77568 kilos of oxygen. There is 1.48571 kilos of this oxygen in the illuminating gas; so have 256.28997 kilos of oxygen required to be brought in from outside, as part of the air; and to furnish this requires 1114.30422 kilos of air. As a temperature of 0°C and with barometer at 760 mm this would occupy 861.797 cubic meters.

Now, with a grate and a natural draft it is not possible to admit just this quantity of air. The grate is an obstruction—the air does not circulate freely in the fuel bed; and hence we endeavor to increase the grate areas and quicken the draft. We generally allow space enough for double the requisite quantity of air. The gases enter the base of the chimney at temperatures, running up as high as 500° C. (=932° F.) in the case of metallurgical furnaces—not so high in the case of ordinary boilers, suppose we say 370° C. =572° F.

The caloricity of air is, according to Regnault, in weight, 0.22727 at zero. Applying this to our case, and supposing that we introduce an excess of 1114.30422 kilos, and that it escapes at 500° C., the loss of heat will be 132.195 calories, or 16%. In puddling furnaces and express locomotives it often passes this on account of the sudden introduction of great currents of cold air.

The loss from chimney draft alone is 25% of the heat furnished by the combustion of the coal. Even supposing that the combustion was complete and without excess of air, the calculation applied to the foregoing figures gives for the gases burned the following composition:

Nitrogen of the air of combustion	858.01425
Carbonic acid of combustion	302.10091
" " of the lighting gas	0.70000
Water of combustion	42.01158
Hygroscopic water	5.00000
Ammonia of the lighting gas	0.50000
Sulphurous acid, SO^2, of combustion	0.37648
Total	1209.30422

The calorific equivalent of these gases counts up to 288.25532, and supposing them to escape at 500° C., the total heat carried off by them amounts to 144.12766 calories, or 18%, even supposing an exactly perfect combustion.

The loss in smoke is considerable. The coal and air cannot be intimately mixed, and hence combustion is not perfect. The "smoke" may be *colorless* and yet contain considerable quantities of combustible gases—that which blackens smoke is merely impalpable carbon mechanically carried over. Dehette states the loss from smoke as 9% at least, and analyses have shown sometimes as high as 24%. Experiments at Mulhouse give 15%; Ebelmen found 7%; Siemens found 40%. We might say 20% without very far overshooting the mark.

The loss from cinders, that is, unburned coal, varies. In the case of locomotives—where they are not recovered—it is very considerable. In metallurgical furnaces it is also large—frequent stirring causes the particles to free—and in burning below they cause great discomfort to the puddler. In experiments at Cherbourg, Tresca and Silbermann found 25% of cinders; but we are hardly justified in saying that the loss here will run over 15%.

In calculating the heating power of our coal, we have adopted for the calorific power of hydrogen 34,462; but this is the heat given out in burning hydrogen into water. Now this water has to be vaporized at an expense of heat equal to at least 29,102 calories, (48 kilos × 606.5, which is the latent heat of vaporization of water). These 29,102 calories represent 3.6% loss.

We have still another loss, that due to radiation, melting of ashes, etc.; but we will not count this now. We have already found the following percentages of loss:

1. Excess of air	16 %
2. Chimney	18 %
3. Smoke	20 %
4. Cinders	15 %
5. Vaporizing 48 kilos of water	3.6%
6. Radiation, etc.	(?)
Total	72.6%

We may say then 73% of loss by the use of a grate and natural draft. To obviate this, we find that there are employed: 1. Rocking grates. 2. The introduction of hot or cold air at various points. 3. Smoke-consuming fireplaces with steam jets over the flame, on the coal, or in the chimney. 4. "Gas furnaces."

The first series are in many cases excellent, but are complicated. The second have given good results in some cases; but many of them cause the introduction of *too much air*, and only exaggerate the first loss. The third gets a little nearer the bottom of the question. They aid the mixture of the gaseous matters; but the steam injected absorbs heat by its partial decomposition, increases the loss through the chimney, and costs too much. One smoke consumer (Thierey's) saves 10%, but it costs in live steam, enough coal to count up to 8%, leaving an economy of only 2%.

Of gas furnaces, the best known is that of Siemens. The generator is not "blown," the heat produced by the oxidation of the carbon is lost, and the gases produced lose their heat before coming to the regenerator. The heat set free by the first transformation of the carbon is 160,745 calories, or about 20% loss. There is a certain quantity of tar deposited in the passages. Supposing that its sale pays for taking it out, we have a loss of heat of $11,588 \times 5 = 59,290$ calories, or 7.4%. The radiation from the furnace is not saved, and it is very considerable in this system. Krans states it at 27,750 calories, which is in our case, 3.5%.

Being of natural draft, the thickness of combustible is limited. With a forced combustion, the thickness of the bed could be increased and the carbon completely oxidized. The first draft causes a loss of heat equal to 20%. The gases escape from the chimney at 200° C. (392° F.) and higher, and we might place the loss from the second draft at 10%. The loss from incomplete combustion is lessened and may be stated at 5% instead of 10%. The vaporizing of the 48 kilos of water takes place here, of course, with its attendant loss. We might then consider the useful effect of the gas furnace diminished by the following losses:

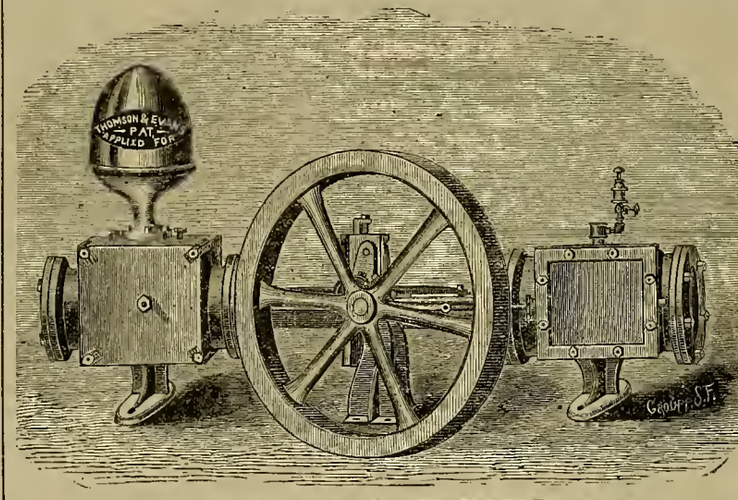
Oxidizing the carbon	20.0%
Waste of tar	7.4 %
Second draft	10.0 %
Smoke	5.0 %
Radiation	3.5 %
Vaporizing 48 kilos of water	3.6%
Total	49.5

Or nearly one-half. As the ordinary systems waste 73.5, we have its saving over the other 24% of what the coal ought to do, and its useful effect $24 \div 26.5 = 90.56\%$. We can, however, see a wide field for inventive genius.

Thomson & Evans Pump.

We saw this week at the machine shop of Thomson & Evans, 112 Beale street, a new water cylinder for the large steam pump of the Empire coal mine, at Mount Diablo. The water cylinder is 7⅜ inches in diameter and 3 feet stroke, and the steam cylinder 18-inch diameter. This pump is intended to lift the water 600 feet at one lift.

The water cylinder end of the pump is somewhat peculiar in the arrangement of the valves. The valve plates are separate from the chests, and made to fit in between the suction pipe and valve chests so that the whole plate may be removed by taking out a few bolts. It is then only a few minutes work to remove the plates and put in new ones when they wear. Hand holes are also made in the chests through which any of the valves may be taken out separately.



THOMSON & EVANS CRANK AND FLY-WHEEL PUMP.

The valve slides on a spindle which screws into the spider, there being a spring on the spindle, back of the valve. The outer ends of the spindles have a handle by which they may be unscrewed when the valves need facing up or new washers. Separate valves are kept on hand and may be put in in a few minutes and the old ones removed. This construction has been found necessary, as the water in the mine is very bad and eats out the valves and plates very quickly. These pumps were made with the object in view of being able to quickly change the valves and plates, as it is so frequently necessary.

They manufacture at this shop, a style of crank and fly wheel pump of the type illustrated on this page, which has become a favorite for boiler feed for steamboats, etc. The yoke is solid, the piston rod for both chambers being in one piece. Usually the yoke is open and the rod in two pieces so that a certain amount of play is allowed after the pump is used a short time. With this, however, the yoke is solid and the pump always runs true without any chance of getting out of order. The valves are so arranged as to be easily accessible for repair. Mr. Watson, chief engineer of the California Sugar Refinery, is running one of these pumps 1,800 feet from the well from which the supply is drawn, and it pumps 100,000 gallons of water a day, to a hight of 60 feet. He says, as regards economy and durability, it is superior to any direct-acting pump. This one has a 10-inch steam and 5-inch water cylinder, with 18-inches stroke. A number of these pumps are used on steamers on the bay. On the tugs they put a pinion on the shaft and gear wheel on the gipsy, and by means of the pump haul in hawsers and light loads on the gipsy. They are also used for wrecking pumps, etc.

A COMMITTEE of the Illinois Legislature has decided to report that the rates of the Pullman Car Company are not exorbitant, as the dividends are only 8%.

THE rainfall so far this season is 11.40 inches.

The Dead Mining Towns and What They Teach.

John Muir, the mountain climber and pleasant writer upon what may be seen at these high altitudes, has, in the *Bulletin* of recent date, a characteristic letter wherein he describes the dead towns and mining camps met with in his peregrinations through the State of Nevada. The defunct are many and melancholy to behold, as being the woful evidences of a vast amount of energy misapplied and capital misspent. And it would be well if these monuments of waste and folly were confined to Nevada, which they are not. We find them throughout the entire mining region of the Pacific coast. They exist in Utah and Colorado; in Idaho and Montana; in Arizona, the youngest, and in California, the oldest of our mining countries; though it is but fair to say, that fewer of them are to be found in this State than anywhere else. We have here, to be sure, many of these nearly deserted and much dilapidated towns; places that were once populous, prosperous and musical with the hum of business. But as a general thing they were not, like the towns of which the mountain climber speaks, premature and uncalled for—brought into existence through a forced and unnatural growth. They were built for the accomodation of the business pertaining to and of the miners employed in the diggings about them. When these latter were exhausted, the miners left, business ceased, and these towns went to decay. But they had subserved the end for which they were built, and when they perished, no one was disappointed, and no one specially suffered. The exceptions to this rule here in California, are found in the towns of Meadow Lake, Silver Mountain, Panamint and a few other less signal instances.

In Nevada, John Muir might have added a good many notable examples to the number of the "late deceased," mentioned in his letter to the *Bulletin*. The empty towns and the well filled graveyards are not confined (and he intimates as much) to the Toiyaba range, the Schellburn canyon and the localities about Treasure Hill. They stand on the hill slopes, sit in the deserts and look out from the mouths of the dark ravines everywhere over that whole country. They abound in fact, as we said before, in all the States and Territories west of and adjacent to the Rocky mountains. Even in the gloomy woods of Washington and British Columbia we encounter them. Whatcom, deserted almost as soon as it was built, sits a ruin on the beautiful waters of Puget sound. Port Douglas, once the hopeful entrepot for the Upper Frasier river country, is now almost without an inhabitant, while Hope, Yale and Langly, at one time places of considerable size and very great expectations, are reduced to almost the same condition. Arizona, as a mining country, being so comparatively young, it might be thought would lack these examples of superannuation in youth; yet she has them too. La Paz is not; Gila City has outlived its usefulness, and Lyonsville has been extinguished, to say nothing of the Aztec remains that relate to the doings of another race and an earlier day. They are, indeed, everywhere all too numerous, these evidences of mistaken enterprise and capital wasted—these monuments of illusive hopes, vain plantings and unrequited toil.

But sad and numerous as they are, these ruins scattered over the great interior wilderness, they represent but one aspect of the case. There are other ruins behind these even more deplorable, and of which they are only the outward exponent. There is the financial ruin that so much wasted means and profitless expenditure have lead to. There is the ruined credit of the merchant, the farmer, and the manufacturer; the ruined hoard of the laboring man; the ruined deposit at the safety bank; and the general ruin worked to the gatherings of all classes of the community, for all have been made to contribute of their means towards this great outlay.

Without censuring the men who were chiefly instrumental in causing so great a misapplication of money, it having been in large measure the result of an ignorant over-zeal, it would not be out of place to remind these parties when they upbraid the community, as they often do for their backwardness in contributing towards the development of the mines, how very liberal these contributions have already been, and to what poor purpose they have sometimes been expended. Let the prospector, claim holder, and the promotors of mining schemes in general, remember how badly investors in this class of enterprises have heretofore fared, and seek to diminish the chances of their loosing when applying to them for money aid in future.

On the other hand it should be recollected that while so many of these early projects came to grief, it does not follow that the mines which they were designed to open up were worthless or otherwise in fault. Many of the districts that, under the first repulse, were abandoned, have since, under a wiser application of means and through better directed and more persistent efforts, show themselves to be rich in mineral wealth, some of them being now among the most productive on the coast. The mistakes that lead to their abandonment resulted mostly from want of experience. They were incidental to the times and scarcely avoidable. With our changed conditions, they should no longer occur, or if they do, should not be so readily condoned as in times gone by.

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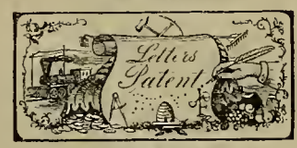

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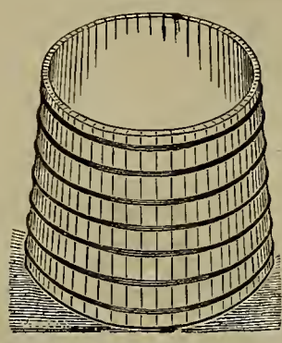

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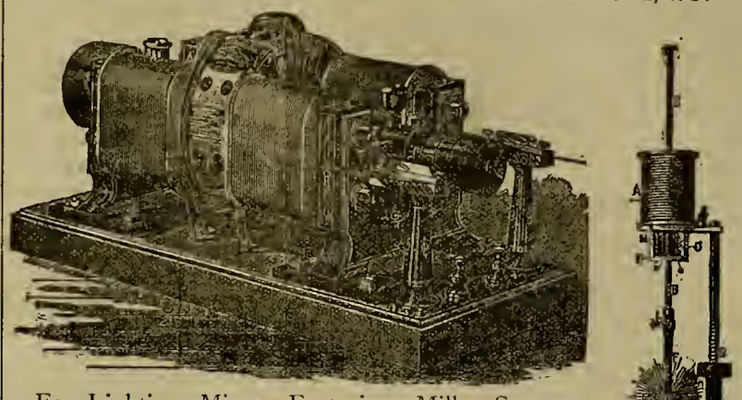

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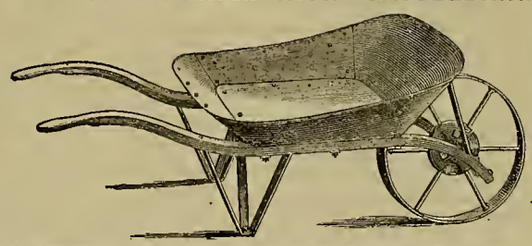

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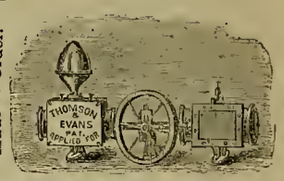

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Continued from Page 117.

ent crosscuts are without any material change. We have put in 12 new sets of timbers in south compartment of the hoisting shaft. The timbers are in a very rotten state and will have to be replaced for at least 150 feet.

EUREKA DISTRICT.

JOTTINGS.—*Sentinel*, Feb. 15: It is reported that a rich and extensive strike has been made in the Jackson mine. The Eberhardt & Aurora mine is now being worked on tribute by Messrs. Green, Suider and others, and is looking well. The ore is of a very high grade, but the casing of the ledge is so hard that it is almost impossible to break it in any great quantities. Mr. Robertson, of the Baldy Sour mine, has let a contract to run 80 feet of a drift from the bottom of the shaft, which has heen taken by Messrs. Whealan & Kenney. The Stafford company are prospecting their mine, and are opening a fine body of ore. Tim Shine has a streak of ore from two to three inches thick, John Dick is prospecting his mine, working three men.

ELY DISTRICT.

RAYMOND & ELY.—Pioche *Record*, Feb. 8: There has been hut very little work done on the 1300 level; the ledge has not been crosscut, but shows very well where it has heen broken into. The 1400 level has two crosscuts only about 25 feet apart; the ledge seems to be broken up a little at this point from the influence of a cross-course that runs through at this point. The winze is now down 50 feet below the 1400 level, in good sinking ground, and all heavily charged with mineral. The raise from the 1200 level is showing finely; four feet drill hole put in shows assays of $120 per ton. Mine and mill running finely; mine producing about 200 tons of ore per month, assay value, $200 per ton.

REESE RIVER DISTRICT.

MANHATTAN ITEMS.—*Reveille*, Feb. 15: During the past 10 days there was reduced 162 tons, the assay value of which is $33,002.13, of this amount $13,861.29 was from custom ores and $19,140.84 from the Frost and Curtis shafts. The battery since the 10th instant has been run 12 hours per day. The 517 west drift, of the Curtis shaft, contains some good ore in places; a crosscut has heen started in the foot wall to prospect the 560. The 560 stope continues to produce about the same quality of ore from the several different strata that are being worked. The drifts being run east and west from the 600 west crosscut both contain good ore, that on the east side being much the best. A chute is being raised from this level to connect with the 560 level. The 825 stope is opening out very well and considerable good ore could be extracted were the level well ventilated. The ore at the 770 and 870 levels, of the Frost shaft, does not afford any margin when worked on day pay; and the entire mine is now worked on trihute. They are now opening out on a body of ore below the 600 west drift of the North Star shaft on the Allsopp ledge.

Agricultural Works.

This week we had the pleasure of being shown through the new agricultural works and foundry of Byron Jackson, on the corner of 6th and Bluxome streets, in this city. Mr. Jackson, whose new and valuable improvements in agricultural machinery have received frequent mention in our previous issues, first opened a machine manufacturing business at Woodland, in 1872. The works there were smaller than those now occupied, and were intended chiefly to produce the new inventions in separators, forks, etc., of which he holds the patents. His improved machinery met with immediate approval, became popular, and his business rapidly enlarged. One invention leads to another, and each improvement requires new and special machinery. This, together with the isolated position of Woodland as regards shipping facilities, the profit to be made by purchasing raw material in the city, together with the desire to be nearer to his customers, about a month ago led to the transfer of the works to their present situation.

The building is 112x125 on the ground plan, and is two stories high. The first thing that strikes the eye on entering, is the brightness and neat arrangement of the interior. The great number of windows allows an abundance of light to enter, a thing not commonly found in such places. The engine is situated in the center of the building, and the gearings and connections are so arranged, that the running of any one part of the machinery can be accomplished without necessarily keeping the other parts in motion. This of course makes a great saving in the expenditure of power, and also in the wear and tear on the machinery.

The Jackson "Feeder and Elevator" has already received notice in these columns, and is withal, too well known to need description here. We will only say that it possesses the two great virtues of simplicity and durability. It, together with the "Jackson Light-Weight Horse Fork," are made specialties by the house, though all sorts of light agricultural machinery are manufactured to order. The horse-fork above mentioned attracts the eye at once, and especially of those accustomed to the heavy clumsy forks now in use. It is only half their weight, yet is equally strong and durable. It is constructed of a light frame, the head being formed of two pieces, one on each side through which the tines pass, the tines, together with a light iron brace from each tine to the frame, lock the parts firmly between them. The strain is brought to bear straight with the grain of the wood, avoiding all twisting motion. The whole weighs about 35 pounds.

The works are not running in full blast, a large part of the machinery having yet to be placed in position. The common force of hands when all is in running order is 30. At present no new separators are manufactured, but simply old ones modified and supplied with the new patent feeders, elevators, shoes, etc. As soon as the present works are fully in running order, Mr. Jackson expects to commence making entirely new machines of his own patent, his facilities for so doing covering every part of the operation from the woodshop to the foundry.

News in Brief.

THE Egyptian army is to be reduced to 10,000 men.

AN alliance of Eastern trunk lines is strongly rumored.

A GREAT deal of stock is faring badly in southern Oregon.

THERE is a deficit in Hungarian finances of 24,000,000 florins.

TYPHUS fever is raging in Paris, especially among the soldiers.

CONGRESS is voting away money by appropriations, in millions.

THE Roman Papacy is bankrupt and cannot pay its hishops.

A FREE trade coalition is being formed by the German Reichstag.

FIVE HUNDRED fresh communists are to be pardoned in France.

THE continued drouth is liable to cause another famine in India.

A FARMER near Cuffey's Cove has begun the culture of flax.

ARIZONA has come to the front as the loosest divorce State in the Union.

THREE HUNDRED AND FIFTY Chinamen were shipped homeward this week.

THE Congressional Deficiency Appropriation bill aggregates $2,500,000.

A SEVERE shock of earthquake was felt at Hollister, on the 13th inst.

GAME has become scarce in Oregon, through its indiscriminate slaughter.

A WHALING station is to be established at Little River, Mendocino county.

THE Indians are rising in Alaska and massacreing the white inhabitants.

THE remains of the late Bayard Taylor will shortly arrive in New York.

Two men were blown to atoms by a premature blast explosion in Virginia City.

THE Chinese Emperor has 100,000 subjects in California capable of hearing arms.

HOT water has been turned into the Sutro tunnel and the working force discharged.

LARGE numbers of cattle are starving to death in Nebraska, the feed being covered hy snow.

A SEVERE snow storm is raging on the upper Columbia, and the river is closed by the ice.

DALLAS, Texas, talks of following the example of Memphis, and throwing up her municipal charter.

THE Czar has issued a manifesto declaring definite peace with Turkey, and the troops have been ordered home.

MACHINERY HALL, Centennial grounds, Philadelphia, originally costing $800,000, was sold at auction recently for $24,000.

STATISTICS show that the number of cigars annually consumed in the United States is 40 for each man, woman and child, in addition to two pounds of tobacco each.

AN Oregon Chinese cook put strychnine in the coffee he had made for breakfast; was detected by the men, forced to drink a large quantity of it and died from the effects.

EVERY new subscriber who does not receive the paper and every old subscriber not credited on the label within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect us and subscribers against the acts and mistakes of others.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

ARTESIAN WELLS WANTED.—Parties who are prepared to contract for boring artesian wells are invited to send terms to Edward Frisbie, proprietor of the Reading Ranch, Anderson, Shasta County, Cal.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

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ATTACHMENTS FOR BOTTLE FASTENINGS—S. Martinelli, Watsonville, Cal.
WHEELS FOR TRACTION ENGINES—J. Kirchboffer, Walla Walla, Washington Ter.
WHIFFLETREE HOOKS—A. Smith, Fort Randall, Dakota Ter.

——The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

FIRE INSURANCE.—We publish the official annual statement of the Fireman's Fund Insurance Co., in our advertising columns this week. The attention of the uninsured (and of those who wish to increase or change their policies), is confidently called to this association and its sworn statement. We have long patronized this home company, and consider it one of the safest doing business in the United States.

GENERAL MERCHANDISE.

[WHOLESALE.]
WEDNESDAY M., February 19, 1879.

BAGS—Jobbing.	
Eng Standard Wheat.	9 @ 9½
Neville & Co.	
Hand Sewed, 22x36..	9 @ 9½
24x36	—@—
23x40	11 @—
Machine Swd, 22x36.	9 @ 9½
Flour Sacks, halves	8½@10
Quarters	5¼@ 6½
Eighths	3¾@ 4
Hessian, 60 inch	13 @14
45 inch	8½@ 9
40 inch	7½@ 8
Wool Sacks,	
Hand Sewed, 3½ lb..	46 @50
4 lb do	50 @52½
Machine Sewed	45 @—
Standard Gunnies	13½@14
Bean Bags	7 @ 7½
CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits,	
2½ lb cans	2 00 @ —
Table do	3 00 @ —
Jams and Jellies	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef,	
2 lb, doz	4 00 @ —
do Beef, 4 lb, doz	6 50 @ —
Preserved Mutton,	
2 lb, doz	4 00 @ —
Beef Tongue	6 50 @ —
Preserved Ham,	
2 lb, doz	6 60 @ —
Deviled Ham, 1 lb,	
doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —
COAL—Jobbing.	
Australian, ton	8 00 @— —
Coos Bay	6 50 @ 7 00
Bellingham Bay	6 50 @— —
Seattle	6 00 @ 6 50
Cumberland	14 00 @— —
Mt Diablo	4 75 @ 6 00
Lehigh	13 50 @— —
Liverpool	7 50 @ 8 00
West Hartley	10 50 @— —
Scotch	10 50 @— —
Scranton	11 50 @— —
Vancouver Id	7 00 @— —
Charcoal, sack	75 @— —
Coke, bbl	60 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	4½@ 5½
do in cases	5 @ 6
Eastern Cod	— — @— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Lime, Sta Cruz,	
bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @— —

Plaster, Golden	
Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
NAILS.	
Ass'ted sizes, keg	2 90 @ 3 00
OILS.	
Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @ —
do, No. 2	1 05 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	72 @ —
Boiled	75 @ —
Cocoanut	55 @ —
China nut, cs	70 @ 72½
Sperm	1 40 @ -
Coast Whales	40 @ —
Polar	45 @ —
Lard	90 @1 00
Oleophine	22 @ 22½
Devoe's Bril't	22 @ 23½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	37½@ —
Elaine	37½@ —
PAINTS.	
Pure White Lead.	8 @ 8½
Whiting	1¾@
Putty	4 @ 6
Chalk	1½@ —
Paris White	2½@ —
Ochre	3¼@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 60
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	5 @ 5½
Hawaiian	7 @ 7½
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	10 @ 10½
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal.,	
½ lb glass	1 50 @ —
SUGAR, ETC.	
Cal. Cube, lb	11½@ —
Powdered	11¾@ —
Fine crushed	11½@ —
Granulated	11 @ —
Golden C	9½@ —
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Foo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending February 18, 1879.

	Feb 12	Feb 13	Feb 14	Feb 15	Feb 16	Feb 17	Feb 18
HIGHEST AND LOWEST BAROMETER.							
	30.217	30.361	30.420	30.280	30.187	30.233	30.387
	30.084	30.217	30.288	30.060	30.148	30.133	30.240
MAXIMUM AND MINIMUM THERMOMETER.							
	61	59	59	68.5	58.6	58.5	68.7
	57	52.5	50	60	48	52	61
MEAN DAILY HUMIDITY.							
	85.7	92	83	87.3	73.7	90.7	87.3
PREVAILING WIND.							
	SW	S	W	SW	NE	W	W
WIND—MILES TRAVELED.							
	29.9	89	92	134	185	164	149
STATE OF WEATHER.							
	Rainy	Cloudy	Fair.	Rainy	Fair.	Rainy	Fair.
RAINFALL IN TWENTY-FOUR HOURS.							
	.98	.04		.51	.04	.66	.02

Total rain during the season, from July 1, 1878, 11.40 in.

METALS.

[WHOLESALE.
WEDNESDAY M., February 19, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, February 19, 3 P. M.

SILVER, 2¼@2¾. GOLD in New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@20 ℘ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49¼@49½. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 87¾@89.
LONDON Consols, 96 5-16; Bonds, 104 3-7.
QUICKSILVER in S. F., by the flask, ℘ lb. 40@41c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Griffith Consolidated Mill and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

Notice is hereby given, that at a meeting of the Board of Trustees, held on the 21st day of January, 1879, an assessment (No. 1) of twenty cents (20c) per share was levied upon the Capital Stock of the Corporation, payable immediately to the Secretary, at the Office of the Company, Room 48, 330 Pine Street, San Francisco, California.

Any Stock upon which this Assessment shall remain unpaid on the 26th day of February, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, March 26th, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Trustees. GEO. M. CONDEE, Sec'y.
Office, Room 48, 330 Pine Street, San Francisco, California.

Office Wide Awake Prospecting and Mining Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

Summit Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fourth day of February, A. D., 1879, an assessment (No. 7) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the eleventh (11th) day of March, A. D., 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Tuesday, the eighth day of April, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.
R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine Street San Francisco, Cal.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE .... Manager.
F. LYSTER .... Acting Manager.
CHAS. H. GOODWIN .... Treasurer.
J. P. CHAPMAN .... Assistant Treasurer.

Primrose, West, Barlow and Wilson's MINSTRELS!

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE .... Lessee and Manager

ELIZA WEATHERSBY & N. C. GOODWIN

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR .... Manager.
BARTON HILL .... Acting Manager.

MR. & MRS. W. J. FLORENCE.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

STANDARD THEATER.

M. A. KENNEDY .... Sole Lessee and Manager.

MAD. RENTZ'S FEMALE MINSTRELS.

Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.

GRAND OPERA HOUSE.

THOMAS MAGUIRE .... Manager.
FRED LYSTER .... Acting Manager.

WITHIN AN INCH OF HIS LIFE.

Mission Street, near Third. Box office open daily.

OFFICE OF THE

GIANT POWDER COMPANY,

San Francisco, February 15th, 1879.

To the Mining Public.

The fact that a new Company has just been organized in this city for the avowed purpose of making and vending a Dynamite Powder called Vulcan Powder, which Powder has been for over a year past and is at this moment under injunction from the U. S. Circuit Court at the East and is soon to be proceeded against on this coast, renders it proper and necessary that this Company should make a statement concerning the present position of its patent litigation, to the end that no person should be induced, through the lack of information, to engage in a business which must shortly bring him before the Courts to answer to an infringement suit.

The public is already aware of a recent decision of the United States Supreme Court on appeal in the case of the Giant Powder Company vs. the California Powder Works, and has recently seen various newspaper articles in the interest of infringers upon the Nobel Patents, calculated to create a false impression as to that decision.

The decision in question was simply against the validity of two unimportant Reissues, Nos. 4818–10, both from an old Patent, No. 50,617, issued in 1865, long prior to the Dynamite invention, which latter invention was first patented in the United States by original Patent No. 78,317, issued May 26th, 1868, from which Patent No. 5,790 is a Reissue, and not, as has been falsely stated, a Reissue of the old Patent of 1865.

This Dynamite Patent No. 5,799, consequently has no connection whatever with the old Patent of 1865, nor with its Reissues, and was not in anywise impaired by the above referred to decision of the U. S. Supreme Court; on the contrary, by that decision the case was sent back here for trial, and the defendants were ordered to appear and answer to the suit of this Company under said reissue No. 5,799, which they must do in due time.

The Dynamite Patent (5,799) is the vital Patent of all the Nobel inventions. It is the Patent under which all the late injunctions have issued from the United States Circuit Courts at the East. Under it two injunctions have already been issued there, and are to-day in force against the same Vulcan Powder, made by the same person who is to be the manager of the new Company here. In every case yet decided by the Courts, this Patent has been fully sustained. Under it the following injunctions have been issued:

CIRCUIT COURT OF THE UNITED STATES, DISTRICT OF MASSACHUSETTS.
THE ATLANTIC GIANT POWDER COMPANY vs. GEORGE W. MOWBRAY, ET AL.
Before Shipley, Judge.
Bill in equity for making and selling Mica Powder.
Decree October 5, 1877, for perpetual injunction.

CIRCUIT COURT OF THE UNITED STATES, DISTRICT OF MASSACHUSETTS.
THE ATLANTIC GIANT POWDER COMPANY vs. GEORGE A. GOODYEAR.
Before Shipley, Judge.
Bill in equity for selling Vulcan Powder.
Injunction granted December 21, 1877.

CIRCUIT COURT OF THE UNITED STATES, DISTRICT OF MASSACHUSETTS.
THE ATLANTIC GIANT POWDER COMPANY vs. GEORGE W. TOWNSEND.
Before Shipley, Judge.
Bill in equity for using Vulcan Powder.
Injunction granted December 21, 1877.

CIRCUIT COURT OF THE UNITED STATES, DISTRICT OF NEW JERSEY.
THE ATLANTIC GIANT POWDER COMPANY vs. THE NORTH JERSEY IRON CO., ET AL.
Before Nixon, Judge.
Bill in equity for using Vigorite Powder.
Injunction granted April 30, 1878.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK.
THE ATLANTIC GIANT POWDER COMPANY vs. THE NEPTUNE POWDER COMPANY.
Before Blatchford, Judge.
Bill in equity for making and selling Neptune Powder.
Injunction granted May 20, 1878.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK.
THE ATLANTIC GIANT POWDER COMPANY vs. THE MINER'S POWDER COMPANY.
Before Blatchford, Judge.
Bill in equity for making and selling Vigorite Powder.
Injunction granted May 20, 1878.

CIRCUIT COURT OF THE UNITED STATES, WESTERN DISTRICT OF PENNSYLVANIA.
THE ATLANTIC GIANT POWDER COMPANY vs. VALENTINE LEARY, ET AL.
Before McKennan, Judge.
Bill in equity for using Neptune Powder.
Injunction granted June 10, 1878.

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK.
THE ATLANTIC GIANT POWDER COMPANY vs. ANDREW J. PARKER, ET AL.
Before Blatchford, Judge.
Bill in equity for making and selling various nitro-glycerine powders.
Injunction granted September 13, 1878

CIRCUIT COURT OF THE UNITED STATES, SOUTHERN DISTRICT OF NEW YORK.
THE ATLANTIC GIANT POWDER COMPANY vs. WILLIAM AGAR, ET AL.
Before Blatchford, Judge.
Bill in equity for making and selling Potentia Powder.
Injunction granted September 13, 1878.

In addition to the foregoing several other important cases have just been argued and submitted, decisions upon which will be forthcoming very shortly.

Having placed the foregoing facts before the public, any person who may hereafter engage or become interested in making Nitro-Glycerine Powder in infringement of the Nobel Patents, will do so with his eyes open, and will have no cause of complaint when the Giant Powder Company moves, as it very shortly will do, to establish its rights on this Coast.

It may be well to add that the Giant Powder Company has no intention whatever, upon the complete establishment of those rights, to extort high prices for its Dynamite, but will continue to furnish Powder to the mining public at moderate prices.

The foregoing is published in pursuance of a resolution passed at a special meeting of the Board of Trustees, held this 15th day of February, 1879. By order of the Board.

The Giant Powder Company,
By its Secretary, H. PICHOIR.

FIREMAN'S FUND INSURANCE COMPANY

Of California.

JANUARY 1st, 1879.

Assets.

Cash in Company's Principal Offices	$ 4,000.12
Cash in Bank of California, S. F.	10,583.20
Cash in Bank of Sather & Co., S. F.	6,302.23
Cash in Union National Bank, Chicago	16,103.00
Cash in First National Bank, Ohio	8,000.00
Cash in Laidlaw & Co., New York	256.00
Bonds—U. S. Registered 6's of '81	119,812.50
Bonds—U. S. Consols 1907, 4-per cts	30,000.00
Bonds—Oakland City, Cal.	29,250.00
Bonds—Oakland Gaslight Co., Cal.	17,600.00
Stock—First National Bank, S. F., 133 Shares	11,970.00
Loans on Bond and Mortgage	181,200 00
Bills Receivable, secured by Collaterals	40,870.00
Real Estate, unincumbered	200,000.00
Bills Receivable for Marine and Inland Risks	25,344.20
Premiums in course of collection	51,459.09
Interest and Rents due and accrued	2,818.67
Taxes advanced, secured by Mortgaged Property	2,153 09
Total Assets	$766,221.10

Liabilities.

Losses reported and in process of adjustment—Fire	$20,700.00
Marine	4,546.80
Dividends uncalled for	652.49
Marine bills payable	4,300.45
Agency balances overpaid	120.26
Total	$30,320.00

Re-Insurance Reserve.

Fire	$228,106.35
Marine	32,950.12
Total	$261,056.47

Recapitulation.

Capital stock, fully paid	$300,000.00
Reserve for re-insurance	261,056.47
Reserve for unsettled losses, etc.	30,320.00
Net surplus over all liabilities, including capital stock	174,844 63
Total	$766,221.10

Comparative.

Net assets, January 1, 1878	$700,674.32
Net assets, January 1, 1870	735,901.10
Increase	$35,226.78

Total Losses Paid Since Organization,
$3,630,435.96.

D. J. STAPLES ..... PRESIDENT.
ALPHEUS BULL ..... VICE-PRESIDENT.
GEO. D. DORNIN ..... SECRETARY.
WM. J. DUTTON ..... ASSISTANT SECRETARY.

The "California Legal Record."

The ONLY WEEKLY containing all the decisions of the Supreme Court of California,

(The ONLY COMPLETE continuation of the S. F. *Law Journal*.)

Published every Saturday, in 8 vo. size—like the California Reports—contains EVERY DECISION of the Supreme Court, as fast as rendered, with a syllabus and statement of facts, and other important legal matter. The volumes commence on the first of October and April each, and have a full index for reference and binding.

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No. 603 Washington street, San Francisco, Cal.

Cheerfully Recommended.

CHEROKEE, Sept. 8th, 1878.

DEWEY & Co.—*Gentlemen:*—Having received my Letters Patent for improvement in vehicle wheels, I consider it a duty I owe your firm to tender my sincere thanks for the interest and pains you have taken in the prosecution of the case. I shall cheerfully recommend your firm to such as may need your services. I remain yours,

Very Respectfully, WM. THUNEN.

OFFICE OF THE

VULCAN POWDER COMPANY,

San Francisco, Feb. 17, 1879.

To the real mining public it is unnecessary to state that Vulcan Powder is not new to this coast, having been well and favorably known and largely used by many of its leading mines for over two years.

Vulcan Powder in the past has been the means of assisting the Mining Industries of the Coast in this, that miners can now get better Powder for less money than formerly from a Company which has attempted to monopolize this business, claiming rights entirely outside of either its patents or reissues. Now that the Vulcan Powder Company—joined by prominent mining men, themselves among the largest consumers of Powder on the Coast—has been incorporated, it is perhaps natural that the would-be monopolists should again renew the idle threats with which they have from time to time deluged the mining community, but with what result is best shown by the constantly diminishing sale of their boasted "High-Explosive."

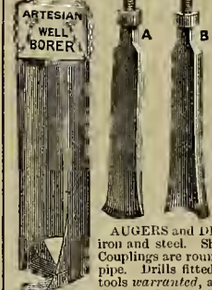
The following are the FACTS as to their infringement suits against Vulcan Powder in the East: In May, 1875, in the Circuit Court for the Southern District of New York, General Newton, the United States Engineer in charge of the "Hell Gate excavations," and the same Mr. R. W. Warren, now Manager of the Vulcan Powder Company, were sued as co-defendants for making and using the same Vulcan Powder by the Atlantic Giant Powder Co. A decision on this, the main case, brought against Vulcan Powder, was ardently desired by us. But when the case was placed on the calendar, the Atlantic Giant Powder Company WITHDREW THEIR COMPLAINT. The decisions referred to in recent advertisements as against Vulcan Powder, had no bearing on the real issue, else why has this Company not been DIRECTLY attacked long ere this?

As regards the recent decisions of the United States Supreme Court, which the Giant Powder Company says is "calculated to create a false impression," we will say: The Reissues, Nos. 4818-19, which were declared VOID by the decision mentioned, are for the COMPOUNDS WHICH WE ARE MANUFACTURING. Reissue No. 5799 is for a compound (the so-called Giant Powder) WHICH WE NEVER HAVE AND NEVER INTEND TO MANUFACTURE. This is the whole case in a nutshell. We leave all intelligent persons to draw their own conclusions.

We hereby notify all dealers and consumers of Vulcan Powder that we will hold them harmless against any suit the Giant Powder Company may bring against them, and agree to pay all costs of litigation so incurred.

The mining public knows, judging from past experience, that, notwithstanding the promise of *would-be monopolists*, never to "extort high prices," its *only* security against "high prices" is in patronizing the competing company. This matter of the price of Powder is too important to be left to the *sense of justice* of a corporation which claims an oppressive royalty on the Powder business of this Coast.

Vulcan Powder Company,
RALPH L. SHAINWALD,
Secretary.



ARTESIAN AND SURFACE Well-Boring TOOLS.

Manufactured by the Rust Well Auger COMPANY, OF MACON, MO.

AUGERS and DRILLS from best wrought iron and steel. Shafting is 2-inch gas pipe. Couplings are round plugs fitted inside the pipe. Drills fitted for rope or pole. All tools *warranted*, and sold for less money than can be got elsewhere.

Send for Circular. O. RUST, Macon, Mo.

Prompt Attention to Business.

AURORA, Nev., Dec. 7th, 1878.

MESSRS. DEWEY & Co., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

FOR SALE.—4-sided 6-inch Molding Machine. Jackson's Agricultural Machine Works, S. E. corner 6th and Bluxome Sts., San Francisco.

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Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

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Of all sizes on hand or made to order.

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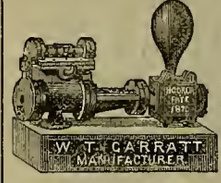
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.



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For Mining and Farming Purposes.

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LEAVE STOCKTON
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Agents for the Allen Engine Governor, Bailey Air Compressor, Howell's Improved White Furnaces, Walker's Compound Steam Pumps, Etc.

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Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

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Double C. Reversible. 5½x12, 6x12, 7x12, 8x12, 9x14, 10x14 / 7x12, 8x12, 9x14, 10x14

ALL SIZES **Hoisting Engines** FOR SALE BY BERRY & PLACE

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From ¼ to 10,000 lbs. weight, true to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Send for circular and price list to

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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GOLD MINE WANTED.

One now paying more than expenses. Addres

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A. L. FISH & CO., 9 and 11 First St., S. F., Cal.

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Air Compressors AND AIR COLUMN,

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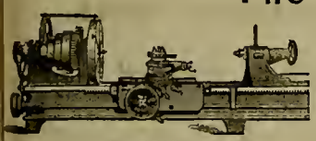
STEAM **Fire Engines,** AND Hose Carts.



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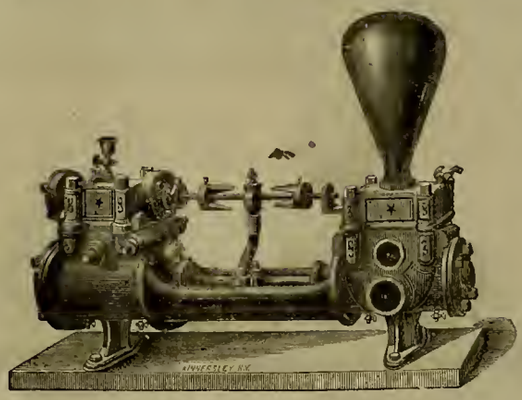
KNOWLES PATENT STEAM PUMP.



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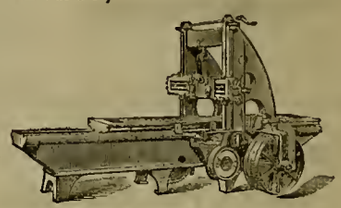
Waters' Perfect ENGINE GOVERNOR.



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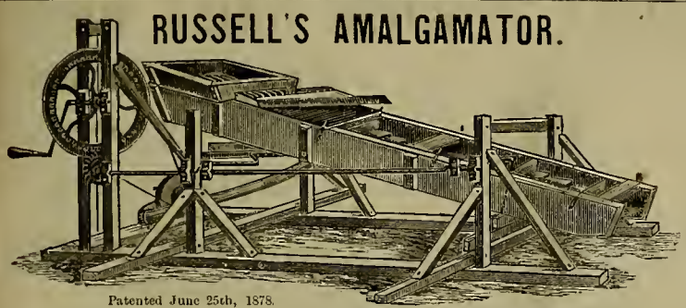

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Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

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In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

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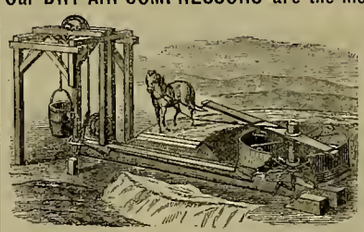
Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



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This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

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GOLD, SILVER AND COPPER MINING, Reducing and Concentration Machinery.

Hoisting Engines, Diamond Pointed Rock Drills, Manufactured by M. C. BULLOCK,

Address, FRASER, CHALMERS & CO., Chicago, Ill.

San Francisco Pioneer Screen Works,

J. W. QUICK, MANUFACTURER,

SCREENS

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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PROMPT AND SUCCESSFUL.—*Messrs. Dewey & Co.*:—Gentlemen: Your Circular letter, 12th inst., informing me of successful termination of my applicatiou for patent received. Please accept thanks for the prompt and successful manner in which you have managed this business Yours respectfully, J. H. CAVANAUGH.
Walla Walla, Dec 24th.

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All sizes, and adapted to from 3 to 500 feet head.

TURBINE Water Wheels

THE BEST IN THE WORLD!

Send for our Circular and Prices.

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The best Work done on the most reasonable terms on the Coast.

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Orders for agricultural and scientific books in general will be supplied through this office at published rates.

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BURLEIGH ROCK DRILL,
Does more work at Less Cost
THAN ANY OTHER ROCK DRILL.

FIRE ENGINES,

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AIR COMPRESSORS and ROCK DRILLS.

HOISTING ENGINES,

ALL SIZES, DOUBLE AND SINGLE, WITH SINGLE and DOUBLE REELS.

Pressure Blowers. Diamond Anti-Friction Metal. Flexible Shafts.

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And
AIR
COLUMN.

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And
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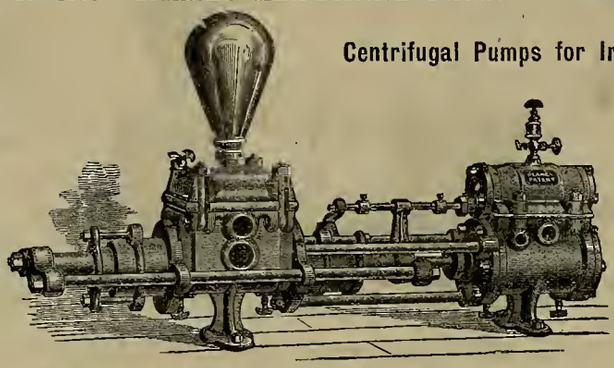
Trucks.



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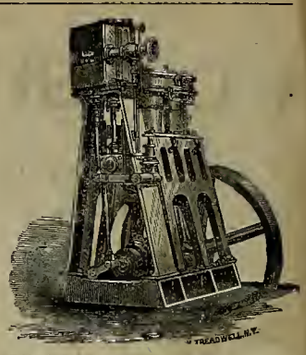
VERTICAL AND HORIZONTAL.



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Gives Better Results than any Compressor Known.

Putnam's Wood-Working Machinery.

MACHINISTS' TOOLS.

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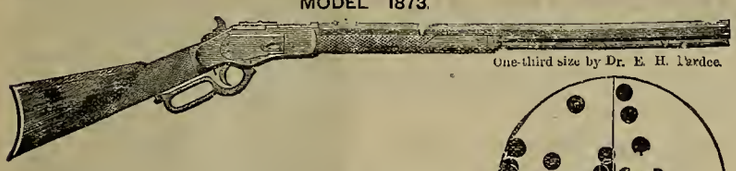
HILL'S EXPLODERS.

SEND FOR CIRCULARS.

Winchester Repeating Rifle,

MODEL 1873.



One-third size by Dr. E. H. Pardee.

String measuring from center of target to center of each shot, 32 inches. Average distance of each shot, 1 9-100 inches.

The Strength of All its Parts,

The Simplicity of Its Construction,

The Rapidity of its Fire,

The Power and Accuracy of its Discharge,

The Impossibility of Accident in Loading,

Commend it to the attention of all who use a Rifle, either for Hunting, Defense, or Target Shooting.

The San Francisco Agency is now fully supplied with all the various kinds and styles of Arms manufactured by the Winchester Repeating Arms Company, to wit:

Round barrels, plain and set, 24 inch—blued. Octagon barrel, plain, 24 inch—blued. Octagon barrel, set 24, 26, 28, 30 inch—blued. Octagon barrel, set extra heavy, 24, 26, 28, 30 inch—blued. Octagon barrel, set, 24 26, 28, 30—extra finished, case hardened and check stocks. Octagon barrel, set extra heavy, 24, 26, 28, 30 inch—extra finished—C. H. & C. S. Octagon barrel, set, 24, 26, 28, 30 inch—beautifully finished—C. H. & C. S., known as "One of One Thousand." Octagon barrel, set, gold, silver and nickel plated and engraved. Carbines blued, also gold, silver and nickel plated. Military rifle muskets, model 1873. Rifles, muskets and carbines, model 1866. RELOADING TOOLS, PRIMERS AND PARTS OF ARMS.

A heavy stock of Cartridges Manufactured by the W. R. A. Co., for all kinds of Rifles and Pistols, constantly on hand and warranted the best in the market.

Sole Agent for Dupont's Mining, Blasting, Cannon, and Celebrated Brands of Sporting Powder,

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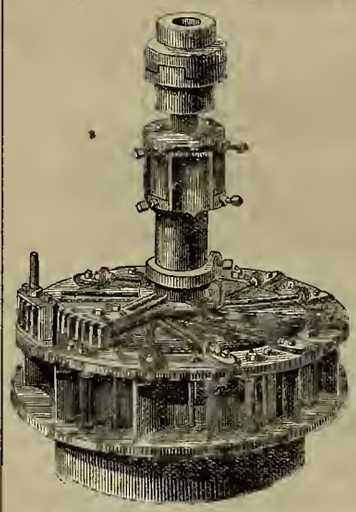
SOLE AGENT FOR THE PACIFIC COAST.

LEFFEL'S IMPROVED WATER WHEEL.



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Write us for Pamphlet of our celebrated Leffel Turbine

WATER WHEEL.

Great Reduction of Prices FOR 1879.

NEW SHOPS
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NEW MACHINERY
ENABLES US TO MAKE THE

Best and Cheapest Wheel

In the Market, Write to

JAMES LEFFEL & CO., Springfield, Ohio, or 109 Liberty St., N. Y.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive.

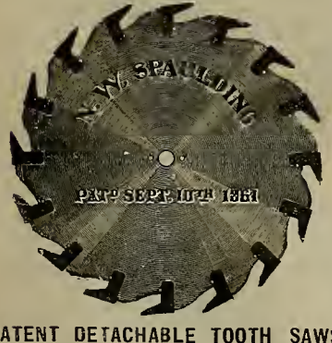
Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO., San Francisco.

N. W. SPAULDING'S



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VULCAN BLASTING POWDER.

The strongest and most economical explosive in use.

Wherever it has been given a test, it has surpassed all other high explosives.

Works at SAN PABLO, California, and RENO, Nevada. | Office, No. 123 California Street, SAN FRANCISCO.

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Governor

These Steam Governors have long been known as THE BEST, and as lately Improved and Perfected, they have no Rival.

THE SAFETY STOP

On these Governors is alone worth double the price of the Governor. We have sold over six hundred, and

Never one has Failed.

They are sold at the same price (or less) as ordinary Governors. Send for Circular.

BERRY & PLACE,
Market, head of Front St., San Francisco

Engraving done at this office.

PALACE RESTAURANT

218 Sansome St.

This elegant and spacious S. F. Restaurant has been re-opened with superior bill of fare daily, and is now the best and most popular dining saloon on this Coast.

Good Living at Reduced Prices

[Lunch ready at 10 A. M.] Resident business men and visitors from abroad will be wise in giving this place an early call. Examine bill of fare and prices.

HERMAN H. HORST, Prop'r.

This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y.

P. P. CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 202 Sansome St., room 7.

TO MINING MEN!

All who are interested in improved Mining Machinery, are requested to examine one of the largest size of

PAUL'S PULVERIZING BARREL,

Which can be seen (prior to shipment), at the Golden State and Miners' Foundry, 237 First Street, near Howard.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, MARCH 1, 1879. VOLUME XXXVIII Number 9.

Hughes' Fog Signal Compass.

A Ready Meane of Avoiding Collision of Veseele in Foggy Weather.

Capt. William Hughes, who has been for many years captain on the line of ferry eteamers bctwcen thie city and Oaklaud, and who has plenty of opportunity for knowing the difficulties of finding the way from wharf to wharf in thick weather, has devised a fog eignal compass, with which by very eimple means, danger of collision may he avoided. Numerous attempte have bcen made to perfect a codo of signals, by which veseels can determiue the position or couree of other veseels in a fog, but moet of them are either too complicated or otherwise impracticable. Capt. Hughee has invented a system which eeeme perfectly eimple, and in which the course to pursue ie as plain as the compaes poiute, and, iu fact, is printed on the compass.

The difficulty is usually to tell what course the other vessel ie on when two are approaching each other in thick weather. Collieions frequently occur between eteamers even when the respective captains kuow of the proximity of the veseels by the eound of the whietles. In foggy weather the *direction* of eound ie difficult to determine, and while it may appear to come from off the port bow for instance, it may really be off the etarboard bow or dead ahead, and the actual position or course of tho other veesel may not he determined until too late to avert collision. This was the caee in the recent collieion between the *Alameda* and *El Capitan* in San Francieco bay. If, however, the mastere could indicate to each other by any simple eetablished code of eignale the course of each veseel, euch collisione could be avoided.

It ie thie that Capt. Hughes' eystem doea. He makes the code of eignals unmistakeable in its character, and eimple to carry out hy means of an improved compass card, wbich is used ou any compaee, and in no way changes any of the exieting conditions of pointe of compaee or Government rules. A fac simile of this card is ehown in the engraving.

On the outer circle of the compass card are the usual marks and letters indicating the pointe of compass. Just inside of this outer circle ie another circle, in which ie printed a eeries of arbitrary numbers, whicb correspond to definite points of the compass, eaid figures beiug printed on the eame place on all carde alike, with relation to the eame pointe.

We append a fac eimile of the key from which, even those not familiar with nautical mattere, may understand bow the eystem works :

Key to Captain Wm. Hughes' Fog Signal Compaes.

Sounds.	Number.	Course.
11—1—11	212	N
1—11	12	N by E
1—111	13	NNE
1—1111	14	NE by N
1—11—1	121	NE
1—11111	15	NE by E
1—111111	16	ENE
1—1111111	17	E by N
111	3	E
11—1	21	E by S
11—11	22	ESE
11—111	23	SE by E
1111	4	SE
11—1111	24	SE by S
11—11111	25	SSE
11—111111	26	S by E
11111	5	S
111—1	31	S by W
111—11	32	SSW
111—111	33	S W by S
111111	6	SW
111—1111	34	SW by W
111—11111	35	WSW
1111—1	41	W by S
111111	7	W
1111—11	42	W by N
1111—111	43	WNW
1111—1111	44	NW by W
11111111	8	NW
11111—1	51	NW by N
11111—11	52	NNW
11111—111	53	N by W

1—11—11	TO STOP HER	122
11—11—11	TO BACK HER	222
11—11—111	AT ANCHOR	223

1 WHISTLE STARBOARD.
2 WHISTLES PORT.

Distress Signal—A succession of single sounds.

The above ie on a eeparate card, whicb may be on the ineide of the cover of the compaes box or any convenient place where it and the compaee may be eecn at the eame time, and ie the key to tbe figuree on the compase card, which indicatee what eounde to make with whietle, bell or fog horn, to correepond with tho figures and points of compass on the card. It ie only neceeeary to look at the key once to understand it, as the numbers, etc., are all contained on the compass card.

The use of the compase may be underetood from the following examplee: Suppoee for instauce a veeeel is eteering due north in a fog, and the maeter wishes to indicate to another veseel the course he is on. Thie compase pointe north, and under this point on the compaee card are the figurce 212. He then eounde 212 by the whietle, in the manner indicated on the key, viz : two distinct sounde by the whistle, and then an interval ; then a eingle note followed by an interval ; and then two coneecutive notee, eaid eounds repreeenting the numerale 212. The master of the other veseel hearing the whietle sounded in thie way, looke at his compass for the corresponding number, which telle him that the vessel from which the eound comee ie eteering due north. Again, north by eaet, is indicated by the numerals 12, and by the sound of a eingle note followed by an interval, and then two consecutive notes. The course northeast by north is represented by the number 15, which is indicated by one einglo notc, and after an interval, five succeeive notes. All the different points of the compass have their respective figuree marked on the circle as described, and the key showe the method of sounding any desired one.

CAPTAIN WM. HUGHES' FOG SIGNAL COMPASS.

The sounde are made on the same principle as the fire alarm bell iudicates the district in which a fire has occurred, and directs the firemen which way to go. These sounds indicate to others which way the vessel, from which they come, ie going. The intervale of eounds are ehown very plainly on the key.

There is never any doubt which one to eound, for it is indicated on the compaes for any course the veeecl is eteering ; and the master of each veesel can tell which course the other ie pursuing.

In the center of the compass card is a circle having several phrasee printed with correeponding numbers to he used in the eame way. For inetance, the words "To etop her," are represented by the number 122, eounded by a single note, followed by an interval; then two notee and an interval, and then two more notes. "To back her," is represented by the numbere 222, and "At anchor," hy the numbers 223, which may be eounded in the manner described. These phrases repreeent that the veesel eounding the numbers is etopping, ie being backed, or ie at anchor, as the case may be. The "dietreee signal" is a eucceseion of sounds repeated rapidly. On another circle are printed the worde and figuree, "1, Starboard" and "2, Port," on oppoeite eides of the cards, which are the ueual eignals for eteamers to pase to etarboard or port.

These eound eymbole will indicate on dark nights or in foggy weather the poeition and couree of vessels, so that they may pass and repass without danger of collision, each knowing what the other ie doing and what couree he is on although not in eight.

The etarboard eignal (1) ie eounded at all timee in thick weather and when any approaching sound should be heard, the course ehould be immediately eounded as described to indicate the couree of the veeeel.

Thie code of eignale would prevent accidente from collisions in a fleet of veesele eailing in the eame general direction in company with each other, ae in the case of a war fleet. The recent collision between the war veeeels *Kœnig Wilhelm and Grosser Kurfurst*, when 300 livee were lost, might have been prevented could the course of the respective veseels have been determined by the other master. They were steering at an angle toward each other in a fog and collidcd. With a code of signale which would have indicated tbe couree, they would not have steered across each other, but the coureee would have been altered eo as to be parallel, or the veesele eteered at a slight angle away from each other.

This eyetem doee not in anyway interfere with any of the ordinary rules governing navigation, or alter the compass. The printed matter on the compass card is merely eupplemental, put there for immediate convenient reference, and because the eame conditione exist in all compasses alike. When vessele find that they are steering towards each other they can each alter the couree, which fact the other one immediately knows as the eignal ie changed to correspond, and collieions are avoided.

Thie eyetem is more fully perfected than any yet made public and has the merit of eimplicity as a guide for steamehips and eailing ehips steered by compass in foggy weather. Had it been in uee on our local ferry, the accident the other day would have been avoided, as the respective captaine could have told by their compasses that they were eteering at an angle toward each other, and no matter where they each thought the other eteamers were, would have altered the couree eo ae to have steered at an angle away from each other. Or they could have signaled to have stopped or to have backed if neceseary, in the manner indicated on the card.

LEAD ie again in active demand in New York.

Mining in British Columbia.

According to lateet advicee from the Caribou region, mining operations of most kinds had about ceaeed there for the eeason. But little allueion ie made to the metalliferoue veine reported to have been diecovered there last year, leaving ue to infer that not much hae yet been done in that department of miuing. The bueineee eeeme, however, to be progressing fairly at one or two pointe at leaet. At last accounte tho Beedy mill on Burns' mountain was crueh-ing splendid rock, and expected a large clean-up in a few daye. The Enterprise Co.'e minee at Ieland mountain were still being worked vigorously, the ore heing hauled to the mill, a distance of two and one-third miles. The Proeperine Co. were making efforts to open their mine and develop their property. The work, however, proceeded elowly, as the company do not deeire to precipitate operatione and thereby render assessments too heavy. The Pereevcrance Co. had etarted up, and the queetion whether it is better to run a tunnel or sink on the ledge will ehortly be dctermined.

Wbile eome of the companiee engaged at placer mining in that section bave done tolerably well the past year, othere bave taken out hut little or no gold. Among the more successful companies wasbing on William'e creek the Bedrock Flume and the Black Jack are mentioned, which with one or two othere bad made large wagee, coneidering the scarcity of water towards the end of the season, much of the washing being now performed there by the hydraulic methed. Some of the companiee engaged in opening deep claime continue work througbout the winter, eome of theee claime being worked through ehafts and othere through tunnel.

The inhabitants of Caribou bave petitioned the Dominion government, praying for tbe appropriation of a eufficient eum to remove the rocks in Cottonwood canyon in the Fraser—an operation which, if eucceesful, would render that river navigable from Soda creek to the Fort George canyon, and be a great benefit to the mining section above Quesnelmouth.

THE LATEST WONDER IN ARIZONA.—The most recent novelty announced in Arizona is the discovery made at Mountain Spring Station, of either a very old and exteneive mine or a very wonderful cave, being very curioue whichever it ie. Thie opening hae a fine arcbed entrance, cut apparently out of the solid rock. At a point about 40 feet in from the mouth a room about 75 feet equare is reached, from which several halls or tunnels branch out. Seme of these have been explored for a dietance of 200 and 300 feet. There are several ehafts indicative of artificial workings. The incline of the tunnel is about 10 feet to the 100. The main cave or tunnel has been explored for about 500 feet from the entrance. The ceiling is in a red epar and in the side tunnele are numbere of beautiful etalactitee and incruetations. The direction of the excavation is toward a large ledge of mineral matter about a quarter of a mile from the entrance. Everything here eeems to point to this having been a miue rather than a natural cave. In such case it is douhly intereeting as a reminder of tho extiuct race which is known to have once iuhahited that region. A more thorougb exploration of the place is soon to be made.

THE New Almaden and the Enriquita quicksilver minee produced from January 1st, 1850 to Deccmher 31et, 1877, 650,898 flaske of metal, nearly all of it coming from tbe former. The higheet wholeeale rates at which quicksilver eold in San Francieco wae $1.50 per pound, and the loweet 40 cente, the present price.

A GENTLEMAN in Dayton, Ohio, who ten years ago became guardian of his granddaughter and took charge of the estate of $20,000 left her by her father, has juet surrendered it, increased to $40,000, upon her attaining her majority.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Arizona.

Editors Press:—Salt River valley, whence I write, and of which Phenix is the business center, constitutes, no doubt, the finest farming district in Arizona. The farmers here raise, with the help of irrigation, excellent crops, and are getting rich, as they find close at hand good markets for their produce at remunerative prices. They are therefore all right. I wish I could say as much for the generality of miners in this section of the Territory, of whom there are here a great number out of employment, and not a few hard up for the means for keeping soul and body together. The newspapers, by their constantly blowing about the great mineral wealth of this Territory, the fine openings presented for miners, etc., have caused more of people to come here than can find employment or employ themselves to advantage. The result is, we have lots of good, industrious men willing to work for their board, as many of them are now doing in this valley, where there is, of course, plenty to eat.

Another cause of hard times here has been the failure of the McCracken, the Signal, and the Golden Store mining companies up in the Hualapais district, which, after paying off their employees, and in other ways pushing into circulation nearly a million dollars of their worthless paper, closed down and left the holders in the lurch. Notwithstanding the big stories told about the yield of the mines here, the Tiptop is, I believe, the only company that pays promptly; while there are several companies here that are doing remarkably well, a much larger number are doing but little, the great majority nothing at all. There are good mines all over this Territory, but they have, at present, to be worked under so many disadvantages that it is hard to make them pay. When more mills and reduction works have been introduced into the country, and the railroad reaches the mining districts, the mines here can be worked with profit. Until then mining will be an uphill business, with some big successes and a great many failures. H. R. E.

Phenix, Arizona, Feb. 12th, 1879.

Letter from Colorado.

Leadville and Vicinity.

Editors Press:—This State is just now attracting much attention on all hands. As a bullion producer, she ranks third in the Union. The rush thither is by far the greatest seen for the past seven years, due in great measure to the wonderfully productive mines at Leadville.

Some $3,000,000 worth of gold had been washed from the creek, that passes through the town, before the silver mines were discovered. The silver deposits lie mostly between lime and porphyry, although some have a clay or gravel roof.

Mt. Bross and Mt. Lincoln Mines, in Park County.

The Con. Danville mines, on north spur of Mt. Lincoln, are producing finely, although most of the work being done here is prospecting, to prove up what they have. This property comprises about 45 acres of ground, all of which has been proven rich by drifts run in on the ore. There are at least 35 openings, nearly every one of which has exposed to view good mineral, varying in thickness from five inches to seven feet. The ore sells here from $50 to $500 per ton, averages about $140 per ton.

The actual yield of this property for the past six years, and from the average work of five men, is $141,500. A short time ago the owner, to test how much money he could take out in a short time, put five men on his best looking ore, and extracted in 70 days $23,000, receiving the money for it.

The Russian mine, corners with the Con. Danville, works from 15 to 30 men, and has produced several hundred thousand dollars. It has enough ore in sight to keep them breaking for five or six months to come.

The Gertrude has been idle for several years, but has just been reopened by lease, and a large body of gray copper ore, rich in silver, exposed, which promises to produce as in years past.

The Moose, on Mt. Bross, I am informed yielded in December more freely than for any month of the past year. This property has produced several millions of dollars in silver ore since its discovery in 1870—works over 100 men.

The Dolly Varden, same locality, has produced largely. It was in poor ore for some months last spring, but has struck it rich again, and is shipping ore regularly—works about 25 men.

Several other mines are being worked on these mountains, but those mentioned above are the largest producers. There are not less than 50 good mines on these two mountains. The present workings of these mines are in the devonian and carboniferous formations, although, it is now proven beyond a doubt that in the lower silurian formation there are fissure veins that have produced the large deposits now being worked. Oxide.

Alma, Park Co., Colorado, Feb. 3d, 1879.

Igneous Meteors.—No. 2.

[Written for the Mining and Scientific Press.]

Actual Size of Igneous Meteors.

Of course, we know nothing of the actual dimensions or masses, of such igneous meteors, as do *not* reach the surface of the earth. The meteoric stones which have fallen on the earth, vary in weight from a few ounces to several tons. The Swedish Arctic expedition of 1870, brought from Greenland several specimens of meteoric iron, the largest weighed 25 tons, and next in weight, 10 tons. There is an aerolite in the British Museum, which weighs five tons; one in the St. Petersburg Museum, weighing 1,680 pounds, which was found in Siberia in 1772; and one in the New Haven Museum, weighing 1,635 pounds, which fell in Texas in 1808. Some of the largest of such masses are composed of nearly pure *metallic iron*. One of them, the Ainsa (Tucson) meteoric iron, now at the Smithsonian Institution, weighs about 1,600 pounds; and another, the Carleton (Tucson) meteoric iron, weighs about 632 pounds, and was in the Mayor's office in San Francisco a few years ago. A mass of meteoric iron was found in 1872, near Shingle Springs, El Dorado county, California, weighing about 85 pounds.

Origin of Igneous Meteors.

The older philosophers framed various theories to explain these remarkable phenomena, which partook more or less of the progress made in the various branches of physical science. About the middle of the last century, when the effects and phenomena of electricity began to be better understood, Beccaria and Vassali, among others, regarded the shooting-stars as nothing more than electrical sparks; an hypothesis which was soon shown to be untenable. At a later period, when the inflammable nature of the gases became known, Lavoisier, Volta, Herbert, Toaldo, Gren, and others, referred these meteors to hydrogen gas, which, by reason of its small density, they supposed must be accumulated in the higher regions of the atmosphere. Dalton's discoveries exploded the physical basis of this theory. Deluc maintained that certain phosphoric exhalations generated in the earth, and becoming inflamed in the sky, formed the true essence of the shooting-stars.

With regard to aerolites, it was at one time supposed that they were also of terrestrial origin. Some imagined that they were formed in the upper strata of our atmosphere by the condensation of the vapors of solids (which were supposed to be mixed with the air), as hail-stones are formed by condensation and congelation of aqueous vapors; while others supposed them to be masses ejected from terrestrial volcanoes to an immense hight above the limits of the atmosphere, and again descending after having described several revolutions about the earth. But none of the crude theories ascribing a terrestrial origin to the various kinds of igneous meteors were able to withstand the scrutiny of exact observation and calculation, and were successively exploded by the progress of exact knowledge.

Lunar Origin.

Looking to extra-terrestrial sources for the origin of these meteors, we find that the hypothesis of the lunar origin of aerolites was originally proposed as early as 1660, by an Italian philosopher named Terzago, and reproduced by Olbers in 1795, although subsequently abandoned by the latter. This theory was sustained by the illustrious Laplace, and also by Berzelius on chemical grounds. The idea was that such masses were ejected from lunar volcanoes with sufficient velocity to pass the point of equal attraction between the earth and moon (about 24,000 miles from the center of the moon), in which case they would be brought to the earth by terrestrial gravity. It may be remarked that no improbable amount of mechanical force would be required to project a mass from the lunar surface to this point. Considering the small intensity of lunar gravity, and the absence of an atmosphere about the moon adequate to offer sensible resistance to the motion of a solid body, the force required is only that which would be sufficient to overcome the moon's feeble attraction. Calculation shows that a body projected from the lunar surface with a velocity of about 7,335 feet per second would not fall back on the surface of the moon, but would be brought under the influence of terrestrial attraction. This velocity is quite conceivable, as it is only about four times the initial speed of a cannon ball. The strongest arguments in favor of the lunar origin of aerolites are derived from the remarkable similarity of chemical constitution of the stony and ferruginous meteoric masses which have fallen on the surface of the earth; such a similarity of composition very significantly indicating a community of origin.

Objections to the Theory of Lunar Origin.

The most serious objections to the lunar origin of aerolites, as well as shooting-stars, arise from the truly planetary velocity of these igneous meteors. All the best and most trustworthy observations concur in establishing the fact that all classes of igneous meteors reach the superior portions of the earth's atmosphere with velocities frequently exceeding 20 miles per second. Now, as it is impossible for the action of terrestrial gravity to impart anything like so high a velocity to a falling mass, this physical objection seems to be overwhelmingly fatal to the theory of a lunar origin. It is desirable to place the force of this objection in a light more intelligible to the popular mind. The fundamental laws of dynamics assure us that the greatest possible velocity which a body could acquire in falling, under the influence of terrestrial attraction, from infinite distance to the surface of the earth, is about 6.9504 miles per second. The same principles also assure us that the utmost velocity which a body could acquire, in falling from the point of equal attraction between the earth and moon (about 210,000 miles above the earth's surface) to the surface of the earth, is about 6.8858 miles per second. Hence it follows that any meteoric matter which is observed to enter our atmosphere with an absolute velocity greater than about seven miles per second, could not have acquired such velocity by the action of terrestrial attraction. In order to enter our atmosphere with a velocity of 20 miles per second, calculation shows that, if such masses came from the moon they must have been projected from the lunar surface with a velocity of about 120,000 feet per second; which may be regarded as well nigh impossible.

It thus appears that those igneous meteors which have the planetary velocity of from 15 to 40 miles per second, cannot, with any probability, be regarded as having their origin in the moon. Whether any individual bodies moving with smaller velocities may have a lunar origin, is a question which cannot be satisfactorily answered in the existing state of physical science. "To me," says Olbers, "it does not appear at all probable; and I regard the moon, in its present circumstances, as an extremely peaceable neighbor, which, from its want of water and atmosphere, is no longer capable of any strong explosions."

Cosmical Origin.

The immortal Kepler imagined that there were more comets and smaller bodies flying about in space than there are fishes in the ocean. Halley, Wallis, Pringle, Maskelyne and others assigned a cosmical origin to igneous meteors, but without suspecting that masses of stone and iron fell from them. About the year 1819, Chladni announced that all classes of igneous meteors were, probably, of cosmical origin; in fact, that they were meteor-planets, of all imaginable sizes, revolving about our sun in elliptical orbits, and which, from time to time, became entangled in the atmosphere of the earth. The planetary and even cometary velocity of meteors compelled many physical philosophers, as Olbers and Arago, who at one period favored their lunar origin, to abandon the moon-theory for the more probable cosmical origin. The similarity of chemical constitution in aerolites is, after all, not so formidable an argument in support of a lunar origin; for, as Sears C. Walker justly observes, "we may as well suppose a uniformity of constituents in cosmical as in lunar substances."

Moreover, the periodical star-showers, as those of November and August, and the probable connection of igneous meteors with certain comets, point, in a significant manner, to a cosmical origin. In fact, there is now every probability in assuming that, independently of the planetary masses, there exist in the interplanetary regions myriads of small bodies which circulate about the sun, generally in groups of zones; and that some of these zones intersect the orbit of the earth, and are consequently encountered by the earth in its annual revolution.

Origin of Heat and Light.

We have seen that igneous meteors enter the upper strata of our atmosphere with velocities varying from 5 to 30 or even 40 miles per second. The enormous resistance encountered by such bodies in traversing the air, speedily extinguishes this high velocity, so that they retain but a comparatively moderate velocity on reaching the surface of the earth. In this enormous resistance and consequent loss of energy we find a satisfactory explanation of the thermic and luminous phenomena attending the fall of meteors.

The "Dynamical Theory of Heat" assures us that the energy lost by the moving body in traversing the atmosphere is transformed into heat, which is either retained by the body or is communicated to the air. The amount of heat thus generated can be estimated provided the diminution of velocity and the mass of the moving body are known. If we assume all of the heat evolved to be retained by the moving body, the increase of temperature can be computed, when the specific heat of the meteor is known: under this assumption, the increase of temperature would be independent of the mass of moving body. To apply these principles to the case of meteors traversing the atmosphere, let us assume—

Velocity on entering atmosphere.. 30 kilometers per sec.
" near earth's surface.....500 meters per second.
Specific heat of meteor.....0.22 (water = 1).

With these data, assuming all the heat generated to be retained by the moving body, calculation shows that the increase of temperature of the body would be nearly 500,000 degrees Centigrade! (For details of this calculation see *Nature*, for May 23d, 1872, p. 72.) Of course, by far the larger portion of the heat generated by the loss of energy of the moving meteor would be imparted to the air along its trajectory; but assuming that only 1-100th part of it is retained by the meteoric mass, it would be more than sufficient to account for the phenomena of fusion, detonation and brilliant light which frequently accompany the transit of such bodies through our atmosphere.

In the case of small masses it is clear that their high velocities would be more rapidly extinguished by the resistance of the air than in the case of large masses. Hence, in the small mass, the transformation of energy into heat being accomplished in a shorter time, a greater amount of the evolved heat would be retained by the moving body, than in the large mass whose velocity is more gradually checked by the resisting medium. When, therefore, the smaller masses plunge into the upper atmosphere, the matter may be volatilized by the intensity of the suddenly-evolved heat. In the minutely-divided condition in which the material of the meteor would exist after the condensation of the vapors thus formed, it would float about in the atmosphere, and ultimately reach the surface of the earth in the form of meteoric dust. The existence of such mechanically-suspended matters in our atmosphere has been revealed by the refined methods of modern research.

Thus the phenomena of the occasional fall of meteoric stones, and the almost incessant appearance of the shooting-stars which nightly furrow the celestial vault, may be correlated with the principle of transformation of energy; and all the luminous, thermic and detonating phenomena attending the fall of such bodies in our atmosphere, seem to be fully accounted for by the enormous amount of heat thus generated by their passage through the air. According to this view, the shooting stars are nothing more than small meteoric stones which are volatilized and utterly dissipated in the upper regions of the atmosphere long before reaching the surface of the earth; only the larger masses ever come down, as such, to *terra firma*.

The origin of the luminous train seems to be due to the intense heat developed on the anterior surface of the moving mass, melting this portion of the same, and the fused matter being wiped off by the resisting air, streams back, forming the train of the meteor.

Numbers of Igneous Meteors.

It has been estimated that the number of meteors that enter our atmosphere per day cannot be less than 10,000,000. "If we include those smaller meteors which are seen only in the telescope, that number may be multiplied 20 or 40 fold." Those who were fortunate enough to witness the famous star-shower of the 13th of November, 1833, can well appreciate the vastness of numbers which entered our atmosphere in the course of a single minute of time. A single glance of the eye to the celestial vault, on that occasion, revealed thousands of these meteors traversing the heavens in various quarters.

Hence it is evident that the atmosphere which envelops our planet plays an important part in shielding its denizens from the destructive effects of these extra-terrestrial projectiles. But for the action of the air in arresting and destroying these meteors, we should be intolerably bombarded with them. The absence of an atmosphere about our planetary companion, the moon, must render her liable to be fearfully pelted with these minute celestial visitors.

The Earth and Man

The earth is but to the universe as a grain of sand is to the seashore, yet insignificant as it may seem in such a comparison, it is, nevertheless, when surveyed by finite minds, a globe of no mean proportions. This mundane sphere contains 2,662 geographical cubic miles! In the mere expression of figures no particular vastness may here seem to be implied, but let us analyze the proportions of a cubic mile and our ideas will not only alter in this respect, but we will stand aghast at the magnitude of this globe, which revolves with such awful silence every 24 hours. Imagine a chest or box to have the length, width and depth of but one of these miles, and then let us see what it would contain.

To begin, cast in all the factories, public buildings, monuments, private dwellings, railways, nay, everything that has been built by man in America, add to that those of Asia, Africa and Australia, and the work is but begun. Take up the churches, towers and all other structures in London, Paris, Berlin, Hamburg, St. Petersburg, Constantinople—in short, those of every city and town in Europe. Add to that all the steamers and vessels on the ocean. What is the result? Our trunk is scarce half full!

Let us now avail ourselves of the human race. Pack them like herring in rows, and put 12,000 in a row—4,000 of these rows make one stratum of 48,000,000—just room enough for the Americans. Between each layer (to make a neat job) let us sprinkle straw and dry leaves 30 feet between each layer (which would require all there is in the world), and then pack in the 3,000,000 of Australians and 45,000,000 Asiatics, and this will complete the second stratum—and thus continue until you have the remaining 600,000,000 Asiatics, and the remainder of population, making in all 1,400,000,000 in about 30 strata. Now the chest is about half full, and it would require about 15 times the number of men to fill the remaining space. What shall we do to complete the work? Happy thought. Let us take the animals! But, oh cruel disappointment! even if we include the whole living creation, our chest will by no means be filled. And all this is but one geographical cubic mile, of which the earth contains 2,662.—*Exchange.*

MECHANICAL PROGRESS.

Room for Invention.

We frequently hear the remark that the time will soon come when the course of invention will be run; when, like Alexander, inventive genius will weep, because there are no more worlds to conquer. The fact that iron fingers have in so many branches of industry been made to perform tasks once done by bone and sinew; that electric throbbings have outstripped the fleet messenger in business affairs, and the iron horse with food of burning coals carries the love-letter and the meal-sack, where once the out-fed country steed galloped along the hard-beaten road. Those facts are impressive and suggestive, but not convincing on the subject of an ultimate limit to inventive usefulness or inventive power. The ball of progress in rolling along has wrapped about it many a layer of ideas formed into tangible facts; but the periphery grows, and the capacity for enlargement grows with it. As the circle of knowledge widens, the illimitable space beyond still more increases, and there is both more to learn and greater ability to learn it. If the *needs* of man were the sole gauge of his demands, there might well be a point at which invention, satisfied with granting all needful things, would be compelled to rest. But "to want" means both "to lack" and "to desire;" the food and shelter and clothing absolutely requisite develop into luxuries of palate and æsthetic taste. The rude needle of bone that sewed with sinew the boar-skin cloak and made of it a definite garment, was an invention that might have sufficed in its line, had the skin-garment satisfied; but demand and supply are commensurately progressive; each surpasses each, onward in the march of progress; and now we have that household companion, the sewing machine, purring like a kitten, while basting, sewing, hemming, gathering, tidily at high speed; this modern sewing machine being as legitimately the development of the bone needle, as the fashionable garment of to-day is the outgrowth of the fig leaf of Eve and the skin covering of her son.

Our wants have become artificial. With successive generations, luxuries develop into customary grants and eventually become necessities. Our condition is ameliorated, and hence our appreciation sharpened, while certain faculties have become dulled and invention must supply their places or their deficiencies. Where invention has produced an effect, it is for invention to extend and perfect it. Thus, in every walk of life it is for cunning brain and deft fingers to effect new combinations or perfect the old, fearless of thwart or limit. In proof that with improvement criticism becomes more keen, and demands more imperative, we have only to look about us for promising fields to engage the inventor. While the harvest of golden grain no longer falls before the classic sickle, and the hay maker has ceased to be a picturesque inspiration for the poet—the root-crops still demand personal delving and grubbing, and the ripened fruits still call for human pickers to pluck them one by one. For the inventors who would devise a mode removing half the blossoms from a peach tree, without injuring the buds which form the next year's bearing stems, there awaits a magnificent prize. Ramie and other fibers still defy the textile art; and the gorgeous aniline dyes fade with a summer's sun. Household fires, once synonyms of health and cheerfulness, are now gloomy and noxious monuments of our heedlessness of things sanitary. Those domestic conveniences that should minister to our comfort and well-being, poison us insidiously but surely. Our vaunted gaslights blacken our paint and kill our window plants, while in the street, the pipes which lead the gas destroy our shade trees. Our sewers and our drains are confounded in name and in use, and both of them are poisonous. Our chimneys breathe forth smoke which is unconsumed fuel, and hence wasteful. Our steam-boilers, with partly consumed fuel, supply our engines with wet steam, and the engines (whose cylinders have to be supplied with oil, through faulty design and workmanship) waste part of the remainder. Our horses, shod with no regard to humanity or for tractive effect, draw wagons or cars which rattle our teeth out, on roads or rails which rattle the vehicle to pieces. The explosives which long ago were constrained to throw hurtful missiles, have but in one instance—blasting—been employed in peaceful work; if we may except the gunpowder pile driver, the precursor of a long line of explosive motors yet to come.

For these and hundreds of other evils, inventive genius must provide the remedy; and as new and artificial wants arise and develop into necessities, upon the inventor, ever in the vanguard, devolves the duty of exploring the land of the possible and providing for the legions of the actual.

It might be said that as science falls into the ranks of knowledge, and art after art is added to the forces of man, the field of true invention would narrow, and that of improvement, combination and application correspondingly widen. And this distinction may not perhaps be improper to draw, nor inappropriate to apply. Certain it is, that as observation and experience lay down the facts, and reason deduces therefrom the theories and evolves from these again the laws which govern things tangible and forces intangible, the plane of the inventer will rise higher and higher, and his usefulness will never diminish. It is to him that races unborn, nations unformed, countries unexplored, look to for their betterment and the achievement of their substantial welfare. Through him the antagonism between man and man—the foul distinctions of caste and class—will be swept away; and better men, under better lives and higher pleasures and comforts, achieve the destiny written for them in the days when the rocky ribs of this earth were formed.—*Polytechnic Review.*

A Planing Machine for Granite.

The Boston *Advertiser* for January 2d, contains, under the head of "Granite Planed Like Wood," an article on a new machine for planing stone rapidly, built on the principle of the wood-planing machine. The article begins by saying that when swiftly revolving knives were first made to do the work of horizontal planes upon plank and board, great wonder was expressed, and the planing machine came at once to be the talk of town and country. We have all become used to that and see no impracticability in the use of steel vs. wood in the rapid displacement of the rough surface of the latter.

Next in order one might reasonably expect that some ingenious man would devise a method for the cutting of soft stone, such as freestone, sandstone, and the like, but that chisels or tools of any sort that could be made, would, when driven, dull quickly, and render the operation practically of little value. Such a plan for the cutting of marble could not be entertained, for the hard material must be removed by well directed strokes from a powerful arm. The inventor of the above mentioned machine has now shown what may be accomplished. Disdaining, as it were, to meddle with softer substances, he selects for the test of his invention the hardest of all—granite, and the hardest granite at that—Hollowell. Easily and simply as the surface is removed from a pine board and caused to fly off in chips, the flinty roughness is made to leave the face of the great block, and only a fine powder remains to prove that a strange work has been done by the ingenious application of steel. "If there could be made a tool that would not require constant watching and very frequent sharpening, you might plane granite," said a practical granite cutter. The inventor showed him that for 45 minutes his machine could run continuously and the tools be uninjured, and he was not a little surprised to note the amount of work done by the machine in that short space of time. The tools can be changed in a few minutes, and the whole machine at once put into operation.

COMPRESSION BY STEAM IN CASTING.—In some recent French experiments it was noticed that when a lid of cast iron was placed upon a mold after casting, the ingot produced generally showed a zone of blow-holes near the surface and on all sides, while within it the block was entirely sound. Whenever the mold was not covered the entire mass contained blow-holes. This, it was urged, was due to the pressure of the gases, and consequently experiments were made by Bouniard with more than 100 tons of steel, which proved that a pressure of 6 to 10 atmospheres acting upon the interior of the ingot would make the metal solid. The mold is covered with a lid in which there is a central casting opening. It has a pipe through which steam may be introduced. The steel is cast through the central orifice, which is closed, and then steam is admitted. A copper wire is used for packing the lid. The work must be rapidly done and the mold be previously heated. In order to make the action of the pressure affect the interior of the ingot the chilling of the surface must be prevented, which is done by heating, before casting, the fire-brick lining of the inner surface of the lid. The ingot thus cast shows a depression on its upper surface. It was found that in using steel for cannons the number of compressed ingots rejected was only one-third of the number of ordinary cast ingots. Experiments made to apply the same principle to steel castings showed that although the application was more difficult, the result was the same.

A NEW system of exhaust valves for steam engines has recently been introduced in Germany, which has been pronounced by *Dingler's Poly. Journal* to embody an idea which may prove of great consequence. The admission valves alone are actuated from without by flat slide valves, moved by geared segments, while the exhaust is effected by two valves placed at the two cylinder covers, which are so connected with a double-armed lever placed in the exhaust passage, that when the one valve is closed the other is opened. If, therefore, one exhaust valve is closed by the steam pressure, the other is opened to the exhaust steam, until the steam enters on the other side of the piston, which causes the latter valve to close immediately, while the other is opened full.

GREAT efficiency in steam engines is, according to Mr. Walt, an eminent Liverpool engineer, to be obtained by an increase of pressure and expansion. To accomplish this the point lies not so much with the engine as with the boiler, engineers finding no difficulty in working an engine with steam at 150 or 200 pounds per square inch; and at present he thinks there is no practical limit to the working pressure. Some engineers will be inclined to differ with this opinion, for the management of steam used expansively in simple reciprocating engines at ranges of pressure much exceeding those named, to secure the theoretical economy due to full expansion, would certainly be attended with difficulties.

SCIENTIFIC PROGRESS.

Instantaneous Photography.

The remarkable success attained by Mr. Edward J. Muybridge, of this city, in the production of accurate pictures of horses in rapid motion, has stimulated other persons in a similar direction. The process has recently been applied by Gen. Abbott, of the United States Engineering Corps, for recording the effects of the most sudden and violent explosions by gunpowder and dynamite. The General has shown that however instantaneous an explosion appears to take place, it occupies, notwithstanding, a measurable amount of time, which can be readily measured and the accompanying effects accurately recorded by this new application of the camera.

Among other experiments, Gen. Abbott employed that instrument to make a series of pictures of the different stages of the explosions of submarine torpedoes. In order to accomplish this, according to the *Manufacturer and Builder*, and in order to make six pictures, he had a key-board constructed like that of a piano, consisting of seven keys. The pressure of each of the keys closed a circuit; that of the first key went to the torpedo and exploded it; the remaining six keys were each connected with a fuse, which sustained by a thread the screens of six cameras, prepared to take pictures of the explosion. Any of these keys, when touched, ignited the fuse, which disrupted the thread and dropped the screen; in the latter was a hole, passing before the objective of the camera, giving, during that passage, an exposure of which the time was estimated to be at most the one-twentieth of a second. If, now, the keys of this key-board were rapidly played, all the seven keys could be touched in succession, in any previously determined velocity, always giving first the explosion itself, and then the exposure of its effects in the cameras in successive periods of tenths of seconds, or more or less, as desired.

The first experiment was with the explosion of 500 pounds of dynamite, estimated equal to 5,000 pounds of gunpowder, and the pictures taken at intervals of one-tenth of a second, so that all the successive pictures were taken in not much more than half a second. This is not even a very rapid succession, as almost any pianist can easily play twice as many successive keys in that time. The result was an explosion in the pictures of all the successive results, analyzed and in order. Among other curious effects, the photographs showed that a plane horizontal force was developed by the explosion.

Other experiments showed that depth was an important factor. The torpedoes were exploded near together, one three and the other six feet deep; the first threw up a column of water twice as high as the latter. To ascertain how a torpedo affected a hull, or broke up a ship, two charges of 50 pounds each were placed three feet under the bottom of a hull. The eye saw nothing but a confused outburst of water, by reason of the persistence of images on the retina; but the photographic camera was very much quicker than the eye, as proved by the series of photographs, which showed the whole manner in which the hull yielded to the shock, the shape and position of the different fragments while flying up in the air and coming down again. All this was distinctly pictured in the series of photographs; still, from the time the torpedo was fired until the pieces had come down, only about two seconds elapsed, while in four and one-half seconds the water where the vessel floated was quiet again.

THE SIZE AND FIGURE OF THE EARTH.—Prof. Listing gives in the *Astronomische Nachrichten* the following results of his determination of the constants of the earth's figure: Equatorial radius, 6,377,377 meters; polar radius, 6,355,270 meters; mean radius, 6,377,000 meters; equatorial quadrant, 10,017,560 meters; meridian quadrant, 10,000,205 meters; eccentricity of meridian section, 288,480; length of second's pendulum at equator, 45°, and pole, 990.9948, 993.5721 and 996.1495 millimeters, respectively; force of gravity at equator, 45°, and pole, 9.780728, 9.806165 and 9.831603 meters, respectively; also in general the length of the second's pendulum equals (in millimeters) 990.9948 plus 5.1547 times the square of the sine of the latitude; and the force of gravity equals (in meters) 9.780728 plus 0.050875 times the square of the sine of the latitude.

NEW ELECTROTYPE PROCESS.—A new and ingenious process has lately been introduced into France, for electrotyping on non-conducting materials, such as china, porcelain, etc. Sulphur is dissolved in oil of lavender spike to a sirupy consistence; then chloride of gold or chloride of platinum is dissolved in sulphuric ether, and the two solutions mixed under a gentle heat. The compound is next evaporated until of the thickness of ordinary paint, in which condition it is applied with a brush to such portions of the china, glass or other fabric as it is desired to cover, according to the design or pattern, with the electro-metallic deposit. The objects are baked in the usual way before they are immersed in the bath.

Spontaneous Combustion by Zinc.

Dr. Hoffman has called attention to some curious cases of spontaneous ignition of hydrogen in air. The phenomenon has been noticed in factories where quantities of zinc were being dissolved in hydrochloride acid for the preparation of zinc chloride. Violent explosions took place when no flame was near; and it was eventually ascertained that the gas took fire spontaneously. It appears to be caused by fragments of very porous zinc, which, when lifted above the surface of the liquid during the violent evolution of the gas, and so brought in contact with hydrogen and air, act just as spongy platinum would do under the circumstances. The author recommends the performance of such operations in the open air. The ignition can be shown by treating a few kilogrammes of finely divided zinc with acid. The "zinc dust" may even ignite by contact with water.

A recent issue of the *Insurance Record* calls attention to the dangerous character of zinc dust, which appears to be imported into this country in considerable quantities for use in certain branches of industry.

The material presents the appearance of a gray powder, in an extremely fine state of division, in which condition it is largely used in the manufacture of paints. Chemically, it contains as much as 40% of metallic zinc dust, the remainder being oxide and carbonate. Another variety of the same commodity, known commercially as slate-colored zinc oxide, contains really very little or no oxide at all, being almost wholly a metallic dust, which, in the process of manufacturing zinc-white, has escaped combustion, and is deposited in the flues of the condensing apparatus. These products, the *Insurance Record* points out, are extremely apt to originate mysterious fires, if precautions are not taken to keep them from contact with moisture; for, owing to its very fine state of division, this metallic dust, in the presence of water moisture, will eagerly oxidize, and as this oxidation will be attended with a very considerable rise in temperature, the hydrogen gas evolved in the process may be inflamed, and, directly or indirectly, inflammable materials in the neighborhood may be ignited, and in this way the building or ship in which it happens to be stored may be destroyed, while the cause of the disaster may never be suspected. The *Record* points its moral by citing the case of the fire in the steamship *Lord Clyde*, in the year 1876, and which at the time attracted some attention. The facts in this case were about as follows: A number of casks of zinc dust were placed in the hold of the vessel, without any notice of the dangerous character of the material having been given to the owners of the ship. The casks, or some of them, by some means got wet, and within 12 hours after they had been put on board, the vessel was found to be on fire. When the source of the fire was discovered, the contents of one of the casks were found to be red-hot. As another contribution to the causation of what, for want of a better term, are called "spontaneous" fires, the facts above detailed are worthy of special attention.

Solidified Hydrogen or Hydrium.

The success which has been obtained in liquefying the gases thus far supposed to be permanent, it appears certain that not only liquefaction but also solidification has been achieved.

Pictet, in a very recent experiment with hydrogen compressed at 650 atmospheres, found, on opening the stop-cock, that the gas issued with a noise like that of a hot iron bar under water, and it had a steel-blue color. The jet suddenly became intermittent, and then there followed a sort of hail of the solid particles of hydrogen, which fell with violence on the ground and produced a crackling noise. Afterward the stop-cock was closed, and there was evidence that a crystallization of hydrogen took place within the tube; but when the temperature was again raised, the gas issued as a liquid.

M. Dumas, the President of the French Academy of Sciences, accepts these facts as full of confirmation of the theory, long ago advanced, that hydrogen is a gaseous metal. As water is an oxide of hydrogen, it follows from this that when a person drinks a glass of water, he imbibes a metallic oxide. *Nature*, in mentioning these performances, coupled with them another, which it regards as yet more remarkable from a scientific point of view. M. Pictet has been able to measure, with a very close approach to accuracy, the volume occupied by a given weight of oxygen in the liquid state; this was found to agree with the volume calculated for the solid or liquid gas, on theoretic considerations, by M. Dumas. By means of two Nicol prisms, M. Pictet observed the jet of liquid oxygen in polarized light, and found strong evidence of the presence of solid particles.

As in the chemical nomenclature the final ending "um" has been adopted for all metals, it is proper to call this metallic hydrogen, "Hydrium," a name which has already been used by the latest authors of German text-books of chemistry, even before hydrogen had been liquefied or solidified.

BEHM & WAGNER'S tables have lately been published, and show a total increase in the population of the earth of 15,000,000, partly arising from natural growth and partly from the showings of new and more exact censuses.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 6.		Week Ending Feb. 13.		Week Ending Feb. 20.		Week Ending Feb. 27.	
Alpha	18½	15	21	19	21	15¾	21	18½
Alta	8¼	7¾	8½	7⅝	7¾	7	6⅞	5½
Andes	50c	....	80c	50c	50c	65c	60c	50c
Alps	....	....	....	....	....	....	....	....
Argenta	65c	60c	70c	55c	65c	60c	1	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1½	1¼	1½	1	1	....	1¼	1
Belcher	6⅛	5⅞	8½	6½	8½	7½	7¼	6¼
Belmont	80c	70c	50c	45c	55c	50c	50c	40c
Best & Belcher	24¼	21½	26	24	25¼	24	24	24¼
Bullion	8½	7⅞	9	8¼	8⅝	7½	7⅞	6⅞
Bechtel	75c	....	80c	50c	70c	55c	75c	50c
Belle Isle	....	....	20c	....	30c	....	30c	....
Bodie	8	7⅞	8⅞	7½	7½	2¼	7⅞	6⅞
Benton	5⅞	5	6	5⅞	5⅞	5	5	4.40
Bulwer	15	14¼	18	16	18	16½	20	18
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	60c	65c	60c	1.05	65c	1.40	85c
Belvidere	55c	50c	45c	25c	1.40	80c	60c	40c
Booker	40c	20c	45c	40c	45c	55c	50c	40c
Caledonia	2.95	2½	3½	3	3.10	2.90	2⅞	2.55
California	9⅝	7⅝	8	7⅞	7⅞	7⅝	7⅞	5⅞
Challenge	4.30	2.95	5¼	4	3.95	3	3.70	3
Chollar-Potosi	49	46¼	49¾	48	49½	48	49	46
Comanche	....	....	....	....	....	....	....	....
Confidence	20	15½	23	17¾	17½	15½	16½	14
Con Imperial	1.20	1.05	1.35	1.20	1.35	1.05	1.30	1.15
Con Virginia	8⅞	7⅝	8	7½	7⅞	7¼	7½	5⅞
Crown Point	6¼	5½	6⅞	5⅞	6½	6	5⅞	4⅞
Con Washoe	....	....	....	....	....	....	....	....
Champion	....	....	....	....	....	....	10c	....
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	50c	....	50c	....	....	....
DeFrees	10c	....	15c	10c	10c	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	30c	20c	40c	30c	35c	30c	30c	....
Eureka Con	29	27	30⅞	29⅞	30	29⅞	29	27½
Exchequer	6½	5⅞	7¼	6⅞	7	6	7⅛	5⅛
Endowment	15c	10c	25c	10c	20	15	15c	5c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4½	4⅜	6	4.60	5⅞	5	5	4.60
Gila	....	....	5c	....	5c	....	30c	5c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	5½	5⅜	5½	....	13	5½	10	9
Goodshaw	35c	30c	45c	25c	50c	45c	50c	....
Gould & Curry	14½	12⅞	15¼	14½	14⅞	13⅞	13⅞	11⅞
Hale & Norcross	19	15⅞	21¼	18¼	18⅞	17	17½	15⅞
Hillside	2¼	2	2¼	2½	2¼	2	2.65	2.40
Highbridge	1.85	1⅜	1.40	1¼	1¼	1	80c	60c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	15c	10c	15c	10c	30c	25c
Independence	1.65	1¼	1.80	1½	2	1.80	1.80	1⅞
Julia	4.05	3½	4½	4¼	4.20	3.90	5⅞	5⅛
Justice	4	3.80	5⅞	4	5½	5¼	5½	4
Jackson	7¼	7	7	6½	7¼	6	7¼	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	7⅞	5⅞	8	6¼	6¼	5⅞	5⅞	4⅞
Kossuth	25c	20c	25c	10c	20c	15c	25c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.30	70c	2	1.20	1.90	1½	1.95	1⅞
Lady Wash	2	1½	2½	1.80	1.90	1.60	1.70	1⅞
Leopard	85c	15c	90c	85c	1	90c	85c	50c
Leviathan	75c	60c	75c	50c	65c	55c	65c	50c
Leeds	60c	....	80c	50c	80c	75c	1	60c
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	....	....	10c	....	....	....
Modoc	....	....	....	....	....	....	10c	5c
Manhattan	3.60	3¼	3¼	3	3	2½	2.90	2½
Martin White	5¼	5	6½	5½	5	....	6	5⅞
McClinton	60c	45c	60c	....	85c	40c	75c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	37½	36	40½	37½	40⅞	38½	47½	39½
Mides	....	....	....	....	....	....	....	....
Morning Star	3	....	3	2½	....	....	....	....
North Con Virginia	9¼	7	11½	8½	11½	9	14⅞	10
New York	1.10	70c	1.10	85c	85c	60c	65c	45c
Northern Belle	8	5⅞	8½	7⅞	10	9	10	8
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	20c	20c	....	25c	20c	20c	15c
Occidental	1	....	....	....	....	....	....	....
Ophir	34½	33½	42	34½	42	39¼	43½	40
Oriental	50c	35c	50c	40c	5c	....	20c	15c
Overman	10⅞	10¼	12	11⅞	12	11	10⅞	9½
Panther	10c	5c	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	30c	35c	25c	30c	25c	50c	40c
Prospect	5c	....	....	....	....	....	....	....
Raymond & Ely	6	6½	8	6	6½	6½	6¼	5
Richer	75c	....	60c	....	65c	....	1	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	1½	90c	....	....	....	....	....	....
Savage	15⅞	13¼	17	15½	15⅞	14	13⅞	13
Seg Belcher	....	....	24½	23	25	24	27	....
Sierra Nevada	48	46	49	40⅞	49	46½	57	47⅞
Silver Hill	2½	1.90	2.90	2½	2.70	2.40	2½	2
Silver King	10	....	19	....	9½	9¼	10	9¼
Silver Prize	....	....	....	....	....	....	10c	....
Succor	1¼	1.05	1¼	1	1	65c	60c	45c
Summit	2	1⅞	2½	1.95	2.65	2.15	3¼	2.30
Scorpion	1.80	1½	1⅞	1.60	1.60	1.40	1.70	1½
Solid Silver	70c	60c	70c	65c	60c	55c	60c	55c
South Bodie	25c	....	25c	....	30c	....	30c	....
South Standard	....	....	....	....	....	....	....	....
Star	65c	50c	95c	75c	75c	....	75c	70c
St. Louis	55c	50c	50c	....	....	....	50c	....
Syndicate	2	....	....	....	....	....	....	....
Tioga Con	1½	1¼	1.78	1½	1.70	1.40	1⅞	1¼
Tiptop	1⅞	85c	1.45	1	1¼	90c	1	90c
Trojan	45c	35c	45c	35c	35c	25c	30c	25c
Union Con	58⅞	57	62	61	68	61	90	67½
Utah	18⅞	17½	19½	17⅞	18	16	20	16¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	85c	70c	1.30	85c	1.40	1.20	2.05	1.35
Wells-Fargo	20c	15c	20c	15c	20c	15c	15c	....
Woodville	40c	25c	30c	....	....	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	25½	19½	27½	21⅞	22⅛	20½	22½	20

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 21.
475 Andes...55@60c
490 Alta...6⅞@6⅝
665 Alpha...19¾@20
400 Best & Belcher...23@22⅞
1315 Bullion...7⅞@7⅞
545 Belcher...7¼
155 Benton...5@4.90
640 Con Virginia...7¼
1230 California...7⅞@7¼
570 Crown Point...5⅞@5⅞
2255 Con Imperial...1¼@1.20
540 Caledonia...2⅞@2.90
200 Con Dorado...15c
120 Confidence...16½@16⅞
515 Challenge...3½@3.60
30 Chollar...48¼@49
930 Dardanelles...3.30@3¼
640 Exchequer...6⅞@6⅞
200 Flowery...35c
605 Gould & Curry...13⅞@13⅞
75 Geo Douglas...60c
485 Hale & Nor...16⅞@16⅞
250 Justice...5⅞@5¼
1595 Julia...5¼@5¼
140 Kentuck...5½@5⅞
830 Lady Bryan...1⅞@1.70
215 Leviathan...60c
375 Mexican...39¼@40
300 Mackey...3⅞@3.35
435 North Con Vir...10@10¼
490 N Bonanza...1.80@1.85
335 New York...65@60c
155 Overman...10½@10⅞
950 Ophir...40@40¼
3400 Phil Sheridan...40@45c
350 Sierra Nevada...47⅞@48
1480 Savage...13⅞@13¼
380 Silver Hill...2½
650 Solid Silver...55c
995 Succor...60@50c
50 Scorpion...1½
200 Trojan...30c
160 Utah...17@16¼
210 Union Con...67½@69
200 Wells-Fargo...15c
820 Ward...1.35@1.45
575 Yellow Jacket...21½@21¼

AFTERNOON SESSION.
1150 Argenta...95@90c
400 Albion...40c
50 Bechtel...60c
230 Bodie...7⅞@7¼
320 Belmont...50c
100 Belvidere...40@50c
430 Bulwer...18
650 Black Hawk...90@85c
300 Booker...40c
725 C Pacific...2@1.95
2400 Caledonia (B H)...2@1¼
550 Dudley...70c
100 DeFrees...10c
20 Day...30c
210 Eureka Con...29@28⅞
1250 Endowment...5@10c
600 Esmeralda...1
285 Goodshaw...50c
10 Grand Prize...5
1275 Gila...5c
300 Giant & O A...4¼
450 Hussey...25c
530 Hillside...2¼@2.65
700 Highbridge...80@75c
50 Independence...1.80
70 Jackson...7¼
100 Leopard...85@80c
125 M White...6
100 McClinton...70c
280 Mono...2@1.90
315 Manhattan...2.90
660 Northern Belle...8@8⅞
150 Navajo...20@15c
290 Oriental...15c
1250 Paradise...2½
60 Raymond & Ely...6
60 S Bodie...30c
125 Summit...2.30
570 S Bulwer...50@60c
100 Silver King...9½
100 Tiptop...95@90c
290 Tioga Con...1¼@1½

Monday A. M., Feb. 24.
580 Alta...6½@6⅞
1225 Alpha...20¼@21
400 Andes...55c
130 Best & Belcher...23⅞@24
1065 Belcher...7¼@6⅞
1770 Bullion...7⅜@7¼
470 Benton...5
200 Baltimore Con...1¼
85 Chollar...48¼@47
1140 California...7⅞@7¼
760 Con Virginia...7@6⅞
285 Crown Point...5½@5⅞
3600 Con Imperial...1.30@1¼
150 Challenge...3¼@3¼
450 Caledonia...2.90@2⅞
435 Confidence...16¼@16
250 Dardanelles...3.40@3½
1155 Exchequer...7¼@6⅞
400 Flowery...35c
200 Geo Douglas...50c
480 Gould & Curry...13⅞@13⅞
325 Hale & Nor...17½@17½
560 Justice...5½@4.90
1535 Julia...5⅞@6¼
95 Kentuck...5⅞@5⅞
1900 Lady Bryan...1.90@1.95
250 Leviathan...65c
620 Lady Wash...1½
2715 Mexican...46@47½
550 North Con Vir...14@14⅞
1340 N Bonanza...2.10@2
200 New York...60@65c
675 Ophir...43⅞@43
230 Overman...10⅞@9⅞
1600 Phil Sheridan...45@40c
150 Plutus...1.60
700 Solid Silver...60c
475 Savage...13⅞@13½
1545 Sierra Nevada...55@57
450 Silver Hill...2¼@2.35
35 Seg Belcher...27
850 Succor...60c
200 Scorpion...1½@1.60
250 Santiago...2½
400 St Louis...50c
250 Senator...25c
1300 Trojan...30c
195 Utah...20@19⅞
530 Union Con...87@90
800 Wells-Fargo...15c
2010 Ward...2.05@2
670 Yellow Jacket...22½@22¼

AFTERNOON SESSION.
140 Argenta...95c@1
350 Belmont...45@50c
700 Belle Isle...30c
245 Bodie...7½@7
350 Bechtel...60@55c
600 Booker...40@45c
200 Belvidere...60@50c
165 Bulwer...19@18⅞
50 Black Hawk...1.10
300 Con Pacific...1⅞@2
200 Day...30c
275 Dudley...60c
110 Eureka Con...28½
1250 Endowment...10c
1050 Esmeralda...1@1¼
1070 Grand Prize...5@4⅞
850 Gila...30c
100 Goodshaw...50c
200 Giant & O A...4.30
100 Hamburg...50c
150 Hillside...2¼
450 Highbridge...75c
220 Independence...1.60
195 Jackson...7¼@7
105 Leeds...1
70 Leopard...85c
40 Manhattan...2.60@2⅞
385 Mono...2@1.90
350 McClinton...75c
630 Modoc...5c
10 Martin White...5⅞
355 Northern Belle...9½@10
275 Navajo...20@15c
100 Oriental...15@20c
1510 Paradise...2¼@2
45 Real del Monte...3½
70 Ray'd & Ely...6¼
200 Star...75c
100 S Bodie...30c
1550 S Bulwer...1@1.15
1250 Summit...2.30@2½
70 Silver King...9¼
965 Tioga Con...1½@1⅞
300 Tiptop...1

Tuesday A. M., Feb. 25.
400 Alta...6¼@5⅞
150 Andes...55c
300 Baltimore Con...1
260 Best & Belcher...22@21½
1460 Belcher...6¼@6⅞
2305 Bullion...7⅞@7⅞
475 Benton...4⅞@4½
600 California...6¼@6⅞
275 Caledonia...2⅞@2.80
1300 Con Virginia...5⅞
1230 Con Imperial...1.20@1.15
75 Chollar...48@47
250 Crown Point...5½
30 Confidence...14½
355 Challenge...3.70@3.10
100 C Dorado...20c
800 Dardanelles...4@3⅞
1220 Exchequer...6⅞@6⅞
1400 Flowery...35@40c
400 Gould & Curry...13½@12⅞
195 H & Norcross...16⅞@16½
405 Justice...4⅞@4.95
965 Julia...5⅞@5½
120 Kentuck...5.15@5
1670 Lady Bryan...1⅞@1.70
200 Lady Wash...1.70
480 Leviathan...65@50c
805 Mexican...43½@44
520 Mackey...3½@3.40
200 Maryland...75c
100 New York...60@55c
870 North Con Vir...13⅞@12½
2060 N Bonanza...2@2.15
440 Ophir...42@41½
350 Overman...10@9⅞
300 Plutus...1.60
1550 Phil Sheridan...50@45c
205 Sierra Nevada...51@52
670 Savage...13@13½
770 Silver Hill...2.10@2
900 Succor...50c
160 Scorpion...1.70
350 Santiago...2.80
1705 Solid Silver...60c
450 Trojan...30c
95 Utah...17⅞@18½
415 Union Con...81½@80½
100 Wells-Fargo...15c
2500 Ward...1.80@1.90
625 Yellow Jacket...21

AFTERNOON SESSION.
25 Argenta...95c
800 Albion...40@45c
2000 Belle Isle...30c
315 Bodie...7
300 Bechtel...55@50c
190 Belvidere...60c
80 Bulwer...20@19½
355 Belmont...40@50c
560 Black Hawk...1@1.15
610 C Pacific...2
250 Caledonia (B H)...2
450 Day...30c
350 Dudley...60c
1400 Endowment...15@10c
180 Eureka Con...27½
1380 Esmeralda...1
100 Giant & O A...4.30
450 Goodshaw...50c
290 Grand Prize...4.60
250 Gila...30c
90 Golden Terra...9
600 Hussey...25c
770 Highbridge...70c
75 Hamburg...50c
650 Independence...1⅜
170 Jackson...7
500 Leopard...75c
445 Mono...2@1.95
150 McClinton...60@75c
100 Modoc...10c
270 Manhattan...2½@2.55
350 M White...6
275 Northern Belle...9¼@9
100 Navajo...20c
100 Oriental...15c
920 Paradise...2½@2.05
100 Real del Monte...4
35 Raymond & Ely...6
10 Real del Monte...3¼
200 Star...70c
700 S Bodie...30c
1385 Summit...2⅞@2.60
2850 S Bulwer...95c@1.10
20 Silver King...10
250 Silver Prize...10c
220 Tioga Con...1.60@1½

Wed'sday A. M., Feb. 26.
25 Andes...60c
210 Alpha...19½
535 Alta...5⅞@5½
425 B & Belcher...21½@20½
1580 Bullion...7¼@6⅞
650 Belcher...6⅞@6½
30 Benton...4.60
20 Chollar...47
1085 Con Virginia...5⅞
685 California...5¼@6
605 Crown Point...5¼@5
795 Caledonia...2½@2.60
2790 Con Imperial...1.15@1.20
80 Confidence...15@15¼
1385 Challenge...3@3.05
200 C Dorado...10@15c
380 Dardanelles...4@3.95
1065 Exchequer...6½@6¼
1020 Flowery...35@40c
100 Geo Douglas...40c
490 Gould & Curry...12¼@12½
390 Hale & Nor...16⅞@16⅞
230 Justice...4.70
720 Julia...5⅞@5⅞
50 Kentuck...5½
200 Leviathan...55@50c
1500 Lady Bryan...1.70@1⅞
250 Lady Wash...1½@1¼
2075 Mexican...42@44
100 Mackey...3.40
860 North Con Vir...13@13⅞
250 New York...50c
560 N Bonanza...2@1.90
135 Overman...9⅞@9⅞
275 Ophir...42@41½
250 Plutus...1.40
250 Phil Sheridan...45c
700 Succor...50c
550 Savage...13½@13½
400 Senator...25c
375 S Nevada...53@51½
1460 Solid Silver...60c
585 Silver Hill...2.10@2
300 Trojan...30c
45 Utah...17⅞@18
605 Union...79@81
200 Woodville...25c
100 Wells-Fargo...15c
2555 Ward...1.85@1.60
570 Yellow Jacket...20@20½

AFTERNOON SESSION.
50 Albion...50c
860 Argenta...90c@1.05
60 Bulwer...20
500 Bechtel...75c
195 Bodie...6⅞@6⅞
750 Belvidere...50@60c
550 Black Hawk...1.10@1.40
200 Belmont...40c
800 Belle Isle...30c
1450 Booker...50@45c
100 Champion...10c
475 Caledonia (B H)...2@2.10
1140 C Pacific...2@2.10
550 Dudley...60c
80 DeFrees...10c
150 Day...30c
270 Eureka Con...28
200 Endowment...15c
1900 Esmeralda...1@1.20
1000 Fourth July...35@40c
135 Grand Prize...4.65@4.60
160 Goodshaw...50c
105 Golden Terra...9@10
100 Giant & O A...4.60
300 Gila...30c
1460 Highbridge...60@65c
850 Hussey...30@25c
75 Hillside...2.40
1115 Independence...1⅞
60 Jackson...7
310 Leopard...65@50c
200 Leeds...75@60c
160 McClinton...75c
430 Manhattan...2½
40 M White...6
100 Minnietta Bell...30c
120 Mono...2@2¼
150 Northern Belle...9¼@9
1500 Navajo...15c
660 Paradise...2⅞@2.20
155 Raymond & Ely...5½@5
200 Richer...1
100 S Bodie...30c
240 Star...75c
1215 Summit...2⅞@3¼
1955 S Bulwer...1@1.10
125 Tiptop...90c
1030 Tioga Con...1½@1⅞
1300 Tuscarora...10@5c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Feb. 20.
190 Alta...7
145 Alpha...20
50 Andes...60c
95 Best & Belcher...24½@24¼
2060 Bullion...8@7⅞
150 Belcher...7⅞
345 Benton...5½@5
390 Caledonia...2.95@2.90
3210 Con Imperial...1.30@1.20
300 C Dorado...20c
90 California...7⅞
170 Challenge...3⅞@3.70
490 Con Virginia...7⅞@7⅞
105 Confidence...17½@16⅞
230 Crown Point...6⅛@6
550 Dardanelles...3.20
810 Exchequer...7@6⅞
250 Flowery...40@35c
200 Gould & Curry...14½
425 Geo Douglas...60c
270 Hale & Nor...17⅞@17⅞
310 Justice...5½@5⅞
1280 Julia...4@3.95
35 Kentuck...5⅞
100 Kossuth...20c
25 Lady Wash...1.60
620 L Bryan...1⅞@1.70
200 Leviathan...60c
150 Mexican...40⅞@40½
100 Mackey...3¼
600 New York...60@65c
180 N Con Virginia...10⅞@10⅞
750 N Bonanza...1.80
180 Ophir...41½@41
310 Overman...11⅞@11
1935 Phil Sheridan...30@25c
300 Plutus...1.60
100 Sierra Nevada...48¼@48
675 Savage...14⅞@14⅞
485 Silver Hill...2.60@2.55
920 Succor...70@65c
610 Solid Silver...55c
950 Trojan...35@25c
70 Utah...16@17⅞
205 Union Con...67½
750 Wells-Fargo...15c
900 Ward...1.40@1.35
1260 Yellow Jacket...22½@22

AFTERNOON SESSION.
1030 Argenta...60@65c
200 Albion...40c
465 Belmont...40@50c
100 Belvidere...70c
80 Bodie...7⅞@7½
100 Bulwer...17⅞
650 Black Hawk...90c@1
405 Bechtel...60c
1200 Belle Isle...30c
150 Booker...40c
465 C Pacific...2
485 Caledonia (B H)...1⅞@2
500 Dudley...65@75c
445 Day...30@35c
200 DeFrees...10c
1050 Endowment...15c
50 Eureka Con...28⅞@29
1500 Fourth July...30@35c
30 Grand Prize...5
570 Goodshaw...50c
200 Giant & O A...4.10
50 Golden Terra...8½
370 Hussey...25c
700 Highbridge...90c@1
50 Hillside...2⅞
20 Jackson...7½
25 Leeds...75c
150 Leopard...80c
5 Martin White...8½
70 Mono...1.95@2
200 Manhattan...3
150 Minnietta Bell...25c
875 McClinton...75@80c
320 Northern Belle...8½@8⅞
900 Navajo...20c
100 Oriental...10c
625 Paradise...2½@2.65
20 Raymond & Ely...6
100 Real del Monte...3½
320 Summit...2⅞@2.30
330 Star...65@75c
50 Silver King...9½
50 S Bodie...30c
200 S Bulwer...50c
75 Tiptop...1
510 Tioga Con...1.40@1½
100 Tuscarora...5c

Thursd'y A. M., Feb. 27.
255 Alta...5½
100 Andes...50c
210 Alpha...18½
190 Best & Belcher...20⅞
900 Belcher...6⅞@6¼
2130 Bullion...6⅞@6⅞
1060 Benton...4½@4.40
515 California...6¼@6⅞
550 Con Virginia...6⅞@6¼
285 Crown Point...5@4⅞
30 Chollar...46
2790 Con Imperial...1.15
245 Confidence...14
1455 Caledonia...2.60@2.55
355 Challenge...3@3.10
1185 Dardenelles...3@3.05
1885 Exchequer...5⅞@5⅛
1020 Flowery...40@35c
155 Gould & Curry...12½@11⅞
405 Hale & Nor...15⅞@15¼
390 Justice...4¼@4
900 Julia...5½
95 Kentuck...5@4⅞
100 Kossuth...25c
185 Lady Wash...1¼
1005 Lady Bryan...1.70@1.60
1050 Leviathan...50@60c
480 Mexican...44½@44
60 Mackey...3½
890 New York...50@45c
485 North Con Vir...13@12⅞
755 N Bonanza...1⅞@1.90
100 Ophir...41@40⅞
550 Overman...9⅞@9⅞
1475 Phil Sheridan...45@40c
100 Plutus...1.30
305 Sierra Nevada...50¼@50
585 Savage...13¼@13½
1000 Succor...45c
595 Silver Hill...2
530 Scorpion...1.55@1.60
1330 Solid Silver...60c
300 Santiago...2½
450 Trojan...30@25c
175 Union Con...80@79½
10 Utah...17½
1150 Ward...1.60@1½
1050 Yellow Jacket...19⅞@19½

AFTERNOON SESSION.
1150 Argenta...1@1.10
300 Albion...50@75c
300 Belle Isle...25@30c
25 Bulwer...19½@19⅞
490 Bodie...6@6½
300 Bechtel...65@[illegible]c
100 Belmont...40c
300 Belvidere...70@75c
2675 Black Hawk...2@2½
300 Booker...70@75c
350 C Pacific...2.10@2.15
100 Caledonia (B H)...2½
150 Chieftain...15c
250 Concordia...10c
100 Dudley...70c
100 DeFrees...10c
300 Endowment...10c
1150 Esmeralda...1@1.22
400 Goodshaw...45@50c
190 Grand Prize...4.70@5
400 Golden Terra...10
100 Giant & O A...[illegible]
300 Hussey...20@25c
20 Hamburg...60c
100 Highbridge...60c
50 Hillside...2.30@2.40
50 Independence...1⅞
55 Jackson...7½@7½
520 Leopard...55@60c
40 Martin White...6
360 Mono...3
245 Manhattan...2½
700 McClinton...70@75c
50 Minnietta Bell...30c
24 Modoc...5c
240 Northern Belle...9¼
100 Oriental...15c
350 Paradise...2.15@2.20
230 Richer...1
25 Silver King...9½
532 S Bulwer...1@1.10
290 S Bodie...30c
200 Star...60c
1590 Summit...3@3¼
400 Tuscarora...10c
470 Tioga Con...1.70@1⅞
145 Tiptop...90c
50 University...75c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery s
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3	20	Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Justice M Co	California	27	1 00	Jan 10	Feb 15	Mar 5	R E Kelly	419 California st
K K Consolidated	Nevada	7	1 00	Jan 3	Feb 6	Mar 5	B B Minor	310 Pine st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
Maybelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Mono G M Co	Bodie	2	50	Jan 8	Feb 12	Mar 4	W H Lent	309 Montgomery st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 23	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Mar 30	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 9	Wm A Van VanBokkelen	309 Cal
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 17	Apr 2	J T McGeoghegan	316 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	476 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N C Walton	324 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
MariposaLand & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	1	25	Nov 22	Feb 10	Mar 6	A C McMeans	Safe Deposit Build
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Mar 24	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
Vancouver M Co	Nevada	2	16	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	Mar 1	April 5	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ætna M Co	Arizona	J S Benear	420 Montgomery st	Annual	Mar 24
Centras Con M Co		W W Parrish	328 Montgomery st	Annual	Mar 11
Northern King M & M Co	Arizona	J F Glover	318 Pine st	Special	Mar 13
Hale & Norcross S M Co	Nevada	J F Lightner	N W cor Pine & Montg'y	Annual	Mar 12
Pioneer Con M Co		J M Buffington	309 California st	Special	March 5
Slavonia G & S M Co	Nevada	A F Martin	525 Front st	Annual	Mar 11
South Utah M Co	Nevada	Chas S Healy	Merchants' Ex	Special	Mar 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Feb 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Independence M Co	Nevada	R H Brown	327 Pine st	25	Nov 20
New York Hill G M Co		F J Herrmann	418 Kearny st	25	Oct 24
Silver King M Co	Arizona	W H Boothe	320 California st	50	Oct 22
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Feb 12

Pacific Board—Latest Sales.

Wed'sday A.M., Feb. 26.
20 Alpha...19½
40 Alta...5⅞
210 Belcher...6½@6.40
90 Best & Belcher...20⅞
20 Bullion...7
190 Con Virginia...5⅞@5.90
150 Con Imperial...1.20
20 Chollar...46
105 Crown Point...5½@5
150 California...5⅞@6
100 Caledonia...2.60
10 Challenge...3.15
510 Exchequer...6@6.15
200 Gould & Curry...12½
120 Hale & Nor...16¼@16⅞
50 Justice...4⅞
270 Julia...5⅞@5.65
100 Kentuck...5¼
155 Mexican...44@43½
100 New York...55c
140 Ophir...40⅞@40½
25 Overman...10@9⅞
100 Savage...13½
35 Sierra Nevada...51½
100 Silver Hill...2
35 Utah...17⅞@18
40 Union Con...60
80 Yellow Jacket...20½@20¼

AFTERNOON SESSION.
200 Argenta...1
50 Alta...5⅞
50 Andes...50c
30 Bullion...6⅞@6⅞
85 Best & Belcher...20⅞@20½
520 Con Imperial...1.15
160 Con Virginia...6⅞@6½
10 California...6⅞
50 Crown Point...5
50 Dardanelles...3½
50 Dayton...50c
130 Exchequer...5.95@6
1000 Globe...4c
150 Hussey...25c
50 Hale & Nor...16
20 Justice...4⅞
60 Julia...5½@5.55
50 L Bryan...1.70
200 Mariposa...3⅞@4
50 Mackey...3⅞
60 Mexican...44@42½
100 New York...53c
20 Overman...9½
1900 S Utah...16@14c
700 S Bulwer...1
110 Silver Hill...2.05
1000 Tuscarora...10c
350 Ward...1.60@1.65
1400 Wells-Fargo...16@15c

California Board—Latest Sales.

Wed'sday A.M., Feb. 26.
4000 Atlanta...1c
40 Alpha...18½
60 Alta...5⅞@5⅞
875 Ætna...25@27c
40 Best & Belcher...20⅞@20¼
60 Belcher...6½@6¼
30 Bullion...7
30 California...5⅞
30 Con Virginia...5⅞
350 Con Imperial...1.15@1.17
40 Crown Point...5
30 Chollar...47
35 Challenge...3
130 Caledonia...2.70
500 Crevice...20c
50 Dardanelles...3⅞
40 Exchequer...6¼
100 Favorite...65c
800 Globe...3c
30 Hale & Norcross...15½
35 Justice...4.90
45 Julia...5½
50 Mexican...42½
200 Mint...18c
500 Monumental...4c
10 North Con Vir...11⅞
30 Ophir...41
100 Oriental...5c
100 Phil Sheridan...46c
2500 S Utah...13@15c
40 Savage...12⅞
150 Silver Hill...2
30 Sierra Nevada...51
1000 U Flag...1c
20 Union...77
30 Yellow Jacket...19

AFTERNOON SESSION.
50 Alpha...19¼@19½
50 Alta...5⅞@5⅞
200 Ætna...25c
100 Argenta...2.85
3000 Atlanta...1c
100 Atlas...12½c
40 Bullion...7⅛
40 Best & Belcher...21
20 Belcher...6⅞
20 Con Virginia...6
40 Crown Point...5⅛
300 Con Imperial...1.15@1.17½
70 California...6⅛@6
40 Chollar...46½
300 Coso Con...5c
80 Caledonia...2.65@2.60
200 Enterprise...1@1½
40 Exchequer...6⅛
100 Endowment...10c
260 Fairfax...1½@1.20
30 Gould & Curry...12⅞
100 G Deposit...87½c
1500 Globe...4c
200 Gila...30@25c
40 Hale & Nor...16½
30 Julia...5⅞
20 Justice...4.80
30 Mexican...45½
200 M Monterey...37½c
1130 Newark...35@25c
30 Ophir...41
400 Phil Sheridan...45@44c
35 Savage...13⅞
30 Sierra Nevada...51⅞
250 Santiago...2⅞
2500 S Utah...14c
300 Tiger...1
500 Twin Peaks...4c
20 Union Con...81
1100 U Flag...1c
200 Woodville...25c
200 Wales...1
30 Yellow Jacket...20⅞

Mining Share Market.

We have had a dull and uninteresting week in stocks. With one or two exceptions, the market has been entirely destitute of animation. The transactions on the Boards show how suspicious small dealers are, that the various deals have reached their culminating point. They touch tenderly, letting go on the first appearance of weakness. Shares are too well concentrated for insiders to dispose of them immediately. The only thing to be relied on for a general redistribution, is the probable development of an ore body. What movements have been perceptible, have been discouragingly sluggish, the animation resulting rather from the policy of inside manipulators, than an outside demand for shares. The principal deal has been in Unioa Con., which rose about $30 at the middle of the week, only to fall again, toward the latter part, to nearly its old level. Why the spurt took place is somewhat of a mystery. There were no developments to warrant the jump, and we can only explain it on the theory that it was a test of the "gambling" feelings of the community, to see how far they would respond to an opening of the market. Evidently, the response was not wholly satisfactory. Reaction was almost immediate, and stocks took an inexplicable fall, as sudden as their rise. The break not only wiped out all the appreciation, but, through sympathy, brought down seriously many stocks which had not participated in the rise. The bonanza shares were principally affected. Toward the close of the week, efforts were made to arrest and liven the market, and the old rule was put in practice, of selecting and supporting one particular favorite, as a prop to the others, and thereby to restore the wavering confidence of the people. Mexican was the one selected, and some little excitement was raised. Most stocks rallied. There was a slight rise in the Tuscarora. Summit advanced sharply, while Bodie and Raymond & Ely slightly declined. No other important changes in ontside stocks. The Comstock remained steady, but with orders limited. The market generally closing steadily.

Irrigation in Nevada.

The Wiuaemucca *Silver State* of Jan. 22nd, says that the "Humboldt Irrigation and Development Company" has been formed, composed of Sacramento business men, for the purpose of diverting the Humboldt river for irrigatiou and agricultural purposes, and to bring the barren wastes into market. To this end, a dam at Oreana, 12 miles from Lovelock's, has been constructed at a cost of $15,000. This brings the water to within one foot of the top of the soil at the head of our valley. The construction of the ditch or canal, with sufficient capacity to divert nearly all the waters of the Humboldt, is being rapidly pushed at this time, and when completed will be nearly 20 miles long. Also a smaller ditch meandering under the foothills, which, when it reaches opposite Lovelock station, will afford as fine a waterfall as can be found in the State—a fall of 40 feet—which will afford ample water for flouring and quartz mills, and not detract from the main object—that of irrigation. This ditch and dam, when completed, will cost in the neighborhood of $100,000, and will give us a front rank as an agricultural community. We are also on the great highway of natioas—the Central Pacific railroad, which spans the whole valley, and with proper facilities for freight, we can at all times ship aay and all surplus we have on hand; also, affording abundance of feed for fattening stock for the California market.

New Incorporations.

Diamond Creek G. & S. M. Co.—Diamond Mountain District, Nevada. Capital, $5,000,000. Directors—Albert C. Shaw, J. C. Cable, Jacob Weissbein, William Word and Joha Warner.

Representative G. & S. M. Co.—Capital stock, $10,000,000. Directors—E. J. Baldwin, J. P. Cavallier, Alex McAbee, R. E. Kelly and J. J. Maue.

De Ruyter G. M. Co.—California. Capital stock, $500,000. Directors—T. A. Talbert, Thos. W. Cuaningham, John Day, J. W. Roherts and A. D. Rightmire.

The Cozian, the Witch, and the Haley and Militich G. & S. M. Co.—Baranoff Islands, Alaska. Each has a capital of $1,000,000, and the Trustees of each are as follows: S. B. Watson, Walter Hoge, Robert Kanzie, E. Chielovich and L. Radovich.

Pacific Coast Oil Co.—To deal in oils and oil lands. Capital stock, $1,000,000. Directors—Charles N. Felton, L. D. Fisk, George Loomis, George W. Heges and E. H. Forester.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Tybo Con., Feh. 17th, $4,089.90; Ophir, Feh. 22d, $79,230.38; Hillside, Feb. 24th, $5,470.00; Independence, Feh. 24th, $6,000.00; Grand Prize, Feb. 24th, $14,500.00; Paradise Valley, Feb. 21st, $29,300.00; Christy, Feb. 24th, $5,902.00; Tyho Con., Feh. 19th, $4,274.77; Northern Belle, Feh. 22d, $9,136.74; Paradiso Valley, Feh. 24th, $3,400.00; Highhridge, Feb. 25th, $4,250.00; Martin White, Feb. 23d, $6,960.00; Hillside, Feb. 26th, $5,530.00.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Phœnix. *Dispatch*, Feb. 22: The deepest point reached is 1,250 feet, and the lowest level at 1,200 feet; both developing finely. Nearly the whole of the ore now taken out comes from between the 1000 and 1100 levels. There is plenty of water in the ditch for all purposes. Besides timbers, from 20 to 30 cords of wood are floated through the ditch daily. Eight cords per day are consumed by the furnace, the surplus being stored for summer use, to tide the works over that portion of the year when wood-floating is impractical. At the head a boom has been constructed across the middle fork of the river, not for the purpose of stopping the logs entirely, but to guide them into the ditch. Besides supplying water for their own works, the company run 600 inches to Michigan bar, $75 to Irish hill, and 200 to Forest Home.

Amador Con.—The sluking of a new shaft has been commenced on the old Wolverine ground, which has not yet been explored to any extent. A strong force of men are employed in sinking operations and in tearing down the buildings over the Eureka shaft, which are to be erected over the mouth of the new opening. This move is looked upon as insuring the working of the mine for many years.

The Centennial.—This mine and mill are under attachment from several parties. The ore looks splendid, but does not contain much gold. Repeated assessments have discouraged many of the stockholders, or exhausted their purses, consequently the last assessment is unpaid to a great extent. Between 2,000 and 3,000 shares were bought in by the company. Still, work is proceeding in the mine. Miners are running a drift west, in the hope of striking a richer body of ore, which, from surface croppings, is believed to exist in that direction. The mill has been shut down for some time.

Notes.—At Ophta, S. H. Clarke has a five-stamp mill operating on goldta, by using cement. The cement cannot be worked by hydraulic power. It has to be blasted from the mine, and is put through the mill like quartz, the five stamps crushing some 40 tons per day. A clean-up was made the other day, with highly satisfactory results. The Pennsylvania, at New Chicago, is still idle, and no immediate prospect of resumption of work. The miners who were engaged by the company at the time of the cave have tired of waiting for it to start up, and scattered in search of employment elsewhere. The English company owning the Original Amador have purchased the Maryland mine for $12,000. This property adjoins the Seaton, lately purchased by the same company. Few men are at work at present, but as soon as spring fairly opens a strong force will be put on. A crushing of rock from the St. Louis mine, on Kennedy flat, is to be made soon at the Oneida mill.

CALAVERAS.

Gwin Mine.—*Chronicle*, Feb. 22: Considerable trouble has been experienced by the breaking of pump-rods There is a good deal of water in the mine, and notwithstanding the pumps have been increased in size they have to be run beyond a safe rate of speed to keep it down. Aside from that everything is progressing favorably, the batteries being at present supplied from the 1400 level.

Struck It.—An enormously rich quartz vein has been discovered near the North Fork of the Mokelumne, in the West Point district, by a gentleman from Mexico. We have no particulars of this find beyond the announcement that the ledge is wide and the rock very rich.

Upper Country Mines.—The shaft of the Champion is now down 500 feet and a station is being put in at that depth. Drifting to strike and crosscut the ledge is also commenced. Some parties have commenced taking ore from the San Bruno at Mosquito. Operations at the San Pedro, Glencoe district, continue to be conducted with great zeal, and rapid progress is being made in sinking the new shaft. At the Banner, same district, everything is running smoothly, the work of extracting rich ore going steadily on.

INYO.

Benton.—Inyo *Independent*, Feb. 15: The Comanche company have resumed operations again. Our letter, under date of 12th instant, says: "The mill started on tailings on the 5th, and is working at a good profit; will ship a number of bars next week. The hoisting works of the Kerrick mine have been removed to the Tower, the entire change being accomplished and the machinery set in motion again in five working days, exclusive of two days on the teams.

Struck It.—The old Fish Springs gold ledges, some 18 miles north of town, have been re-opened and prospected by the lessees, Olmstead & Davis. They have been successful in finding the lost ledge in the old workings, with plenty of ore running from $75 to $150 per ton in gold. Mr. Westerville is setting about to repair the old arastras.

Running.—The Brown Monster mill has been running 30 stamps steadily for some time, and partial clean-ups so far indicate complete success.

MONO.

Standard.—Bodie *Standard*, Feb. 22: The east crosscut from the main shaft is in 273 feet; progress for the week, 28 feet. The rock in the face is in porphyry, with stringers of quartz. The south drift from this crosscut has been advanced 18 feet, total length, 207 feet. The ledge is three feet wide, of very good ore. The east crosscut, 300 level, old shaft, is in 225 feet; progress for the week, 10 feet. No change in the character of the ground. The north drift from the crosscut has been extended during the week 14 feet; total length, 66 feet. The ledge is two and one-half feet wide, and looks well. The north drift on the West Standard is in 70 feet. The ledge is 18 inches wide, of very rich ore. The south drift on this ledge is in 69 feet, showing a ledge two feet wide, which is also very rich. The north drift on the Cook ledge is in 130 feet. The ledge is 18 inches wide, and looks well. The tramway has not been running for two or three days. The cable is worn out, and a new one is expected from Pillston, Pa. Two cables have now been worn out. The first lasted eight months, and the last but three months. The new one will be a three-quarter-inch steel wire affair, while its predecessor was but five-eighths. For the present the ore is being hauled by teams.

Red Cloud Con.—The west crosscut, 400 level, is now in 50 feet. The rock in the face is becoming harder. A progress of a few feet has been made in the east crosscut, same level, without material change. On the 250 level fair progress has been made on the west crosscut from the north drift. A winze has been started on the Packard and Morton vein, which is now down 10 feet. The mine has been cleared of water since the strike, and everything is working well.

Belcher.—The south drift, 380 level, is in from the winze 165 feet; progress during tho week, 10 feet. The ledge is two and one-half feet wide, and looks well. The west crosscut from this drift is seven feet. The rock is very hard. The ledge in the upraise is two feet wide, of good ore. The ledge in the south drift, 200 level, is three feet wide, and looks well. No important change in the Stonewall stopes, which are yielding the usual amount of good ore.

Maryland Con.—Work is going on with more than usual activity. The ledge is keeping its usual width, with an increase of quartz, both in quality and quantity.

Queen Bee.—The mine has resumed work after the strike, with the usual number of miners. Drifting has commenced north, and a fine lot of ore being taken out, which is saved for milling. The east crosscut, 250 level, is being continued, and is now in 38 feet. The west crosscut has been discontinued for the present and the force placed at work on the ledge.

Mono.—Work has not been discontinued in this mine during the strike. The north drift, 400 level, is in 45 feet from the shaft. The ground works well. The west crosscut from the north drift, at a point 18 feet from the shaft, is in 25 feet. It has passed through some hard rock and streaks of mineral-bearing quartz.

University.—Since last report the 100 level has attained a total length of 184 feet; 15 feet progress during the week The crosscut from the bottom of the shaft is in 22 feet, cutting through nine feet of ledge matter, four feet of which is quartz; prospecting well.

Harrington.—The tunnel has been advanced 15 feet during the past week On the 12th inst. a ledge was cut consisting of a heavy character of clay and two feet of quartz. Being near the surface it is considerably broken. The hanging walf has not been reached yet, as in driving ahead alternative veins of quartz and porphyry are cut.

Goodshaw.—The east crosscut, 450 level, was advanced nine feet during the week, and the west crosscut six feet. Work was suspended during the strike, which fact has caused a less progress than usual. The full complement of men is now being worked in the bottom, and everything is running as formerly.

South Bodie.—Work was resumed this morning Sinking will be continued with all possible speed until the depth of 500 feet is reached. When ordered to quit work in the shaft by the Mechanics' Union, several small veins of quartz were running in the bottom, assaying $21.

Summit.—The station at the depth of 200 feet has not yet been completed, and the skip runs are not yet in, owing to the delay of several days during the week, occasioned by the strike. Sinking and drifting will be commenced as soon as this work is completed.

NEVADA.

Hydraulic Mines.—*Union*, Feb. 25: Mr. Thomas, on the "Slide," has secured from the V flume, a good head of water, and is running with 400 inches, using one giant, and piping until ten o'clock at night; in a few days will commence running night and day as long as there is sufficient water. The bank is about 60 feet in hight, composed of soil, pipe clay, containing seams of gravel, and a fine blue gravel layer next to the bed rock. The bed-rock is generally a soft blue slate, which picks easily, and slackens by expose to the atmosphere. When this bed-rock is washed clean of gravel the fine gold can be seen sprinkled over it quite liberally. Mr. Thomas holds a large piece of this ground to the north of town, secured by U. S. patent, and has lately increased its area by the purchase of the ground that belonged to the Dartmouth company.

Watt Gravel Mine.—This has been drifted 26 feet in the east drift this week; there is not any change in the appearance of the drift since last report; everything is running as usual.

Alaska Mine.—The hoisting works over the new shaft are completed, and the raising of ore commenced. No. 1 level is opened several hundred feet, and from this part of the mine the best paying rock has always been taken. The Alaska-Bullion combination shaft is down 55 feet below the No. 3 level, and showing a strong ledge all the way. A new contract has been let to sink the shaft 30 feet deeper, and upon the completion of this contract a new level will be turned. The No. 3 level is in a good quality of milling ore, and is producing sufficient to keep eight stamps going. The ground on this level works easily, and rapid progress is made in extending the drifts.

The Pittsburg Mine.—*Transcript*, Feb. 29: The mine presents favorably. The ledge in the 600 north drift is well defined, carrying a large amount of sulphurets, and free gold being visible. The ore in the 700 north stopes is looking well. The 800 north stopes are yielding good ore. The ledge in the 800 south stopes is also doing and yielding fairly. Owing to the late storms the water in the mine has very materially increased. The pumps are doing fairly and will, no doubt, be able to keep the mine free from water.

PLACER.

Dutch Flat Hydraulic Mines.—*Herald*, Feb. 22: The hydraulic claims at Dutch Flat have commenced running for the season. The Polar Star and Southern Cross are in full operation. The water is taken from the South Yuba ditch. Between 40 and 50 men are employed. The wages are $35 per month and board, or $2.10 per day without board. A new Superintendent has taken the place of Mr. P. Colgrove. Mr. Samuel Colgrove. Mr. Samuel Harriman is the sub-Superintendent. Mr. Robert Simmons is the foreman of the Polar Star, and Mr. Charles Hilton, of the Southern Cross. The Frauklin, now owned by a company of capitalists of San Francisco, has also commenced work under the management of Mr. James Taaffe. This claim also uses water from the South Yuba ditch. Mr. Lecamp's claim has also commenced running. Some half a dozen men are employed. The wages of the men are $3 per day without board. The Central has also started up for the present mining season. The other claims of the Cedar Creek company are not working, on account of law matters, not yet adjudicated. The Jehosaphat claim is worked out, but the Baker claim paid well during the last mining season. There is a rumor afloat that the Englisb Co. have sold out.

SHASTA.

Copper City.—Reading *Independent*, Feb. 24: Everything is all right with the Extra company, which was reported failed. The present indebtedness will be paid in full, and instead of checks, cash will be paid hereafter. Mr. Crane has everything in good shape to produce bullion. The mill is in good running order, the tramway is completed, and a rich vein of ore has been discovered, and the creditors will all help him out. The mill will still be run, and that on a cash basis, and bullion will continue to be produced in even greater quantity than heretofore. That the mine is rich, there can be no doubt, as the shipment of over $100,000 in bullion within a period of six months will testify, and if the bullion is there, this temporary suspension cannot affect it.

Items.—A quartz mill is at the depot for the Mad Ox mine, near Whiskytown, owned by Messrs. Hull, Biekford, Orotefend and Stroud. Thus the Afterthought mill will be ready for business about the 1st of April.

SIERRA.

Savage Placer.—Downieville *Messenger*, Feb. 22: Work is going ahead on the tunnel of the Savage Placer Co. There is now two feet of snow at Downieville and it is much deeper at the mine. Supt. Mooney telegraphs that he has not heard from the mine for eight days. He made several attempts to go to it but was unable to get through. He has sent a man up on snow shoes. All is no doubt going on as usual at the tunnel, as the men have an abundanee of provisions and supplies of all kinds and are well and comfortably housed. At the works there are buildings with a long shed leading to the dump from the mouth of the tunnel.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—Gold Hill *News*, Feb. 20: The work of sinking the incline is making all the progress possible with present facilities. It is 38 feet below the 2300 level. The face continues in cap rock. The north drift, 2200 level, is still in soft, treacherous ground which needs to be well timbered. The heat also interferes with rapid progress. The face is, however, 300 feet from the north crosscut, and in good working ground. The east shaft will reach the 2200 level this week. A sump will then be sunk and after that a drift will be started south to meet the one going north. Good progress is being made in pushing the upraise from the 1700 level up to meet the shaft of the North Con. Virginia.

Gould & Curry.—Crosscut No. 1 east, 1900 level, on the Best & Belcher line, has been started and is in 25 feet in hard porphyry. Crosscut No. 3 east, same level, has passed through a mixture of hard clay and porphyry, and is now in hard porphyry. Crosscut No. 4 west is in vein matter consisting of quartz and porphyry. No work is being done in Nos. 2 and 4 crosscuts east.

Utah.—The new hoisting engines are now ready for use, but the cable for the incline has not yet arrived. The incline has been carried down in good ground 328 feet below the 1350 level.

Lady Bryan.—The shaft is being continued on down through bird's-eye porphyry and quartz; the drifts north and south on the 600 level are also in vein material giving low assays, and the west drift on the 380 level is in quartz and porphyry.

Best & Belcher.—West crosscut No. 3, 1900 level, has penetrated a lively looking vein formation 111 feet, and continues in the same material.

Ophir.—Everything going on again as usual. The break of last Wednesday has been repaired and sinking resumed in the main incline, which continues to penetrate porphyry.

Mexican.—The joint Union Con. winze from the 1600 level is being sunk and timbered at the rate of three feet per day, and is now 253 feet, on the slope, below the level. The material continues to be hard blasting porphyry.

Justice.—The drift from the Alta to connect with the bottom of the winze below the 1300 level is making good headway through a kindly formation of vein matter containing narrow veins of rich ore.

Leviathan.—The repairs to the main shaft are completed and work going ahead lively in the lateral drifts, both north and south, on the 750 level.

California.—The upper levels of the mine are yielding their usual amount of ore, and show no changes worthy of note.

Chollar-Combination Shaft.—Fair progress is being made in sinking, notwithstanding the abundant flow of water, which is slightly on the increase, coming in from the southwest corner. This is hoisted to the surface by the skeets. The water raised by the pumps is all discharged into the Sutro tunnel.

Savage.—Last Thursday all prospecting work was stopped in the mine. The last work done was in the south lateral drift on the 2100 level and from the winze. This had reached at that time a distance of 313 feet. The pumps are holding the water 40 feet below the 2000 level.

Belcher.—Sinking the main incline, which was resumed last Thursday, is making excellent progress, the face being 75 feet below the 2560 station. The south drifts on the 2560 and 2300 levels are also being rapidly pushed forward through good working ground.

Silver Hill.—The main incline continues to encounter hard black rock, making progress slow. The east crosscut, 1100 level, is making rapid headway in a dry formation of porphyry and clay.

Julia Con.—The pumps are running well and the balling tanks are also in use. These appliances together are holding the water down. Preparations to turn this water into the Sutro tunnel will be completed Thursday night and the whole of it will be raised to the 1600 by a Cameron pump and discharged through the connection as soon as word is received from Mr. Sutro authorizing it, in accordance with the contract.

Con. Virginia.—The joint Best & Belcher crosscut west, on the 1950 level, and joint winze, are receiving the usual attention, the former being in quartz and porphyry and the latter in hard porphyry. The C. & C. shaft is being pushed on down as rapidly as the hardness of the rock and the large amount of water will permit.

Ward.—The new machinery will be ready for operation by the 15th of next month. The east crosscut, 800 level, is in 458 feet, the face in bird's-eye porphyry with stringers of quartz. This is being pushed to prospect the vein underlying the croppings to the east, which it is expected to reach when in 800 feet.

North Con. Virginia.—The large water tank below the 1600 level is in place and all completed except calking. It is 18 feet long and 9x8 in the clear. The large and convenient blacksmith shop to the east of the works is finished and in use.

Overman.—The work of sinking the O. & C. shaft is suspended to-day to put in the new steel skeet, but will be resumed again this evening and will thereafter make five feet per day.

Bullion.—The Combination Bullion-Exchequer drift on the 2400 level is cutting soft vein porphyry containing stringers of quartz and making good progress.

Hale & Norcross.—Very little is being done in the mine except pumping. The water is held 32 feet below 2000 level. The winze from the east drift on this level is down 44 feet.

Con. Imperial.—A survey is being made for the purpose of running a drift south from the station on the 2600 level of the old workings of the Yellow Jacket.

Alta.—The principal work on hand at the present time is that of placing the new double engine at the head of the joint Alta-Benton winze from the 1550 level.

Union Con.—The north drift, 1450 level, connecting with Sierra Nevada, is still being repaired. From the 1600 level the joint Mexican winze is averaging three feet per day, and is now 253 feet in depth, the bottom still in hard blasting porphyry. The flow of water from the east drift continues to decrease.

Yellow Jacket.—The new shaft has been sunk 10 feet below the 2280 level, and a pump station is being chambered out. When this thing is completed sinking will be resumed. Surveys are being made for connections between the 2600 level of the Imperial and the 2400 level of the old works.

Crown Point.—The usual repairs to the incline, etc., are going on. The drift north on the 2500 level and from the bottom of the winze is still skirting the vein and cutting a kindly formation of soft rock which admits of excellent progress. The drift is now in 112 feet.

Solid Silver.—The retimbering of the main tunnel in the caved ground at the north end is steadily progressing, and it is being enlarged for a side track in order to take out ore when the main ore chimney shall be reached and re-opened.

Caledonia.—Drifting east on the 1600 level in hard vein porphyry and making good progress. The vertical winze to the 1900 level is in a soft, friable formation of vein porphyry and is being sunk with all possible dispatch.

Succor.—Sinking the shaft and drifting both north and south on the 1050 level. The formation encountered in both these drifts continues promising.

New York.—Sinking the incline below the 1040 level, as usual, and making good progress.

EUREKA DISTRICT.

The Hamburg.—*Sentinel*, Feb. 25: Mining operations for the past week have progressed as usual. An upraise of 23 feet at the north end of Intermediate drift below 250 level has been made. The 400 level, west crosscut, advanced 15 feet, making a total of 135 feet from the south drift. South drift from west crosscut advanced 15 feet, making a total length of 71 feet; face in favorable vein matter, showing some buches of good ore. The winze was sunk 13 feet, making a total depth below the 600 level of 50 feet, with a considerable showing of iron in the bottom.

Charter Tunnel.—The suspension of this company is but temporary, and they are preparing for active operations. Three specimens of ore from the Tunnel were assayed by Walter Brooks during the week, yielding, respectively, $4.70, $15.71 and $661.33. The company is still confident that ore, in paying quantities, will soon be reached. A small amount of their stock will be placed on the market for the purpose of raising funds to prosecute the work The stock is unassessable, and will undoubtedly prove a good investment.

Connolly Mine.—The prospects of this company's property are very flattering, and extensive operations are being carried on. The principal mining is now being done on the 500 level, where they have a broast of ore eight feet wide and of high grade.

Eureka Con.—The Eureka Con. have completed their shaft from the 12th to 13th level, and are now drifting north for the mine. The upper levels continue to look well, and are furnishing the usual amount of ore. The furnaces are running nicely and making a large quantity of bullion.

The Jackson.—The Jackson mine never looked more promising. They are daily shipping to the Motamoras furnace about 45 tons of ore, which averages $70 per ton. From the present indications of the mine the stock ought to be worth double its selling price.

The Metamoras.—The Metamoras furnace is running

[Continued on page 140.]

Geodetic Instruments of Precision at the Paris Exposition and in European Workshops.

[Read before the California Academy of Sciences, Feb. 17th, 1879, by PROF. GEORGE DAVIDSON.]

It is a fact familiar to those who have occasion to make use of instrumental contrivances, that novel methods are constantly being devised to meet new requirements or to lessen existing defects. As the delicacy and importance of any given work is increased, the observer soon discovers sources of error that had not been suspected, and finds errors that were veiled by the disposition of the relative parts of the instruments. Instruments of the higher class are too frequently at fault, but the ingenious observer is soon led to investigate the sources of trouble, and either to obviate them or to seek for the best instruments suited to his particular and peculiar duties. In the broadest view of the case we must not be confined to individuals or to nationalities, but aim only to obtain the highest mechanical design and workmanship. In the progress of the geodetic work of the United States, stretching from the Pacific to the Atlantic, and also northward and southward along the Pacific coast, there was furnished to me, among other instruments, one theodolite, of large size, which was subjected to the most rigid scrutiny to determine the flexure of the pillar plate, of the microscope arms, and of the telescope; also, the character of the graduation of the 20-inch circle, and various other points involving accuracy. Under ordinary circumstances the instrument would have passed muster for lines of moderate extent, but when lines of 160 miles in length were involved, it was essential to the integrity of the undertaking, that errors of even a second of arc should be avoided. At the distance of 160 miles one second of arc subtends four feet: a skilled observer can measure a much less quantity than one second, and certainly the instrument should afford the means of his measuring what he can see.

Fully alive to the importance of the subject, the Superintendent of the U. S. Coast Survey had determined that there should be made a careful examination and study of the instruments of precision, exhibited at the Paris exhibition for geodetic and astronomical work, topography and hydrography, for the telegraphic determination of longitude, etc. And, moreover, that the examination should be extended to the first-class workshops of Europe, where instruments of this character are manufactured.

It was desired to ascertain, if practical, whether the productions of European manufacturers were superior to our own; wherein lay any superiority, if found to exist; and in what consisted the peculiar merit of the work of any particular manufacturer.

As a mechanician seeking merely the trade secrets of the makers, I could not have expected to enter into any sanctum sanctorum; but upon a candid explanation of my purpose and instructions, I found nearly every workshop opened to me, and full and free explanations made to my inquiries. It would therefore be unjust to these manufacturers to severely criticise in public the character or even the minor defects of their instruments, or to make known the methods of their processes. These I received for the benefit of the Government, and whenever I mention any names here, it will be to commend their work; although many are officially commended that are not now referred to.

In previous experiments upon the larger and finer instruments, I have discovered errors of graduation and flexure of parts much greater than I had any reason to suspect; and I believe much greater and more serious than the makers had thought possible. This latter is the more readily understood when we reflect how few mechanicians are actually observers; and that it really requires long practice for the most skilled observer combined with fair mechanical instincts to discover and measure the minute and conflicting errors which are resultants of different infinitesimal, and perhaps unsuspected causes. As a rule, the observer makes his measures upon objects subject to many extraneous and disturbing causes, and whenever unsatisfactory results are obtained, he is very apt to attribute them to the unfavorable conditions of the atmosphere or to his own condition and temperament at the time; generally overlooking the fact that the instrument maker was quite as liable as himself to errors of judgment in the proportions and workmanship of the instrument used.

Setting aside for the present the peculiar adaptness and fitness of the observer for his business, we are necessarily interested in the requirements of geodetic operations and especially in the duties of the instruments by which these are satisfied. In all geodetic work, portability, accuracy and maintenance of instrumental adjustment are essential to rapidity of progress, to economy of expenditure in money and in personnel, and to precision in the results. Experience and theory teach us that in any given instrument, such as a theodolite for geodetic purposes, we need simplicity of design; fewness of pieces; harmony in the proportion of parts; accuracy of workmanship; superior graduation with adequate microscope micrometers; micrometer screws free from mechanical defects; commensurate optical conditions of penetration and power; sensitive and trustworthy levels; and the highest precision in all the bearings of the moving parts. Moreover, the general disposition of the parts should be such as to offer the greatest facilities to the observer, in order that he may make the necessary observations without fatigue or nervous strain.

Guided by these general considerations, I examined the fine collection of geodetic instruments exhibited by the Minister of War, many of the exhibits of private exposants, and some of the workshops of the manufacturers in Paris. After this I visited the principal manufactories of Geneva, Neuchatel, Munich, Vienna, Dresden, Berlin, Hamburg, Cassel, London and York. At the exposition I did not have the fullest facilities afforded me, and not only was I unable to get into one of the principal cases, but I was positively forbidden to continue my drawings; whilst one well known maker would not only not permit me to make any tests of the graduation of his theodolite, but would not allow me see his graduating engine. Outside of Paris I was permitted to see every graduating engine of the noted manufacturers, and afforded facilities for the examinations of their productions. But on account of the commercial depression which was overshadowing all business in Europe, as well as the United States, the number of the larger instruments on hand was very few. In some workshops I found that not over 20 per cent of the usual number of workmen was employed.

Besides the mechanical construction of the instruments, I was particularly anxious to study the capacities of the different graduating engines, in order to judge, in a measure, of the probable value of the results. The graduating engine is simply a mechanical tool with which we should expect to divide a circle of say 20 inches in diameter in 360 parts, with no greater an error than the 1-50,000 part of an inch or 4-10 of a second of arc in any one degree. The probable error of an experienced observer in reading the five minute graduations of such an instrument is about 1-10 of a second of arc, or the 1-200,000 of an inch. It is usually assumed that the graduation errors are not over one second of arc, and this is what the majority of instrument makers suppose or assert to be their average error in each degree graduation; but I am perfectly satisfied that even this limit of accuracy is rarely if ever reached. As a matter of fact I failed to learn from any manufacturer that he had ever tested a theodolite after graduation by measuring every five minute space on the circle, or even every degree; whereas in my previous testings of a 20-inch theodolite I had detected differences of 15 seconds between whole degrees, and errors of 5, 6 and 7 seconds in contiguous five minute spaces.

You can readily understand the almost multitudinous sources of error against perfecting a graduating engine; and the most skilled mechanicians find that it requires persistent labor and experiment for two, three or more years to approximately effect their purpose. Yet until we get a reliable graduation it is futile to seek for final accuracy in our measures; nevertheless all other sources of error should be reduced to minima, and the perfection of graduation persistently attempted. After a graduating machine has been made as nearly perfect as the means and skill of the mechanician can effect it, be carefully measures the different degrees, tabulates the errors, and generally constructs an error circle whose circumference is irregular in a certain proportion to the errors determined. This circumference is so connected with the tangent screw moving the graduate circle as to advance or retard the screw the exact amount of the error at any given point. This is one way of effecting the necessary correction, and is mentioned merely to serve as an illustration; yet in this method it must be evident that the retarding of a screw brings into operation any backlash that may exist even if it be almost practically infinitesimal.

Among the instrument makers I found the most positive and opposite views of practice; for instance, one believes wholly in automatic moving parts in the graduating engine, and makes every effort to secure uniformity of temperature, etc.; another scouts the automatic movement and does everything by hand, with or without much attention to change of temperature; one party believes in a steel cutting tool; another pins his faith upon his diamond cutter, etc. Many of the observers implicitly receive the dicta of the instrument makers, and but few make any exhaustive examinations for themselves. Among the tests which had been made by the Chief of the Prussian Geodetic Survey, between theodolites of a few of the best makers, there was a very close agreement in the probable error of the systematic errors, but the probable error of the irregular errors was only half as great for the Wauschaff circles as for the others. Without here mentioning the names, I may state that from the character of the instruments examined, I recommended the Superintendent of the Coast Survey to have circles graduated by five of the best makers, and test them as I had tested the 20-inch theodolite referred to. For where mechanical skill is good and apparently nearly equal, it would be vain to attempt to decide by simple inspection or upon a maker's reputation, although upon these merits alone awards were made at the exposition.

After the instrument maker has effected the division of the graduating circle into degrees, the sub-division into 2-minute, 4-minute, 5-minute, or 10-minute spaces is sometimes made by verniers suitably divided, but frequently the coincidence of the lines of the vernier and the circle is determined by bringing the ends of the lines together, and judging by the eye whether one is truly a prolongation of the other. The Reposolds certainly appreciated this source of error and had in a great measure successfully overcome it. Some of the graduating engines examined had been made and in use from thirty even to fifty years; now considering the great advance in the construction of instruments of precision in that time, it is hardly too much to ask that this special mechanical tool should be perfected. Of course there are more recent efforts but not yet notably perfected. It offers to our younger skilled mechanicians a very delicate problem upon which to try their ingenuity, skill and patience; with such a tool superior to those of their competitors, they may be assured of a fair income from its work alone, and an enviable reputation.

Of the larger theodolites which I had an opportunity of examining, the best was by Brunner. It combined fewness and simplicity of parts, and fair harmony of proportion, yet I should certainly doubt the adequacy of its optical power for long lines; it reads by four verniers instead of three, involving more labor, and less reading points on the circle; whilst the observer must be placed in a constrained position because the horizontal plane of the telescope is only about two inches above the reading microscopes. Moreover, the circle (instead of the whole instrument,) is changed for new positions and clamped by three screws in each position. Should the surface planes of contact be warped, this clamping would warp the circle in each new position and thereby introduce error. This method was devised about 20 years since, and soon abandoned; it is now the fashion.

In the evident desire to obtain compactness and simplicity, the instrument is not adapted to the observing of azimuths by means of a close circumpolar star, because the telescope cannot be elevated. Instead, the transit instrument must replace the theodolite for that purpose, whereby the possibility of error is introduced in occupying the identical station; and even if this be granted, the labor is increased and extra time consumed.

Fashions prevail among instrument makers and observers just as we find a change of opinion upon the question of refractors and reflectors. At one time it seemed as if the prismatic telescope was to carry everything before it, and I find many manufacturers and observers yet strongly in favor of that form. It certainly has the decided advantage of comfort to the observer; but from personal experience, and from conferring with such observers as Plantamour, it seems that the system necessarily involves "flexure" or deformation of the prism, notwithstanding the numerous and ingenious efforts made to secure it properly in position. Of course some manufacturers insist that their special methods of securing the prisms are infallible; but the observer is the final judge of their failures. In the highest character of work I should certainly not use them; whilst for the secondary works it seems hardly necessary to increase the number and intricacy of the parts.

A prevailing fashion at present is to introduce reversing apparatus and counterpoises, even in theodolites with circles of eight inches in diameter. This is as complete a wandering from simplicity as can well be imagined, and must certainly lead to grave errors. It is well known that by moving a telescope in altitude by means of the usual slow-motion screw, the tendency is to raise the transit axis pivots, but as the weight of the telescope is too great to be lifted clear of the Y's, the pivot is moved up one side of the sloping Y, and the telescope thereby changed in azimuth. Now, if the weight of the telescope be counterpoised by springs, the pivot is lifted still higher and the resulting change in azimuth becomes greater. Not only that, but the intricacy of the adjustment thereby introduced, conflicts very much with the hearings of the vertical axis. I saw no form of reversing, that should be applied to any first class theodolite, or to any theodolite which might be used at a distance from the workshop of a skilled mechanic. The same amount of labor otherwise expended upon the same instrument, would largely increase its value for honest work. This form, as well as the prism telescope, must however be demanded by observers or the makers would hardly continue their manufacture.

Another fashion that seems to prevail is the use of microscope micrometers upon small theodolites of eight inches diameter, and even in some cases of only six inches. These microscope micrometers read the circle to one or to two seconds; but in every such case the telescopic power and the transit axis level were vastly inferior to such delicacy, and therefore the contradiction existed that the instrument maker expected the observer to measure what he could not see. In fact, I think it may be safely asserted as a rule that the telescopic power of all the instruments examined was inferior to the other parts.

And still another fashion is in the use of the universal or Altazimuth instrument. The combination of two or more instruments for different purposes into one instrument for all the required purposes is difficult and doubtful even in machines of industry; but when every new piece and movement introduces a fresh source of error into a delicate instrument where the constant study should be really to decrease them, the combination must be clearly shown not only to possess freedom from additional errors, but to give better results or as good results as two different and separate instruments at less cost of construction, less weight for transportation and mounting, and greater rapidity of manipulation. For certain classes of work, the universal instrument has, without doubt, some decided advantages; but for such work as is demanded in the primary and main triangulation of the United States they are essentially unsuited. Nor would our surveys willingly adopt the eccentrically placed telescopes of the theodolites used in the Prussian Geodetic Survey, although the character of that work stands very high; if any series of observation is broken it cannot be utilized without extra calculation; and a loss of time means a loss of money. The multiplicity of parts in some of the instruments on exhibition was astonishing. I was attracted by the complication of an instrument having a circle of about eight inches diameter, and although I could see little more than one side of the instrument I counted no less than 93 screws of all kinds, whilst others seemed evolved and contrived from the inner consciousness of some closet professor.

In one large combination instrument in the exhibition, there were, among other curious features, two small lamps for illuminating the horizontal circle under the three microscopes; one for the telescope, and one for reading the level and the two microscopes for the vertical circle, together with a multiplicity of mirrors to reflect the lights. No matter howsoever small the heat of the flames might be, here was the introduction of sources of error that would tend to complicate and mask the other defects of the instrument.

I had the opportunity of studying many of the recent and varied forms of portable transit instruments. Some there were that never should have been permitted to leave a workshop; others aiming at great stability by the use of very heavy cast-iron stands, yet introducing an element of error in having their adjustments for level and azimuth at the base. This seems very much like erecting a great solid building upon a movable foundation. It is granted that in the usual form of movable Y's for the adjustment of the transit axis level and of azimuth, two fertile sources of error exist, but many years since I readily and successfully overcame the difficulty by tightly clamping either movable Y after the last mechanical correction has been made to the adjustments. Troughton and Simms have in part since used a similar application. The frames of the later Coast Survey transit instruments are emphatically portable from their form and weight of metal; their telescopes have generally greater light-collecting power than the portable transits examined, whilst the character of the results is fully established by the rigorous method of discussing them. By the adoption of four foot-screws I have secured remarkable firmness; whilst the double frame gives not only great facilities for preliminary adjustments in the meridian, but enables the transit to be used for a latitude instrument by the Talcot method. Some of the portable transits in Europe hardly bear out that character, and would not be adopted in the mountains where our geodetic work is being carried; it was very evident that cast-iron was cheap, transportation easy, and time no object. And I found severer criticisms than mine passed upon particular instruments (designed for great surveys) by some whose opinions have much weight in the geodetic world; whilst one well known observer confessed, that were he to design a new instrument it would not have the form of that which he had planned, constructed and already used.

Although I made few efforts to examine the manufacture of lenses for telescopes and microscopes, those which I did see were generally of superior character. I was very much impressed with the thorough skill and knowledge of Shroeder, of Hamburg, who was making the lenses for the 15-inch equatorial of the new Potsdam observatory. An examination of some of his smaller instruments revealed marvelous precision of figure, whilst his means of testing the curvature of the lens was beyond anything I had seen or known. The computations for the curvatures of the lenses are very elaborate and exhaustive.

Without going into details of telegraphic longitude apparatus, electrical clocks and chronometers, etc., I may mention that I examined the base apparatus of Brunner, being constructed for the Spanish Geodetic Survey; and had the greatest pleasure in examining the original base apparatus of Bessel in the Prussian geodetic office. The Brunner apparatus aims at the simplicity of the Borda thermometer, and is therefore composed of two four-meter bars of different metals, having largely different coefficients of expansion. The lower bar is platinum; immediately above it is the brass bar of the same cross section. At one extremity of the compound, or rather composite bar, the two bars are joined, but are free towards the other extremity. At the free ends the upper bar has a slot in it that receives a piece soldered to the lower bar, whereby the upper surface of this piece is flush with the upper surface of the brass bar. Upon one is cut a series of graduated lines; upon the other a vernier. When the bars expand or contract through increase or decrease of temperature they do so unequally, and the difference of that change is read and is determined by the scale and vernier.

The base bars of Bessel are four in number, and each composite bar is formed of two bars of different metals of different rates of expansion for equal increments of heat. In this case the lower bar is iron and the upper is zinc. One end of each system is formed by the junction of the two bars, and thence the bars are free. Instead of a scale upon one and a vernier upon the other, the zinc bar terminates close to a small projection upon the upper surface of the iron bar, and the difference of expansion was measured by the insertion of long graduated wedges of glass in the space between the end of the zinc bar and the iron stud.

Either of these forms of apparatus has great merit in the extreme simplicity of the form and fewness of parts, and it appears to me that with thorough skill in the observer, accuracy of comparison with the given standard bar, simplicity and stability of the supports, and the proper means of effecting the contacts, the method is susceptible of great accuracy. But I was very far from being satisfied with the character of the

supports and the methods and appliances of measurement. These, however, I discuss fully in my official report to the Superintendent of the Coast Survey.

Without detaining the attention of the Academy any longer, I may mention, in brief, the general conclusion to which I arrived. While I saw much of deep interest, there was no single instrument that I would unreservedly recommend for adoption in its entirety. What I principally learned was really *what not to copy*. And whilst awarding high credit to the instrument makers of Europe, and keenly alive to their courtesy, I am convinced that we do not need to go to Europe for geodetic instruments, although we should possess copies of their finest efforts for comparison with our own. With our own observers and mechanicians working in harmony and striving to attain the highest excellence, I firmly believe that we are fully competent to lead in this scientific effort. Both parties fully appreciate the fundamental requisites to success, and the character of the geodetic work of the United States demands that the mechanical means shall be adequate to the delicate manipulation and requirements of the most skillful observers.

The Cone-bearers, or Evergreen Trees of California.—No. 6.

[Written for the PRESS by J. G. LEMMON.]

Juniper. Yew. Nutmeg and Joint-Stem.

Tribe III. (Last tribe of the first great order of *Pinaceæ*), improperly called "red cedar" at the East. *Junipereæ*, Juniper family. A large and distinct family of very slow growing trees, forming but one genus in all the world. Fruit a consolidated cone or closed berry, called, scientifically, a *galbulus*, not opening at maturity; leaves acicular (needle-shaped) or scale-like, opposite or in whorls of threes, closely imbricated; pith of the limbs very eccentric, *i. e.*, the limbs take on material from one side.

Only genus *Juniperus*, from *juvenus*, a child, and *pario*, to prevent; the berries from time immemorial have been used to procure abortion; two species and one marked variety of another species in California.

1. *Juniperus occidentalis*, Hook. "Western juniper," a decrepit tree, sparsely found on the eastern slopes of the Sierra, generally only a few feet high, however large at base, but in Oregon forming trees of the largest size and of symmetrical proportions. Berries small, bluish black, pulpy, very resinous; leaves in threes, or often in pairs.

2. *Juniperus Californica*, Carriere. "California juniper." A stout, many-branched shrub, or occasionally a small tree 16 to 20 feet high, sparsely found from Mount Diablo southward, on dry mountain slopes. Berries larger, one-half inch long, reddish-glaucous, sweetish, used by southern Indians for food; leaves nearly always in threes.

3. *Juniperus Sabina*, L, variety, *procumbens*, Pursh, "Rock juniper"—"Creeping juniper." A prostrate, creeping shrub, carpeting dry rocky ridges in certain few localities in the Sierra; berries small, resinous; leaves in pairs of two sorts; on sterile plants, acerose, one-half inch long; on fertile ones, simple, oppressed scales. This genus ends the great order of *Pinaceæ*, comprising the most of our conifers. The three other orders, being only sparsely represented here, one of them not at all, will require but little space for description.

Order II.—Taxaceæ. Yew Family.

A small order of slow-growing, heavy-scented trees, chiefly found in northern Europe and Asia. Fruit with cone characters nearly obliterated, more or less drupe-like, resembling a plum, containing but one seed, naked above; leaves two-ranked, lanceolate, acute. All parts of the tree exhaling a disagreeable odor. Two genera, each with one species, in California. First genus *Taxus*, Gr. *taxon*, a bow, anciently used in archery. "Yew Tree." Fruit shaped like an acorn cup, becoming a pulpy dish, holding a small upright seed.

Taxus brevifolia, Nutt. "California yew." A small tree of limited localities in the Sierra, becoming larger in the Cascade mountains of Oregon, Fruit very small, one-quarter inch across, viscid, edible; leaves dark green, on short foot-stalks; timber hard and heavy. The twigs of this yew are supposed to be poisonous to stock; will some reader having knowledge of the trees please report?

False Nutmeg Tree.

Second genus *Torreya*. A commemorative genus, dedicated to John Torrey, the most distinguished of American botanists. Fruit, a large closed berry, resembling a nutmeg. This is a small genus of only four known species, but, curiously enough, they are scattered at nearly equal distances around the northern hemisphere, and found always in company with a solitary species of *Taxodiæ*, the latter either living or fossil.

Torreya Californica, Torr. "California nutmeg," A beautiful tree, 40 to 60 feet high, found accompanying the redwood of the coast and the big tree of the Sierra. Fruit, rugose, wrinkled, one to one and a half inches long, resembling a nutmeg, but having none of its qualities; leaves two to three inches long, dark green, decurrent and very sharp pointed.

Order III.—Gnetaceæ, Joint-Stem Family.

A very small order of shrubby plants, excluded from the *coniferæ* by most writers and having scarcely any outward resemblance to the rest of the class of gymnosperms, being jointed like the horse-tail or scouring rush, and often with net-veined leaves, both characters connecting this class with the endogens below it, but its naked seeds in a scaly cone, and its resinous juice, compel its classification with the *gymnosperms*. Shrubby, desert-loving plants, mostly confined to the arid plains of Asia. One genus of two species in the Great Basin, and barely reaching the limits of our State.

The generic name *Ephedra* is the Latin for horse-tail, the common scouring rush.

1. *Ephedra antisyphilitica* ——? "Washoe joint-stem." Found on the eastern foothills of the Sierra. Young stems slender, straw-colored, in fascicles of more than three; cones ovate, nine-half inch long; leaves few, small, papery.

2. *Ephedra trifurca*, ——? "Colorado joint-stem." A similar bush of the Mohave and Colorado desert, but with stems, leaves and cones always in whorls of threes.

This species concludes the description of all the gymnosperms indigenous to California, no representative of the curious fourth order, *Cycadaceæ*, is found growing north of the tropics, except in greenhouses.

Readers familiar with the Eastern forests and with the scientific names of the trees, will notice the absence of all the conifers of that region, some of them so distributed and adapting themselves to such different circumstances that you think they might grow here. Other readers may be misled because we call some of our trees, colloquially, by the same names as others of the East. They are very distinct, however. It is resemblance, not identity of species. And here recurs the often-enjoined lesson, that scientific names are the only ones that really distinguish. The vernacular of all countries is limited, crude and conflicting. We have not an identical species of the nine Eastern pines—White, Broom, Loblolly, Pitch, Yellow, Southern, Jersey, Red and Scrub. Not one of their six spruces and firs—Hemlock, White, Black and Norway spruce, and Fir and Double Balsam. Neither of their tamaracks (nor any other *true* ones). We have not the same species of arbor vitæ, cypress, redwood, juniper, yew, nor nutmeg.

Ours is a peculiar climate and soil, and their productions correspond, and in nothing more strikingly and beautifully, than in our mountain forests of cone-bearers.

And now if I have aided my California readers in better questioning and knowing the trees of our noble forests, I am satisfied with the travel, research, study, time, labor and stationery it has cost.

[Concluded.]

Useful Information.

Hints for House-Cleaners.

We give below a few hints which may prove useful to housekeepers:

Soot falling on the carpet from open chimneys, or from carelessly handled stove pipes, if covered thickly with salt, can be brushed up without damage to the carpet.

A little spirits of turpentine added to the water with which floors are washed, will prevent the ravages of moths.

When carpets are well cleaned, sprinkle with salt and fold when laid, strew with slightly moistened bran before sweeping; this, with the salt, will freshen them wonderfully.

Fuller's earth, mixed to a stiff paste with cold water, spread on the carpet, and covered with brown paper, will, in a day or two, remove grease spots; a second application may be necessary.

Spirits of ammonia, diluted with water, if applied with a sponge or flannel cloth to discolored spots in carpets or garments, will often restore the color.

A paste made of whiting and benzine will clean marble, and one made of whiting and chloride of soda, spread and left to dry (in the sun if possible) on the marble, will remove spots.

Paint, splashed upon window-glass, can be easily removed by a hot solution of soda.

Use kerosene and brick-bath or lime, to scour zinc, tin or copper; wash in hot suds, and polish with dry whiting.

To give glass great brilliancy, wash with a damp sponge dipped in spirits, then dust with powdered blue or whiting, tied in a thin muslin bag, and polish with chamois cloth.

A flannel cloth dipped in warm soapsuds, then into whiting, and applied to paint, will instantly remove all grease and dirt. Wash with clean water, then dry; the most delicate paint will not be injured, and will look like new.

One pound of copperas dissolved in one quart of boiling water will destroy foul smells.

Powdered borax scattered in their haunts will disperse cockroaches.

Plaster of Paris mixed with gum arabic water makes an excellent white cement, but must be used immediately, as it hardens quickly. A mixture of five parts gelatine to one of acid chromate of lime, applied to broken edges, which should be pressed together and exposed to the sunlight, makes an insoluble cement.

To whiten walls, scrape off all old whitewash, and wash the walls with a solution of two ounces of white vitriol to four gallons of water. Soak a quarter of a pound of white glue in water for 12 hours; drain and place in a tin pail, cover with fresh water, and set the pail in a kettle of boiling water. When melted, stir into the glue eight pounds of whiting, and water enough to make a mixture as thick as common whitewash. Apply evenly with a good brush; if the walls are very yellow, blue the water slightly by squeezing in it a flannel bag containing some powdered blue.

To clean matting, wash with a solution of one pint of salt to four gallons of water, and wipe dry immediately.

To clean oilcloths, wash always with warm milk. Once in six months scrub with hot soapsuds, dry thoroughly, and apply a coat of varnish. They will last as long again.

A little kerosene added to stove-polish improves the luster. Apply while the iron is warm.

To remove spots from furniture take four ounces of vinegar, two of sweet oil, and one of turpentine; mix and apply with a flannel cloth.

Gum camphor wrapped in paper and laid around sugar barrels will disperse ants.

COLORING METALS.—A foreign paper gives the following: Metals may be rapidly colored by covering their surface with a thin layer of sulphuric acid. According to the thickness of the layer and the duration of its action there may be obtained tints of gold, copper, carmine, chestnut brown, clear aniline blue, and reddish white. These tints are all brilliant, and if care be taken to scour the metallic objects before treating them with the acid, the coloring will suffer nothing from the polishing. On making a solution of 640 grains of lead acetate in 3,450 grains of water and warming the mixture to 88° or 90°, it decomposes and gives a precipitate of sulphuret of lead in black flakes. If a metallic object be immersed in the bath, the precipitate is deposited upon it, and the color produced will depend on the thickness of the deposit. Care must be taken to warm the objects to be treated gradually, so that the coloration may be uniform. Iron treated in this way has the aspect of bluish steel; zinc, on the contrary, becomes brown. On using an equal quantity of sulphuric acid instead of lead acetate, and warming a little more than in the first case, common bronze may be colored of a magnificent red or green, which is very durable. Very beautiful imitations of marble may be obtained by covering the bronze objects warmed up to 100°, with a solution of lead thickened with gum tragacanth, and afterwards submitting them to the action of the precipitate spoken of above.

IMPORTANCE OF COOL-GRINDING OF FLOUR.—Mitcherlich and Crocker have shown that wheat in which sugar was proved to be absent before sending it to the mill, yielded, after being ground, four per cent. of it. Starch was thus transformed into sugar, which could not be done otherwise than through the internal action of the gluten aided by superabundant moisture. The mutual action of the gluten and the natural moisture of the flour seem often capable, at common temperatures, of slowly bringing about this injurious change. But when the flour comes out hot from the stones and is left to cool gradually in large heaps, decomposition quickly sets in, starch is changed to sugar, and (when kept warm long enough) the sugar into alcohol, while if the temperature is continued long enough above 60° Fahr., it advances rapidly to the souring stage. These facts form a strong argument in favor of cool grinding.

POISONOUS COLORS.—According to the *Chemical Review*, energetic steps are being taken in Switzerland against the use of poisonous colors. The Governing Council of Zurich has prohibited the use of all coloring matters prepared from the compounds of the metals lead, arsenic, copper, chrome, zinc, antimony, bismuth and mercury, for decorating articles of consumption or of clothing, or their materials; also paper for wrapping up chocolate, coffee, tea, chiccory, tobacco and eatables in general; toys, covers and cushions of children's carriages, carpets, curtains and window blinds, lamp screens, wafers, and table services. Poisonous organic matters, such as gamboge, picric acid, the aniline colors, especially magenta, are not to be used for coloring articles of food or drink, such as confectionery, jams, syrups, wines, etc. The same rule applies to the phenol colors. Imported articles containing such poisons may not be sold.

IMMENSE PHOTOGRAPHS.—At a recent meeting of the Berlin Association for the Promotion of Photography there were exhibited some remarkable photographic pictures taken by Herr Holtermann, of Sydney, Australia, and which, in point of size, probably far exceed anything thus far accomplished in the art. They were mounted on an endless band of paper, strengthened by linen, and were nearly 100 feet in length. Among them were two colossal panoramas of the cities of Sydney and Melbourne, each made up of about a dozen sheets, and very skillfully joined together, the separate pieces harmonizing perfectly in tone and depth. One picture of the list, and which had obviously been printed from a single negative, was about five by three feet in size.

TO CHILL CAST IRON VERY HARD.—Use a liquid made as follows: Soft water, 10 gallons; salt, one peck; oil vitriol, one-half pint; saltpeter, one-half pound; prussiate of potash, one-quarter pound; cyanide of potash, one-half pound. Heat the iron a cherry-red and dip as usual, and if wanted harder, repeat the process.

Good Health.

Some Hints in Regard to Diet.

In Dr. Hall's *Journal of Health*, a few years ago, the following statement of the amount of nutriment in various articles of food was given:

"Raw apples, 10%; boiled beans, 87%; roasted beef, 26%; baked bread, 80%; butter, 96%; boiled cabbage, 7%; raw cucumbers, 2%; boiled fish, 20%; fresh milk, 7%; roasted mutton, 30%; roasted pork, 24%; roasted poultry, 27%; boiled potatoes, 13%; boiled rice, 88%; sugar, 96%; boiled turnips, 4%; roasted veal, 25%; and boiled venison, 22%."

From this statement of Dr. Hall's a correspondent of the New York *Sun* makes the following deductions:

"The cheapest articles of food, except butter, are the most nourishing. A pint of white beans, costing a few cents, contain the same amount of nutriment as 3½ pounds of prime roasting beef, which is 12 times as expensive. Furthermore, a pound of Indian meal will go as far as a pound of fine flour."

In alluding to the above, the Boston *Journal of Chemistry* says:

"We call it a loose statement, and so are all the statements made in various books in regard to the comparative nourishing qualities of various kinds of food, as they are all based on some false premise; some, for instance, on the percentage of nitrogen in the food, others on the amount of water in it, etc. The result is an erroneous comparison, and the deductions drawn must be false. Thus in the above table, sugar is 96%, and turnips 4%, making 24 pounds of turnips equivalent to 1 pound of sugar; rice 88%, and roasted beef 26%, making 1 pound of roasted beef not much more nourishing than 4 ounces of boiled rice. The whole assertion is simply absurd and the table worthless, as every one will maintain who properly attends to the duty of selecting his food judiciously in regard to the wants he feels.

"We deliberately call it a duty to be careful in selecting our food; we even go further, and call it a crime not to feed well, or to be negligent in our selection, eating or drinking things we dislike, or, what is worse than all, eating when we have no appetite, simply because it is time for meals."

In speaking of a corn dict the same paper remarks:

"Very few constitutions can stand a corn diet. In most cases corn has a tendency to sour on the stomach, and by its continued use, chronic dyspepsia and premature death results.

"Man, and especially civilized man, needs a variety of food. The man who does a great deal of brain work requires different food than the man who only works with his muscles, as the one consumes more nervous material, and the other more muscular; and as different as the chemical composition of the brain and nerves is from that of the muscles, equally different must be the character of the food needed to supply the waste."

Carbolate of Soda for Whooping Cough.

Dr. Pernot describes in the Lyons *Medical Record* a very successful treatment of whooping cough with carbolate of soda. He places the carbolate of soda in a small porcelain crucible held above the flame of a spirit lamp, which keeps it in an unvarying temperature as long as wished. As the carbolate of soda becomes volatilized, the atmosphere of the sick room is impregnated with the vapor of carbolic acid.

When the crucible and lamp are not at hand, a satisfactory substitute is found in a fire-brick heated enough to vaporize the carbolate. In numerous cases the following results have been obtained.

1. A notable diminution of the paroxysms of coughing after from two to ten days' treatment. 2. Less labored and painful respiration. 3. Shorter duration of the paroxysms of coughing. 4. The most confirmed attack of whooping cough remains *in statu quo* from the commencement, and it always appeared to him to diminish more or less rapidly, but always in a time relatively short to its usual duration.

The vapors of carbolate of soda have valuable disinfecting and antiseptic properties

It is worthy of note in this connection that the fungoid origin of whooping cough, asserted some years since by M. Svetzerich, seems to be confirmed by the recent researches of M. Yschamar, who says he has found certain lower organisms in the spittle of whooping cough patients—organisms not met with in any other disease accompanied by cough and expectoration. He claims further, that the organisms in question are identical with those which, by their agglomeration, form the black points on the skins of oranges and the parings of certain fruits, especially apples. Thus, M. Yschamar, by inoculating rabbits with this dark matter, or even causing it to be inhaled by men, produced fits of coughing several days in duration, and presenting all the characteristics of the convulsive wooping cough.

THE ORANGE.—The orange is very easily digested, admissible in health and disease, and one before breakfast will often prepare the delicate stomach for a good meal better than anything else.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, March 1, 1879.

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The Week.

Lent has come in very quietly, and it seems as if its approach had brought a dullness in all matters of general interest. In most of the agricultural sections, the farmers are too busy putting in their crops to send us news, although from some parts of the north complaints of too much rain may be heard. The stir among mining circles comes principally from the hydraulic claims. Oregon exults over a new-found El Dorado along the Snake, and the placers of Nevada and Butte counties are also producing bountifully. Stocks are dull and buyers cautious. The interest in the Chinese question becomes more intense as the close of congressional session approaches. Disasters and accidents have been numerous during the week. Various parts of this State, the western coast of South America, and some of the Southern States, have experienced shocks of earthquake. The boiler explosion at Stockton, resulting in such terrible loss of human life, can only receive the old explanation of "carelessness." The Indians have risen in the North, and at the Black Hills, and are plundering and murdering on all sides. Floods, too, are desolating the northern part of the State, and Oregon. The insurrectionists in Central America are being worsted by the Government troops. France and England have found it necessary to send war vessels to Egypt to prevent the Khedive from compromising international interests by his misgoverument of that country. The weather is warmer and drier, and spring will open with bright, sunny days.

THE draft of negro laborers to Texas has impelled the Legislatures of Alabama and Georgia to impose a license tax of $100 upon every person soliciting people to emigrate from those States.

SEVERAL lines have been got around the sunken steamer *El Capitan*. She will soon be raised and taken to Oakland Point, where all necessary repairs will be made.

Where to Invest Money in Mining.

In reply to the letters that frequently reach us inquiring as to the best openings on this coast for the investment of money in the business of mining, we may say, it is not easy to point out these openings except with much qualification and in a very general way; so much depending always on the means and purposes of the party desiring to invest and the circumstances that surround each particular case. It can hardly be affirmed that any one section of the coast possesses such manifest advantages over every other as should determine this question, irrespective of the above considerations. To answer these questions intelligently and properly, one requires to be informed whether the inquirer is a capitalist or a working man; whether he wishes to put in his own labor, to be on the ground and supervise matters in person, or whether he is simply seeking a safe and profitable investment, leaving the management of the business to others. Where there is a preference for engaging or investing in any particular section of country or special branch of mining, it would be well also to indicate the same.

To men of limited means, who would like to obtain proprietory interests in mines, and with whom the certainty of moderate profits is paramount to large gains with corresponding hazard, California would seem to offer the best field west of the Rocky mountains; this being especially true if they desire to engage personally in the business, making permanent homes in the mining regions. For this opinion we have not here room to assign reasons in detail: the generally reliable character of the mines, the facility with which they can be reached, opened and outfitted, the cheapness of labor and supplies, the good state of society, insuring ample protection to person and property, and the superiority of the climate constituting, in brief, some of the principal arguments in its favor. The foothills of the Sierra Nevada and other outlying ranges of mountains, the sites of the several California gold fields, form one of the most beautiful, healthful and every-way attractive regions under the face of the sun. Apart from their mineral resources, they offer the greatest possible inducements for settlement by men desirous of obtaining pleasant and comfortable homes.

Then, in embarking in this industry, the adventurer has here a greater variety as to the kind of mining he may choose to engage in, there being the several branches of placer as well as vein operations from which to select, according as his means may warrant or other conditions make preferable. While there is now little chance for securing rich claims and making large wages in the placers of this State without the employment of considerable capital, it is still possible for the right kind of a man, though he have but little money, to get hold of claims that, even from the first, will afford living wages, and which, through the use of small means and under the diligent application of his own labor, can eventually be made to pay steadily and handsomely, if not very largely. The opportunities for accomplishing this much are, in fact, very good in many parts of the California mines, the central and more northerly sections of the State presenting perhaps more of these opportunities than the districts farther south.

As we had occasion not long since to speak of the inducements held out for the investment of capital in the quartz mines of Sikiyou and the hydraulic deposits of Trinity counties, we will, without stopping now to enlarge upon the resources of this extreme northern section of the State, briefly remark upon some points farther south, that seem to present openings that ought to attract the attention of parties desirous of investing in either quartz, drift, or hydraulic mining. In Shasta county, some good chances could doubtless be found for engaging in quartz mining. Plumas offers a fair field for vein and drift mining, the seasons, owing to the depth of the winter snows, being rather short for successful hydraulic operations. In Butte, while there is little chance for inaugurating further hydraulic washing, all the water available here being already appropriated, there are still opportunities in this county for opening up both quartz and drift mines, with good promise of success.

There is not, in the State, a county that more strongly claims the attention of parties seeking a legitimate field of investment than Sierra, and what we say of this county is largely the result of recent personal observation; not that the mineral deposits here were originally any better than throughout the tier of counties farther south, but simply because they have been less developed. This field is full of unaccomplished work, because it has been neglected. There is here material for prosecuting every form of gold mining known in California. Along Slate creek and its tributaries, have been lodged immense quantities of hydraulic tailings, that at small expense could be moved and subjected to a profitable re-washing. At Brandy City, and about Milton, are large deposits of auriferous gravel that could be run off by the hydraulic process to good advantage; those at the former place being partially utilized, but requiring some further money aid to make them fully available, while the deposits at Milton have never been worked, only prospected enough to indicate for them a great probable extent and richness. At this latter place are a number of fine quartz lodes, affording unmistakable evidence of good paying qualities, but, like the gravel, but slightly opened. The owner, Dr. Holdsworth, an old resident of Milton, would like some one having a little money to come and look at them. He does not want to sell them, but would convey to any party a large interest in them on condition of their putting up a small mill to work their ores. He would only ask for a prospecting mill at the start, satisfied that one of much greater capacity would soon be required; and it looks to us as if there were pay ore enough in sight here to run a hundred stamps for some years. Near Forest City, about Alleghany, and at many other points in this county, are found the remains of the old buried rivers, that afford good drift diggings.

In the counties south of Sierra, the opportunities for the inauguration of new hydraulic enterprises are limited, because of the inadequate supply of water for additional washing. But these counties abound with excellent opportunities for engaging in both quartz and drift mining, with occasionally a good chance for re-washing the hydraulic tailings, that in some localities have accumulated in great quantities. Some of the old bars and sections of the river beds are also being worked here by such improved appliances and methods as promise to make these ventures largely remunerative, the places favorable for this class of operations not being as yet by any means monopolized.

In saying so much of the openings that exist in this State for engaging in the business of mining, it must not be inferred that we wish to disparage the opportunities presented by the other States or the Territories lying on this slope of the continent, each of which contains a large scope of mineral lands, and some of which present, no doubt, greater attractions to the speculative and adventurous, than can be claimed for California. It is to that class of investors, with whom security to person and property, and certainty of return, are controlling considerations, that this State especially commends itself.

The East and the West.

There seems to be an awakening interest at the East in mining west of the Rocky mountains, and it is important to the whole country that that interest should be judiciously directed, encouraged and protected. Hundred of impecunious and unreliable adventurers with bonds or deeds to wild cat mines in their pockets, have gone from California, Nevada, Idaho, Utah, Colorado, Montana and Wyoming, to the populous and speculative cities of the Union to *sell* their locations, and the purchasers thereof, at one and the same time. We hear of sales having been made of Bodie locations and Bodie stocks, at New York city, which have not, as yet, shown any value whatever. We advise our Eastern friends to go slow; to thoroughly examine properties offered them before purchasing, and not to pay enormous prices for mere locations, or for mines that can be purchased at San Francisco, or on the ground for a comparatively small sum. There is still another class of mining operators who have their agents at the East, and who strike harder and deeper into the coffers of the capitalists there than the one we have adverted to. This class run the big assessment mines of the country and, through the force that wealth and power bestows, are foisting mines on the Eastern market that will eventually, in the end, cause the people there any amount of trouble and loss. The gold and silver mines west of the Missouri river yield over $100,000,000 annually, and profitable purchases can, with care, be effected and princely fortunes be derived from legitimate mining; but we feel constrained to caution our Eastern friends against being taken in by the adventurers who are now pouring in upon them. There never was a better time for engaging in actual and *legitimate* mining on this coast than the present; and while we feel called upon to put people abroad on their guard against the venders of worthless properties, we are free to admit that a very large proportion of those offered Eastern investors are in the hands of honest and honorable men, and really possess a great deal of merit. What we desire to enforce upon Eastern communities is the necessity of discriminating between these different kinds of men and properties.

WHERE UNCLE SAM KEEPS HIS TREASURE.—The vaults of the U. S. Treasury, which now contain many millions in gold and silver, have, as may well be supposed, been made as nearly fire and burglar proof as possible. The doors are a curiosity, and were made in Boston. The locks are chronometer, of the latest pattern. One man, and one man only, in the building can open the vaults. He can open them only on a given minute—then or not at all. It takes 500 men to do the business of the Treasury Department in New York. The highest office is said to be worth $35,000 per year, the lowest $10 a week. It took five barrow loads of gold to answer a single order lately, and that sum was wheeled from one bank to another. Though already so plethoric, these vaults are constantly receiving additional deposits of specie, $500,000 in silver having been amongst receipts of recent date.

A New Amalgamator.

John B. Reynolds, of this city, has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved apparatus for amalgamating the precious metals, by means of which every particle of ore is brought in contact with the mercury, so as to effect a thorough amalgamation. It consists in the use of a series of cylinders, in each of which a certain quantity of mercury is placed. The pulp is forced by a jet of steam into these cylinders and into the mercury, being heated and agitated at the same time. As it rises up through the mercury, another spray jet of steam is forced against the pulp, before or after it rises out of, or on the surface of the mercury, thus breaking up any lumps or masses of pulp, and agitating the pulp and mercury together. The pulp passes out of the top of the cylinder, and another jet of steam forces it down under the mercury in the next cylinder. Any number of these cylinders and steam jets necessary may be used. The process is continuous, the pulp being violently agitated while entering each cylinder and receiving an accession of heat from fresh jets of steam, as it passes from one to the other. Means are provided for controlling the supply of steam, preventing leakage, and for cleaning up the cylinders.

The operation of the device is as follows: The pulp from the batteries is admitted into the tank, where its consistency may be regulated with more or less water, as desired; but usually it will come from the batteries in proper condition for passing through the amalgamating apparatus. The pulp is allowed to flow from the tank down a pipe, at the lower end of which is the pipe leading into the front cylinder. Steam is turned on from the branch steam pipe through the nozzle into the pipe, which has the effect of forcing the pulp through the pipe into the cylinder under the mercury in said cylinder. The action of steam under these circumstances is to draw the pulp down from the tank and force it through the pipe, at the same time stirring and agitating it in a violent manner, so that it enters the mercury in the cylinder in a finely disseminated condition, most favorable for amalgamation of the precious metals contained in said pulp.

The mercury in the cylinder only occupies a portion of the space in said cylinder. As the pulp is forced in under the body of mercury, it rises through it, and on its way up, meets the spray from the spray nozzle, which violently agitates both the mercury and pulp, thus breaking up any masses or lumps of pulp which may have escaped the action of the first injecting.

As the pulp continues to be forced in, it rises to the top of the cylinder over the mercury and passes out into another pipe. As it reaches the end of the short arm of said pipe it meets the downward descending jet of steam from the nozzle on the end of the branch pipe, which forces said pulp down said pipe and into the next cylinder, under the mercury in that cylinder, where the operation herein described is repeated. As many of these pipes and connections, as may be considered necessary, may be used, the pulp each time passing under the mercury and being subjected to the agitating action of the steam jets, as well as to the action of the heat supplied by the introduction of fresh steam at different points.

The gauges show the hight of mercury in the cylinders at all times. The last cylinder of the series may not need any mercury and may be used to catch any particles of that metal which may be forced over with the pulp.

It will be seen that this process is continuous in its action and that no machinery is necessary for carrying the ore along through the cylinder. Steam may be supplied from the boilers which furnish steam for the crushing apparatus. The process employed is much more thorough than where amalgamation is attempted by passing the pulp over amalgamated copper plates, and is much less expensive than when the pulp is treated in pans, no loss of quicksilver being involved. When the cylinders are once filled with mercury, whatever may pass over will be caught in the succeeding ones or the last one. The manner of injecting the steam for transferring the pulp from one cylinder to the other is very effective, not only for that purpose, but for agitating and beating it as it goes through. Every particle of ore must go through the hath of mercury with no possible means of avoiding it, and the mass is so stirred and agitated during its passage that a thorough amalgamation of the precious metals is effected.

The pulp is thus agitated over and over, receiving a fresh agitation and a fresh supply of heat as it enters each cylinder. The use of the kettles or bowls saves any loss by leakage. The supplemental agitating pipe with the spray nozzle on its lower end, under the surface of the mercury, assists in overcoming one of the main objections previously urged against the plan of forcing ore under a body of mercury. When brought under the mercury, by a tube in the center of the bath, the pulp is apt to rise in lumps, the outside portions of which only are in contact with the mercury. This is caused by the weight of the metal keeping the pulp in the same shape in which it enters it. By violently agitating the mercury in the manner described and forcing the pulp into it, in a finely disseminated condition and by the addition of this supplemental agitating tube, any lumps that may have formed will be broken up and the pulp distributed evenly throughout the mass of mercury, thus allowing all the particles of precious metals in the pulp to come in contact with the mercury.

Brains in Mining.

Charles Schofield, under recent date, writes the Tnolumne *Independent* on the importance of employing brains—that is ability and judgment in the business of mining. We abbreviate his communication somewhat. During a long experience in mining, I have found, says the writer, that, while nothing can be done without labor and some capital, still I am of the opinion that four-fifths of the failures that have occurred in quartz mining in California are attributable to a scarcity of brains in the conduct of the business. The most common mistake has been that of building mills, roads, etc., before the mine was sufficiently explored to determine whether such expenditure would be warranted or not. Next has been that of going about the development of a mine in a round-about and expensive manner, involving everything in uncertainty, when a more direct and less expensive plan would have insured success. Managers lacking brains and experience, plan long tunnels and deep shafts without taking into consideration the natural dip of the vein or pitch of the chute, and having, after much expenditure failed to strike ore, come to the conclusion that the vein *don't go down;* whereupon a new management is inaugurated or the enterprise abandoned, generally the latter. Having by a number of practical examples illustrated this sort of mistake, the writer proceeds as follows.

"After citing one more instance I will, as the lawyers say, submit my case.

"A *gentleman* in San Francisco made an investment in mines, not very far from Groveland, and placed a brother in charge, whose only recommendation was the fact that he was known to be good for nothing else, and therefore upon general principles it was thought he ought to make a good mining superintendent. The consequence was that he attracted a class of men about him as ignorant and worthless as himself, and selected his boarding-master as his principal adviser, or in other words, to furnish brains for the enterprise; and as the *gentleman* last mentioned did not happen to have a very large supply of that article, besides having to divide with his Chinese cook, there was a very small amount left to be applied in furthering the business in hand. The upshot of the matter was, that where it was thought necessary to sink a shaft, they were sure to start on the wrong side of the vein; and where a drift was to be run, it was in the opposite direction from where the pay chute was known to lie; where they found themselves directly under the chute they sunk directly away from it; and without waiting to ascertain whether they had a mine or not, they built a mill for which they never had any use, as they never succeeded in finding any rock, although an abundance of rock was close by and almost in sight. The consequence of this management was that they got in debt to nearly everybody, and finally left in disgust, which was only equaled by the disgust of their creditors.

"There is also occasionally a great lack of brains among mill men. Some mills, like the Golden Gate, are loaded down with all sorts of useless traps, clogging the power and requiring two or three extra men to run it, while others scarcely have anything to save their gold, to say nothing about sulphurets, be they ever so plenty and rich. Some mill men show great tact in running their tailings into a river, creek, or some other place where the waste cannot be seen; and though they are known to be losing thousands, they keep on, unwilling to allow others to erect suitable machinery, even though they are offered one-half of all that is saved without any expense on their part.

"Then sheer stupidity sometimes works a deal of mischief, as is shown in the case of the Star Co. above Columbia, who had a small mill erected, with the best of appliances for saving sulphurets. Their sulphurets being plenty and rich it was their principal purpose to save them. Among the quartz as brought to the mill was a large percentage of slate full of thin films of mica (sulphate of iron.) This light flaky substance, having been mistaken for genuine sulphurets, the superintendent used all his energies to save it, and as it was very light and floated with the water it required no small amount of skill. He erected large tanks below the concentrator; but as these would soon get full and run over, his distress was unbounded, and although all else seemed to work well, and the mica lost, was not worth a cent per ton, its loss caused him to stop the works, and a general collapse ensued from which it is doubtful whether he will ever recover."

THE INTERNATIONAL PHYLLOXERA CONGRESS. It will be remembered that in August, 1877, an international congress of wine-growing countries was held at Lausanne, at the instance of the Swiss government, for the purpose of devising some common measure of repression and prevention of the phylloxera plague. The negotiation then set in progress have led to a joint agreement in common action between Germany, Austria, Spain, France, Italy, Portugal, and Switzerland, the ratification of which by the Swiss government is now expected. Soon we shall doubtless learn the character of the international campaign which is to be undertaken against the insect.

THERE is a surplus of gold in Omaha.

The Ethics of Journalism.

In no country on the face of the earth has the newspaper gained such an autocratic position as in the United States. One of our national prides is our freedom of the press. Whatever other powers the people have relegated to their law-makers, they seem to have refused the power to interfere with the newspaper, except in cases of gross libel, which the courts shall adjudicate. This is well enough. We do not believe that any general act can be framed for the regulation of the public prints which would not do as much evil as good; which would not abridge true freedom as well as repress license. The regulation of the press is in the hands of the people, and that is where it rightly belongs, for the press is, in a certain sense, the voice of the people, and the people can determine whether it shall be false or true. It rests with the patrons of newspapers to decide what their code of ethics shall be. From them comes the support which makes newspaper existence possible; with them lies the power to say whether this existence shall be for good or for evil.

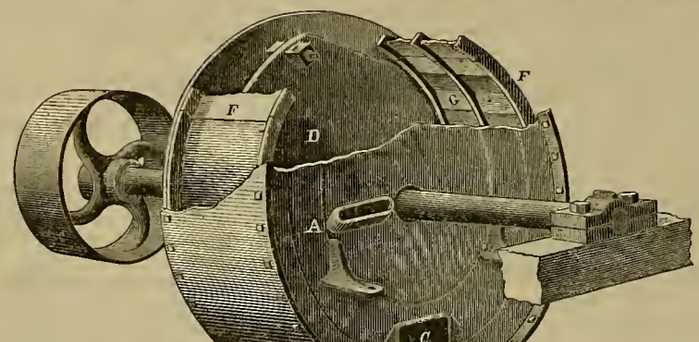
There can be no doubt in the minds of any one who reads the newspapers of the day that the public is often too lenient with the creatures of its power. Policies and motives are permitted to thrive in the conduct of newspapers which would not be tolerated in any other concern or institution existing by popular favor. And the evil is most insinuating and demoralizing. Men who would cut from their acquaintance one whom they detected in an outright falsehood, will continue to contribute money to the support of papers which they know well are given to the publication of the most shameful lies. Men who would strike to the earth any one who should carry a suspicion of shame to the purity of their households, will welcome, day after day, sheets which are reeking with polluting influences. Men who are quick to discern the rogue who would undermine their success and risk their fortunes under the guise of friendship, will still contribute to the support of papers which they plainly see are propagating the deadliest fallacies in the garb of philanthropy, or reaching for the rewards of demagogism under cover of claims for public benefit. Men who would denounce such wrongs if attempted in any other form, will quietly gulp down these sugar-coated pills of perfidy and perdition administered by the public press. And while prints, which are thus encouraged by patronage, can hold the support of the truth-lovers and at the same time serve for hire the interests of those who thrive upon the success of sinister designs, it is little wonder that we see such perversions of the freedom of the press as now exist. It is simply by the public sufferance that such things are possible. It is simply because the managers of such low-toned and truckling sheets can bag the dollars of the well-disposed but thoughtless people, and at the same time drive bargains to sell the influence which this patronage bestows to those who will pay highest for it, that we see the wonderful and disgraceful exhibitions of journalistic gymnastics.

This is not a pleasant theme, but it is one of the utmost importance. What surety of right and safety is there when the voice of the people, as spoken by the press, is permitted to sink to the approval of false ideas of public policy? Who can tell to what end of wrong the tendency may go which takes its rise in the subjection of principle to the claims of private interest. What encouragement is there to individual uprightness, truth and nobility of purpose when the public press makes yesterday's outlaw the hero of to-day? What surety of the permanence of a good name by a life of disinterested goodness, when those who were yesterday pronounced dangerous to the public safety are to-day proclaimed the people's saviors? Blinded by partisanship and led by greed for gain, journals which public patronage should make zealous custodians of the general good are transformed into cringing, truckling servitors of personal ambition and propagators of profitable falsehood.

Is there no remedy? Yes, there is a sovereign remedy so long as the majority of the people are, as they are to-day, truth-lovers, patriotic and resolute. No fire will burn without fuel, and no service of the false will succeed unless it have the support which the friends of truth afford. If any journal gives unmistakable signs of selling truth for selfish gains, cut it off. Let it lose the support of the upright, and it will fall. If a journal aims to thrive by furnishing a fund of incidents and ideas which appeal to the baser passions, and fill the mind with low and groveling thoughts, banish it from pure homes into the outer darkness which its tastes approve. There may be other approaches to the journalistic heart, but the one which is most available to the public is through the cash box. Withdraw support, and the proudest structure falls. Withdraw support, and the journal which lends its eminence to the service of evil, will either purge itself of its evil or go down with it. Thus the people may determine that no journal shall live unless its ethics be high-toned and true. Unless it labor for truth, for purity, for uprightness in individuals and in public affairs, let it be plain that the public does not approve of its existence. There is no surer way for the people to secure a press which shall be true to the trust placed in its hand. There is no more direct way to determine that the press shall be held true to its high mission, and that is, free, fearless and untrammeled maintenance of the right, and unyielding denunciation and suppression of the wrong, in whatever varied forms it may appear. The remedy is sharp and decisive: be sure that the occasion calls for it, and then apply it quickly, as one would set foot upon the reptile which invades the home. There is no deadlier foe to public safety than falsehood in the public press.

Gold in India.

Since the finding and partial re-opening of ancient gold mines in India, with some remains of the implements by which they were formerly worked, the following from a London paper relative to the recent discovery of gold-bearing quartz lodes in that country will be read with interest. According to their late report it appears that the Moyan Coffee Co. leased, last year, a portion of their property to the Prince of Wales Co. for the purpose of having it prospected. The result was that from 20 tons of quartz, 45 ounces, 6 pennyweights of gold were obtained, inducing responsible parties to apply to the company for the exclusive right to work their lodes.



THE DAVIS ORE PULVERIZER.

The board stated that they knew the company possessed a large area of reefs, and that Mr. Brough Smythe (the Minister of Mines in the government of Victoria) had been deputed to thoroughly inspect the country, and from the company's lands gold was produced in small but perfectly visible quantities. The chairman, Mr. A. Hall, congratulated the shareholders on the fact that large quantities of gold had been recently discovered on their property; and, in reply to a shareholder, who asked whether the government reserved the mineral rights of the land, Mr. Hall said that he consulted all the title deeds, and there was no reservation in that respect. He had also consulted gentlemen in the India office, and the government had not made, and were not likely to make, any claim to those rights. After some discussion with regard to suggestions as to the forming of a new company or altering the present articles of association to enable the company to deal with and develop their gold prospects, it was resolved to form a committee of gentlemen possessed of mining knowledge to thoroughly investigate the subject.

JOHN MILES who acquired notoriety at Salt Lake last fall in the Miles-Owen polygamy case, has been surrendered by his bail to the United States Marshal, and incarcerated in the penitentiary.

THE millmasters of Ashton-under-Tyne have decided to begin a general lockout on Saturday if the strike is not settled. The strikers are estimated at 10,000.

THE French Atlantic cable is broken 161 miles from St. Pierre Miquelon, in 500 fathoms of water.

The Davis Pulverizer.

We illustrate herewith the Davis ore pulverizer, a California invention, which is now being introduced to the mining public. These machines are at work in this city; at the California Portland Cement Co., at Santa Cruz; the Wasson S. M. Co., New Boston, Esmeralda county, Nevada; Angel's Landing, Carson Hill, Calaveras county; at the Gunsight mine; one at Oroville; one at Meadow Lake, etc. That at the Santa Cruz Cement Works is stated by the manager to run 3,300 pounds per hour through a No. 50 screen.

The various parts of the machine, and its mode of working, can be fully understood by referring to the illustration, where *A* represents the feed opening through which the ore is passed into the machine. *B* is the discharge spout, which can be set at any angle desired, but is found in practice to work best by being at the bottom, as represented in the cut. *D* is the disk to which the shoes are secured. *FF* are the corrugated dies around the periphery. *G* represents the face of the die; also, the annulus or ring that divides the machine, so that it may be fed from either or both sides, as desired. *E* represents the shoes attached to the disk. *C* is a hand-hole for putting on the shoes or changing them when worn.

The pulverized ore passes out by the force of air between the openings at the ends of the dies, and is discharged against the outside shell, finding its way out at *B*. When the shoes, *E*, are worn so as to require changing or turning, it is only necessary to remove the hand-hole plate at *C*, loosen the nut with a socket wrench, and replace them. The outside case is made of heavy sheet-iron, put on in sections, and secured with bolts to the projecting flanges, so that the dies can be changed or removed in a short time.

The principle upon which the machine works is that of attrition—that is, particles of ore coming in contact with each other at a high velocity—the office of the machine being to keep the ore in motion until its reduction is complete. It takes rock from the breaker, and by adjusting the outlets, which can be done in a few moments, delivers it in a continuous stream, reduced to any fineness desired. Its construction is simple. The only parts that do wear are made of cast-iron and can be readily obtained from any foundry.

Each one of these machines is claimed to equal in capacity 20 stamps; and it is also claimed that they do the work with much less power.

The machine is made of such light parts that it can be transported to any portion of the country on pack mules, and for prospecting can be made to suit any required want. They can be set up in three or four days, requiring only a few timbers as a foundation. There is but little machine work about it. All the parts that do the work are made of plain cast white iron, and can be replaced in a few moments.

There are no grinding surfaces in the machine; no points where iron comes in contact with iron. The ore is taken up by the shoes, and thrown against the corrugated disk of dies and reflected, when it is again taken up and again thrown against the disk, and this is repeated until the ore is sufficiently fine to pass out of the orifices, the discharge being produced by the impact of the atmosphere. By this device, a uniform pulverization is secured.

These machines are made by the Davis Pulverizer Co., the office of which is at rooms 9 and 10, No. 405 California street, where further information will be given if desired. The machine is of course intended only to crush dry, and is, therefore, especially adapted for gold ores. It will, however, of course crush any kind of ore, rock, etc., or, in fact, anything of a hard nature.

AN ARIZONA FIBER PLANT.—We read in the *Arizona Sentinel* of a new fiber plant (botanical name unknown) which grows wild in large quantities on the Colorado river bottom. Specimens have been shipped East and they are said to have excited great interest among the manufacturers of fine fabrics in New York and New Jersey. It is said to be in every way superior to ramie, and dresses up with a finish equal to that of the finest silk. The specimens of the fiber shown at the East, and also sent to Europe, were five and six feet long, and by their beauty, strength and length, created quite a furore among certain wealthy manufacturers. A botanist has been sent out there and is now traveling on the river gathering specimens for classification, estimating areas covered by the plant in its natural growth, and examining into the feasibility of its profitable gathering, or cultivation for commercial purposes. The Southern Pacific Railroad Company takes an active interest in this matter and is lending material assistance toward its investigation. The plant forms dense thickets on the river bottoms, growing to a hight of four to seven feet, in stalks little larger than a lead pencil. Its roots are very tough and so matted together that it takes at least two yoke of oxen to draw a plow through them.

THERE will be 13,697 feet of tunneling between Alma and Santa Cruz, on the South Pacific (narrow gauge) Coast railroad, of which 7,514 feet are completed, leaving 6,183 feet unfinished.

Railroads.

Guatemala Railroad Co.

Chronicle, Jan. 14: The ship *Reunion*, at Mission-street wharf, chartered by the Guatemala Central Railroad Co. takes a cargo of railroad supplies to the port of San Jose de Guatemala, to be used in the construction of the road extending from the latter port to the city of Escuiutla, Guatemala, 28 miles from the sea. The cargo will consist of about 1,800 tons of railroad ties, a large quantity of iron-plating and castings for building purposes, coal, rice, construction implements, and last, but not least, about 100 Chinamen, who will be put to work at once on the line of the road. Seven miles of the road-bed are already prepared for the rails, and they are on their way from New York via Panama, and will be received in San Jose about the time the *Reunion* reaches there. This enterprise, the successful inauguration of which has been quietly accomplished, cannot fail to ultimately result in great benefit to San Francisco. The present objective point of the company is Escuintla, to which city they have a franchise from the government of Guatemala for 99 years, and during the first 25 years thereof, after the opening of the line, they are guaranteed a net profit of 12% per annum on $1,000,000 and a loan of $210,000 towards construction. It is the intention of the company to eventually push the construction of the line to the city of Guatemala, almost 60 miles inland.

The city of Escuiutla is the great center of the coffee trade of Guatemala, and, when once facilities are given for moving it, the production will be greatly increased. The present annual exports from the coffee section consist of about 6,000 tons of coffee, 300 tons of cochineal, 300 tons of hides, 300 tons of rubber, cocoa, etc., 300 tone of timber and native manufactures. By far the most important of the future prospects of this road, however, is its extension to the Atlantic side, a distance of little more than 200 miles, where it reaches the magnificent harbor of Santo Thomas, the finest port between New York and Rio Janeiro. The Gnatemala route has no serious topographical difficulties to overcome, and is 2,000 miles shorter than the route via the isthmus of Panama.

Oregon and California.

The *Oreyonian* of January 25th, says: Mr. R. Koehler, agent for German capitalists interested in the O. & C. R. R. and O. C. R. R., was called some months ago to Fraukfort-on-the-Main to report to the boudholders, upon the affairs of the road. He returned by the *Oregon*, on her last trip, and he confirms a statement, that the bondholders have decided to extend the road to Corvallis, 50 miles from its present terminus. He informs us that while in New York Mr. Villard and himself contracted for steel rails, the same in pattern and weight as those on the Central Pacific road between Sacramento and San Francisco, and for all the necessary rolling stock and motive power. The rails are completed, and will be shipped for Portland immediately. Mr. Koehler has contracted for ties and has put in the field a locating party now busy in the vicinity of McMinnville. The road will go by way of Amity and Dixie. Grading will commence as soon as right of way is obtained.

Oregon Narrow-Gauge.

The *Oregonian* further publishes the following from Ellis G. Hughes, Vice-President of the road, copied from the Brownsville *Advertiser:*

Your favor of the 19th inst. making enquiries as to the use of Chinese labor in the construction of the Oregon Narrow-Gauge road is at hand. It is our purpose to do almost the entire grading of the road with plows and scrapers, and in such work only white labor can be used as a matter of course, nor do we intend to use anything else in getting out ties, laying track, etc.; however, there are some parts of the work such as heavy cuts, etc., which will probably be let by contract. When we let in this way we will let at the lowest prices attainable, and as a matter of course the contractor will employ such labor as he chooses.

The subscription at Salem is progressing favorably, and I donht not will be closed in a few days, and at Lebanon, Scio and Aumsville, and elsewhere along the line the people are alive to the importance of the road to them and are earnestly pushing forward the good work, and I have no doubt will have their part of the subscription complete in a very short time.

As we must await the completion of the subscription before ordering our material from the East, or taking any active steps in the construction of the road, it is desirable to have the entire matter closed without delay if it is desired to have the road completed this year, and if there has so far been only $10,000 subscribed for Brownsville and the surrounding country, it is necessary that it push the work with more energy if it would not he left in the race.

Santa Rosa and Napa.

The project has been revived for the construction of a railroad from Santa Rosa to some point in Napa or Solano counties. The object is to place Sonoma county generally in direct communication with the Sacramento valley and the railroad system of the State. The proposed road will also be of advantage in other ways. The North Pacific railroad will soon be extended from Cloverdale to Ukiah. This will make the projected road an outlet generally for the northern coast counties. All passenger travel and freights from Sonoma county to the northern portions of the State are now carried by water to San Francisco, and thence to the Central Pacific and California Pacific railroads. This occasions great loss of time, besides incurring considerable expense in the handling of freight. Sonoma is one of the leading counties in the State for producing early fruit; but the growers there must remain at a disadvantage, so far as Eastern markets are concerned, until there is direct communication with the trans-continental road.

The entire length of the proposed road will be 38 miles, of which the distance between the towns of Sonoma and Napa junction is 13 miles. It can be graded its whole length at an average cost of $1,500 per mile. The ties would cost, in addition, $600 per mile. Engineering and other expenses will raise the cost of the road-bed to about $125,000. The citizens of Sonoma county propose to subscribe that amount, grade the road, put the ties down, and then bond it to some Eastern manufacturing firm for supplying rails and the rolling stock.

There is still a large area of redwood forests in Sonoma county. Although they are within a comparatively short distance from the Sacramento valley, yet lumber from the mills of Sonoma for that district has to be carried between 200 and 300 miles. The projected road will open direct communication, and thus increase the facilities for putting down the lumber of Sonoma in all the counties of the Sacramento valley. Such a road as the one projected must be constructed at some time, or Sonoma county must remain isolated from the northern counties of the State.

Atchison, Topeka and Santa Fe.

According to the Silver City *Herald*, a great reduction has been made in the passenger fare on this road. This reduction took effect January 1st, 1879. To all points in Kansas rates are reduced to four cents per mile. Through rate from Trinidad to Kansas City is $28.25. One thousand mile tickets will be sold for $30. No second-class or shipper's ticket will be sold. Also, freight tariffs have been greatly reduced, and hills of lading will he made by agents of the A. T. & S. F. to all points on the D. & R. G.

South Pacific Coast Narrow Gauge.

A correspondent of the Santa Cruz *Sentinel* writes as follows: This railroad is being constructed in a solid and substantial manner, the ties and iron being of extra thickness. A railroad man of much experience says that it will he one of the best and safest roads in the United States—that is, for a narrow-gauge. The road will probably not stop at Santa Cruz, but be run on south. Branch lines will probably be run in through Hihu's Angmentation, and it is probable that a line will be run from Felton to the Great Basin. The camp at the south end of Tunnel No. 6, presents an animated appearance; 450 Chinamen and 50 white men are encamped in the canyon. A white man has started a saloon, and a Chinaman, a store and opium den. The Chinamen employed by the contractors are all hired from two companies in San Francisco, and are little better than slaves. They receive nothing directly from the men for whom they work—all the money is paid to the company, which pays them when the contract is completed.

In Nevada.

The Gold Hill *News* of Jan. 21st, thus discourses: D. O. Mills, the chief owner of the Virginia & Truckee railroad, has returned from his Eastern trip. It is generally understood that his mission East was to buy railroad iron and rolling stock for the proposed railroad from the Mound house to Bodie. The contract to cut 250,000 ties was made last September, and they are ready now. In a year the road will be running to the new camp, and in two, it will be pressed through to Los Angeles, and give us another route to California. It will be of the same gauge as the V. & T.

Clinton Narrow-Gauge Railroad.

The San Francisco *Bulletin*, of January 24th, has the following: This is a private enterprise seldom spoken of, yet of considerable magnitude. It is used for logging purposes, and is four miles in length, tapping the heavy belt of timber near Lake Tahoe. At the terminus of the road there is a chute 1,700 feet long, into which the logs are dumped. Down this chute they fly and fall into the river. Once there it is an easy matter to take the logs to the mills. The workmen, taking advantage of the hardness of the ground, are bringing from 60,000 to 70,000 logs daily, to he taken down in the spring. The road has one locomotive of seven tons weight, and six flat cars. The cars can convey 100,000 logs daily to the head of the chute. There is talk of pushing the road through to Lake Tahoe

---

To Make Iron Take a Bright Polish Like Steel.—Pulverize and dissolve the following articles in one quart hot water: Blue vitriol, one oz.; borax, one oz.; prussiate of potash, one oz.; charcoal, one oz.; salt, one-half pint; then add one gallon linseed oil, mix well, bring your iron or steel to the proper heat and cool in the solution. It is said the manufacturers of the Judson governor paid $100 for this recipe, the object being to case-harden iron so that it would take a bright polish like steel.

A great deal of difficulty is experienced in cementing metal to glass. The *Faerber Zeitung* says that a mixture of two parts finely ground litharge and one part white lead, and working it up to a stiff paste with three parts boiled oil and one part copal varnish, adding more litharge and white lead as required, is the best material for joining the two substances.

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Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

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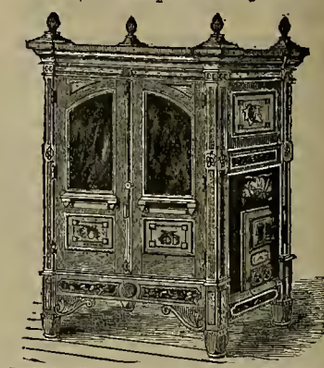

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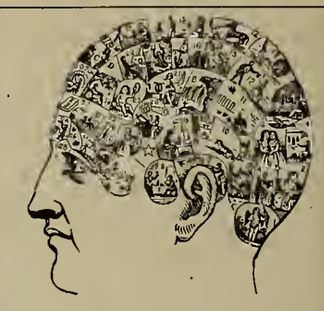

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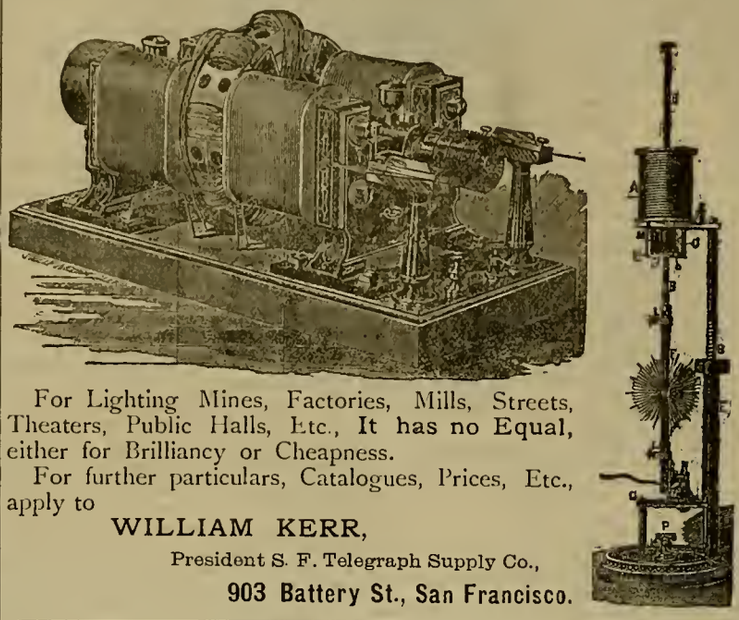

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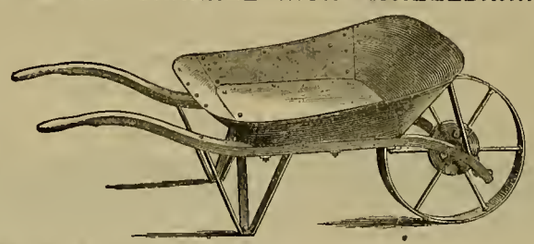

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[Continued from page 133.]

very smoothly on Jackson ore, mixed with other ores, smelting daily 35 to 36 tons. Ore is being delivered from the Williams, Adams Hill, Dunderberg, Bullwhacker and other mines.

MAJOR MCCOY is working eight men in the Grant, and taking out some rich silver and lead ore. No mine in the district gives brighter promise of a rich yield.

PARTIES from Tem Pahute say that the Wyandotte company's ledge is eight feet wide in ore of a high grade. Twenty-eight men are employed, and no more are needed. The company has labored under many disadvantages, especially in regard to water, which they are gradually overcoming. They propose to bring water a distance of 80 miles. The company's bills are paid regularly every month.

PARADISE DISTRICT.

PARADISE VALLEY.—*Silver State*, Feb. 24: At north drift below tunnel No. 1 the ledge is considerably mixed with slate in the upper part of the drift. The slate is crowding down on the ledge. Bottom of drift nearly all in quartz. Tunnel No. 2 will soon be under this drift and below the break. A fine ledge of high grade ore is exposed in the Bray cut. No work is being done at this point. Work on tunnel No. 2 is being pushed ahead, and will soon strike the ore body, which will lessen the cost of extracting. In the fifth level and open cut a fine body of ore is being opened up. The ledge on the fourth drift, which has been small and of a low grade, is improving very rapidly, both in size of ledge and quality of ore. From present indications we shall soon open up a fine body of ore in this part of the mine. In tunnel No. 5 work is progressing very slowly, as but one shift is being worked. This work is being done by contract. The mine is extracting and shipping daily about 10 tons of ore to the Rye Patch mill; also taking out a quantity of low grade ore, which will pay to mill when the company erects a mill.

WHITE PINE DISTRICT.

THE BALDY SOUR COMPANY.—Eureka *Sentinel*, Feb. 16: Col. Robinson has ordered work commenced on the Baldy Sour and Sweetwater mines. On the former, which has 100 feet of tunnel completed, a contract has been let to drift north. A contract has also been let to sink a shaft on the Sweetwater mine. The indications on these two mines are very encouraging. Col. E. N. Robinson is President of the Baldy Sour company, and left for New York several days ago, where he will perfect his financial arrangements, and return to White Pine in a couple of months.

REESE RIVER DISTRICT.

WESTERN NYE.—Grantsville *Sun*, Feb. 17: The Alexander mine is yielding richer ore than ever, and new discoveries and rich developments are constantly being made. The mill has been running uninterruptedly during the past week, and is doing splendid work. The company have shipped $9,000 in bullion.

BELMONT DISTRICT.

BELMONT.—*Courier*, Feb. 22: The mine is looking fully as well as at any time, and the stopes yielding their usual amount of rich ore. Have advanced 300 level drift 11 feet during the past week in hard-blasting ground; are at present running in the footwall, but expect to be in ledge again by the end of the coming week. The vein in this level has been very irregular its entire distance from the shaft, and to avoid making sharp curves in a working drift, they are compelled, at times, to go in foot or hanging wall. Have advanced south raise, north end of mine, 15½ feet in a good, strong vein of quartz, which is three feet thick to-day at face, showing some nice bunches of ore all through it, but is not rich enough to pay for saving yet. Number of tons assorted ore for the week, 12; average assay, $106.

HIGHBRIDGE.—During the week the usual amount of work has been done in the different ore stopes with good results. On the lower level they have advanced the drift north 25 feet; total distance from shaft, 50 feet. South drift advanced 32 feet; total, 47 feet.

GILA.—During the past week the crosscut was advanced 18 feet, with little change in material. In cutting out for the station, 164 feet below this crosscut, they discovered a promising streak of vein matter. They are in on it now a distance of 20 feet, with very encouraging prospects. It will be followed until some change takes place, when sinking will be resumed in the winze, which cannot be done at present with their limited hoisting facilities; the rock being soft in both places, either one of which will keep the windlass constantly employed. The south drift winze shows no change.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, Feb. 21: There is a continued improvement in the quality of the quartz found in the Metamora shaft, now in 160 feet. We hear good accounts from the mines at Gold Hill and Lost Gulch sections. They hold out well when sunk upon. A new discovery has just been made of a very large lode, carrying both gold and silver. There is a prospect of the Miami mill getting a liberal support from this region at an early day. At the end of a 21-foot drift, in the 120-foot shaft of the Silver Queen, property of L. G. Crane, the ledge has been struck showing leaf silver. The Alice shaft is down 95 feet and a streak of 18 inches of good ore is found in the bottom. There is some nice ore on the dump. Fifteen miners at work on the McCormick mine. New discovery in the tunnel of Stonewall Jackson is rich, and promises to be extensive. The Washington lode, formerly known as the Aiken, promises well. The Hannibal Mining Co. has let a contract to run a drift in good ore. Work is to be resumed on the Champion mine.

PATAGONIA DISTRICT.—*Sentinel*, Feb. 23: The murder of Messrs. Finlay and Adams caused the suspension of operations, though the mine was then making a splendid showing. The ore vein is of great size and fair grade, and magnificent bodies of metal have already been exposed. The mine lies in a thickly wooded and grassy country; close to the cheap labor and cheap supplies of the Santa Cruz valley; and within little over 247 miles of the seaport of Guaymas, over an excellent natural road now about to be used for the new Guaymas railroad.

PAPAGO MINING DISTRICT.—*Star*, Feb. 20: The shaft on the Alleghany is down 30 feet with rich chlorides at the bottom. Shaft is five feet wide and all in ore, and the width of the vein has not yet been ascertained as it is much wider than the shaft. The ore assays from $75 to $100 in silver. On the Pittsburg there are three shafts, the one now being opened is down eight feet, going down on the foot wall, and has three feet of metal. This ore averages from $50 to $150 per ton in silver. The San Juan has two tunnels, the first on south end of the lead is in 137 feet. There is a shaft on the lead in the tunnel 20 feet deep and the metal at the bottom of this shaft is 14 inches wide. The tunnel on the north end is 47 feet. Shaft upon the lead in this tunnel is 18 feet deep and has eight inches of rich ore and a large body of average rock. Several experts have examined this mine and made assays which average $100 to the ton.

UTAH.

BINGHAM.—Cor. Salt Lake *Tribune*, Feb. 23: The amount of ore in the Bulldozer in deposit is difficult to estimate. A drift of 280 feet has been run entirely in gold-bearing ore, free milling and bearing no lead. At the outset the footwall was struck, since which time the drift has been run entirely in ore. Free gold is frequently met with, and the pan produces colors in every wash. As this mine is in close proximity to the Stewart, upon the same hill and the same character of ore, there is no doubt that it will rank as high as any in the canyon. A recent strike in Barney gulch is attracting attention. The location was made last December, consequently not much work has been done. It is named the Greenborn. An incline has been run on the vein about 20 feet, and several holes sunk to trace the vein, which has been found to extend over 500 feet. Assays made from various portions of the vein run from $11 to $40 gold, carrying but little silver and no lead. The Saturn is turning out some fine galena ore. It is now under lease to Klopenstein & Co. The Moscow and Centennial are working on ore. The Bully Boy has been leased to Ben Kennedy and McCourt for a period of nine months. Mr. Duignan is working the Silver Hill with tolerable prospects. The Ashland is being worked under lease by Jackson, Trinneman & Co. They are making a shipment of about 25 tons of good ore.

MINING NOTES.—Silver Reef *Miner*, Feb. 15: A rich strike is reported to have been made in the Compton mine, adjoining the Duffin mine. The ore was struck in the tunnel at a distance of 150 feet, showing a body of about four feet of ore. The sinking on the Stormont mine goes regularly on at the rate of about two feet every 24 hours. The vein of ore is six feet thick, three feet of which is high-grade ore. When an additional depth of 50 feet is attained, stoping of the ore will be commenced. Pahria and Jackson have become synonymous words for fraud, humbug, and bilk.

News in Brief.

MAJOR RENO is not to be court-martialed.

SANTA ROSA had an earthquake on the 19th.

ANOTHER revolution has broken out in Hayti.

A STRIKE has occured in two cotton mills at St. Petersburg.

THERE are no flowers in Stanislaus county this month, as usual.

A NEW YORKER has started to ride on horseback to Patagonia.

A RISE in the Loire is causing disastrous inundations at Nantes.

GEN. SHERMAN will leave the East April 1st for the Pacific coast.

THE police put a stop to the female boxing match in the city.

ENGLISH hams are preferred to American in the Brazilian market.

ELECTRIC lights are being introduced into business houses in the city.

IN Big Cottonwood Canyon, Utah, there were 13 snow slides on the 10th.

THE police have so far made 164 arrests in this city the present month.

NEW YORK Custom House officials are collecting duties on smuggled dogs.

Two hunters were murdered by Indians near Deadwood on the 20th inst.

HALIFAX is blockaded by snow. The drifts in some places are 20 feet deep.

THE United States frigate *Constitution* has been towed into Lisbon disabled.

THE British steamer *Zanzibar* from New York to Glasgow is reported lost.

A NEW vein of coal has been discovered in North Park Colorado 18 feet thick.

GRAND DUKE NICHOLAS of Russia has been banished for publishing a pamphlet.

THE Atchinson, Topeka and Santa Fe railroad is completed to Otero, New Mexico.

ANOTHER expedition has been fitted out to search for the Walker Honduras treasure.

THE *Victoria*, the first ironclad vessel built on this coast was launched on the 22d ult.

ARREARS in pensions up to the passage of the Pension Arrears act, aggregate $34,000,000.

A POPULAR Mexican editor has been murdered at the instigation of a high government official.

AMADOR COUNTY contains 428,000 acres, of which only about 20,000 are under cultivation.

CAPT. PAUL BOYNTON has started to float from Pittsburg to New Orleans in his life-saving suit.

MANY people are building floating houses along the Sacramento river in preference to dry land lots.

THE War Department has ordered ten of the new Hotchkiss mounted field guns for use on the frontier.

BOSTON has sent out 600 kegs of horse shoes for the use of London, Liverpool and Cork omnibus horses.

UP to the present writing there have been issued 32 whisky licenses in the new town of Otero, New Mexico.

IT is said that a sufficient quantity of cocoons was raised in Utah county, U. T., last season, to make 500 yards of silk.

AN ocean steamer, 1,200 feet long, of 100,000 horse power and able to sail 23 miles an hour, is being built in the East.

THE business men of Bodie talk of organizing a protective association against the numerous deadheats of that section.

LIEUT. FLETCHER who so disgracefully eloped with Miss Bailey of Baltimore, has been found and will be court-marshaled.

A TEN-year-old boy in New York killed his grandmother in a fit of passion and was sentenced to 30 days' imprisonment.

AMONG 205 doctors recently graduated from the University of the City of New York, the second on the list is a Chinaman.

THE surface of Tulare lake is now about 18 feet below the high water mark of 1862. The greatest depth about 20 feet.

THE Comstockers have ceased pumping water into the Sutro tunnel, and negotiations are to be resumed with a view to a compromise.

THE dead-lock in the House concerning the proposition for the repeal of Federal Election laws is likely to be of long continuance.

SEWARD, American Minister to China, refuses to produce certain official books in his possession, on the ground that they will criminate him.

AN early rupture is predicted between Gambetta and his republican followers, in consequence of the severe discipline in the Chamber.

SEVERAL horses in the vicinity of Sublimity, Oregon, are sick from the effects of an epidemic now going through that region. No case has as yet proved fatal.

A SAFE and commodious harbor has been discovered on the coast of Oregon, a few miles north of Cape Foulweather. The entrance is estimated to be 1,000 feet wide and 50 feet deep.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING FEBRUARY 18TH, 1879.

IMPROVEMENT IN FLAVORING COMPOUNDS FOR TOBACCO.—D. Sternberg, S. F.

TOBACCO-CUTTING MACHINES.—L. Bauer & J. Seitz, S. F.

RAILROAD CROSSINGS.—W. B. Bernard, Sacramento, Cal., and J. D. Perkins, Elyria, Ohio.

BILL FILES. -E. H. Owen, Los Angeles, Cal.

SEWER TRAPS.—J. P. Cahill, Oakland, Cal.

——The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ORE WASHER.—Constant Duhem, San Francisco. This is an improved ore washer and amalgamator, which we described somewhat in detail a short time since, when one of the machines was made at the Pacific Iron Works for shipment to the Gila river dry placers. The improvement consists in mounting above a suitable tank a double, perforated conical cylinder, arranged to rotate, and having internal screw-shaped flanges to carry the material through to the discharge end. The fine material and precious metals, which fall through the perforations of the cylinder, drop on to enclosed amalgamated plates attached to a cradle in the tank, said cradle being given an oscillating or rocking motion by means of a toothed wheel on the cylinder. There is also a peculiar trap or adjustable screen on the cylinder designed to catch nuggets, and under it is placed, on the cylinder cradle, a settling apron for separating coarse gold from the gravel. The *debris* or tailings in the tank are discharged by an ejector which carries them up over the edge of the tank and out of a discharge pipe.

MOUNTING RIFLE SIGHTS.—Chas. Slotterbeck, Lakeport, Lake Co., Cal. This invention relates to a novel method of mounting telescopic sights upon breech-loading rifles, so that the telescope will not interfere with the action of the breech mechanism or the loading of the gun, nor displace or interfere with the ordinary sight. In the ordinary method of attaching a telescope to a rifle, it is mounted over the center of the barrel, and thus displaces the ordinary open or globe sight. It also extends so far back over the small of the stock, that it is totally inapplicable to breech-loading rifles of many description, and inconvenient upon any. This invention consists in the employment of a device by which the telescope can be accurately mounted without interfering with the ordinary sights, and at the same time be intirely out of the way of the breech mechanism.

ROAD AND FIELD LOCOMOTIVE.—Holbrook & Pooler, Half Moon Bay, San Mateo Co. This invention relates to an improved road and field locomotive and traction engine for drawing agricultural implements or loaded wagons over fields or roads, and the improvements consist in a novel construction and arrangement of the legs, feet and operating parts in that class of traction engines in which a number of feet are employed to push the machine along, and in a peculiar method of operating these feet, so that the whole force of the engine is expended in producing tractive force and not wasted in lifting the machine at some point of its stroke.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

ANY person receiving this paper after giving an order to stop it, may know that such order has failed to reach us, so that the paper is continued inadvertently, and they are earnestly requested to send written notice direct to us. We aim to stop the paper promptly when it is ordered discontinued.

M. D. SHRADER is now an authorized agent of the PACIFIC RURAL PRESS, also MINING AND SCIENTIFIC PRESS, to solicit subscriptions and receive the money for the same. His receipts given for such money will be duly honored by this company.

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METALS.

[WHOLESALE.

WEDNESDAY M., February 25, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @— —
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	6 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

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EXCHANGE on New York, 20, on London bankers, 482½@ 484. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 87½@88.

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QUICKSILVER in S. F., by the flask, ₱ lb. 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending February 25, 1879.

Feb 19	Feb 20	Feb 21	Feb 22	Feb 23	Feb 24	Feb 25
HIGHEST AND LOWEST BAROMETER.						
30.239	30.236	30.250	30.199	30.198	30.198	30.156
30.146	30.127	30.203	30.164	30.145	30.121	30.112
MAXIMUM AND MINIMUM THERMOMETER.						
58	58.7	61	61	62	64.3	61.5
50	50	52	50	50	50	49
MEAN DAILY HUMIDITY.						
92	86.7	85	76	76.3	85.6	76
PREVAILING WIND.						
NE	W	W	W	W	W	W
WIND—MILES TRAVELED.						
83	73	237	150	135	142	106
STATE OF WEATHER.						
Foggy	Fair.	Fair.	Clear.	Clear.	Fair.	Foggy
RAINFALL IN TWENTY-FOUR HOURS.						

Total rain during the season, from July 1, 1878, 11.40 in.

Mining and Scientific Press Patent Agency.

Our U. S. and Foreign Patent Agency presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system and intimate acquaintance with the subjects of inventions in our new community. All worthy inventions patented through our Agency will have the benefit of a description or an illustration and explanation in the MINING AND SCIENTIFIC PRESS or the PACIFIC RURAL PRESS. We transact every branch of Patent business, and obtain Patents in all civilized countries. The large majority of U. S. and Foreign Patents granted to inventors on the Pacific Coast have been obtained through our Agency. The files of cases and official records in our office, our patent law and scientific library (already the largest west of the Mississippi), are constantly increasing. These facilities, with the accumulation of information of special importance to our home inventors, by the experience of its proprietors in an extensive and long continued personal practice, gives them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Office Wide Awake Prospecting and Mining Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

Summit Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fourth day of February, A. D., 1879, an assessment (No. 7) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the eleventh (11th) day of March, A. D., 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Tuesday, the eighth day of April, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine Street San Francisco, Cal.

To Consumers of High Explosives.

A card of the Vulcan Powder Company, published in yesterday's papers, requires notice from us, as the General Agents for the sale of Giant Powder on this Coast.

The Vulcan Company assert that miners obtain from them better Powder for less money than from this Company. The real fact is, that while they sell their Powder a few cents under our prices, their respective grades have always been very much inferior in strength and quality to the regular Giant Powder. This fact has been recognized by miners generally and has been shown to demonstration by careful tests, repeated from time to time with the most exact testing instruments, and in the presence of Mine Owners and Superintendents. The accuracy of these tests is beyond dispute. They have always shown so large a percentage of strength in Giant over Vulcan Powder, as to demonstrate that GIANT POWDER HAS INVARIABLY BEEN THE CHEAPER POWDER OF THE TWO.

So much for the flourish about benefiting the miners.

We will briefly notice what the Vulcan Card contains about the Giant Powder Company's Patent litigation. It says that a suit commenced in New York against Vulcan, in 1875, was withdrawn. True; that case was dismissed simply and entirely because it afterwards proved to be erroneous in form. As soon as the injunction was issued against the Vulcan by the U. S. Circuit Court of Massachusetts, (December, 1877,) preparations were made to commence proceedings in New York for obtaining a similar injunction there, but those proceedings were suspended, on account of the voluntary and summary closing up and abandoning the Vulcan Works, in New York, by the proprietor.

The Vulcan Company find it exceedingly easy, at this stage of affairs, to say they make Powder under this, that or any other patent; but on that particular point they may hereafter find that the Courts will have something to say entirely at variance with their ideas. However, the Giant Powder Company does not propose to try its Patent cases in the newspapers. It has now given to all parties distinct public notice as to its patent claims and rights, and for the present will there leave the matter.

BANDMANN, NEILSEN & CO.,
General Agents Giant Powder Company.

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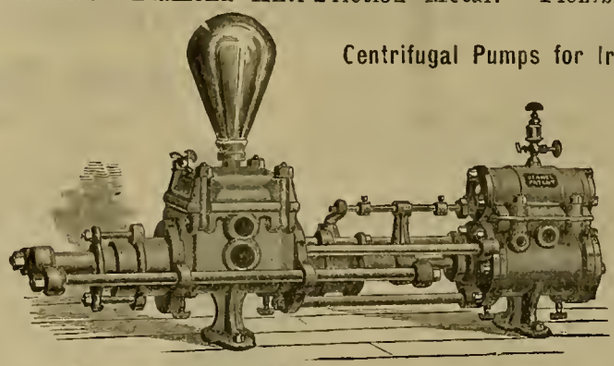

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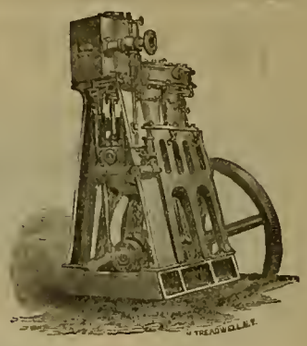

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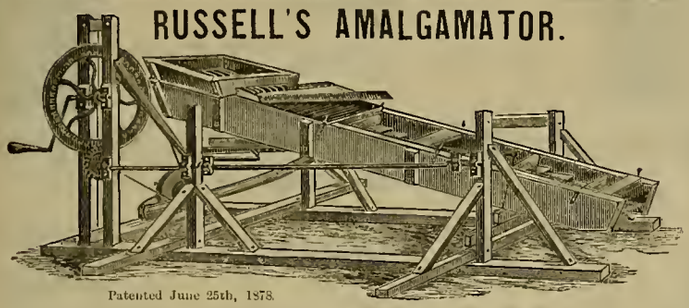

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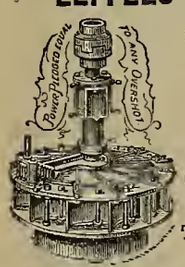

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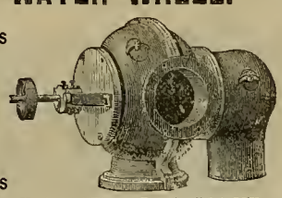

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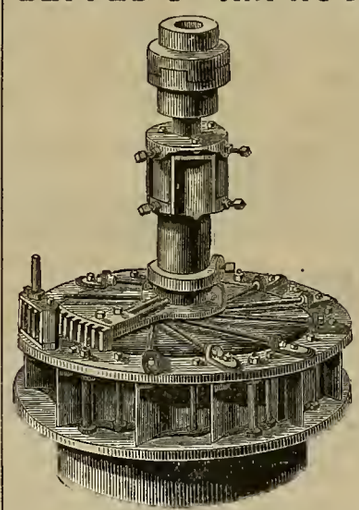

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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SAN FRANCISCO, SATURDAY, MARCH 8, 1879.

VOLUME XXXVIII Number 10.

Boiler Explosions—No. 1.

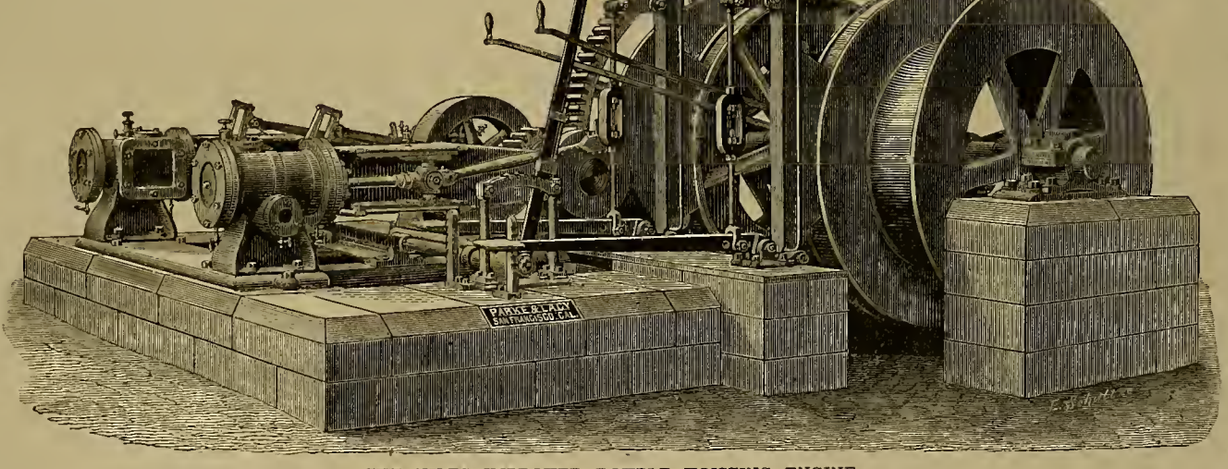
[Written for the PRESS by H. W. RICK.]

The exploding of portable and threshing engines is becoming of such frequent occurrence that people have just cause for fear at the manner these useful machines are handled by incompetent persons, as well as by those who are pronounced to be good engineers, but who have not made themselves masters of all the minute details which it is necessary to thoroughly understand. Very many of our best engineers and machinists who go out into the harvest fields to run threshing engines cannot repair a steam gauge, and when one is taken apart would not even know if it were out of order. The bursting of the boiler in Stockton, which caused such terrible results, could have been prevented by having had a new steam gauge on the boiler at the small cost of five dollars. The driver or engineer who had charge of this machine was considered to be one worthy of his calling. He had considerable experience both in the field and in the shop, but he may never have seen the inside of a steam gauge; at least he did not know that when the pointer of his gauge indicated only forty pounds that there was probably from two to three hundred pounds pressure upon his boilers. This explosion was not more terrific than others which have taken place near Stockton, and in other parts of the State within the last few years. A greater number of persons were killed from the fact that there were a greater number collected together, and it so happened that the heaviest part of the machine was thrown to where the greatest number were standing. This boiler was made of good material, the work of putting it together was well and strongly done, and it was capable of standing a pressure much greater than would ever be required to do any work which the engine was able to perform. It is apparent that it was exploded from great pressure, as the sheet, which is the under part of the furnace gave way, that being the weakest part of the boiler. This was an arched or crown sheet about two and one-half feet square. It did not collapse or cripple down as would be supposed but detached itself entirely from the parts which were held by stay-bolts, and was blown out of the furnace in the opposite direction from that taken by the heavier parts.

The part consisting of the boiler, engine flywheel, trucks, etc., was thrown to a distance of 100 or 150 feet, and the mass must have weighed, when it started, at least 6,000 pounds. It was shot through the air as a rocket is propelled, and is an illustration of what an immense power there is in steam when it is brought to such a fearful pressure. There is not a doubt but there was plenty of water in the boiler at the time, and that the boiler was clean and in good order. The safety valve beam was fastened down by a coil spring balance which did not have an index or register, and there was no way to ascertain by it that there was any extra heavy pressure. This is to say the least, a poor contrivance, and should never be used on any boiler.

While it is not wise to hold the engineer blameless, it is much more dangerous to believe what so many of the knowing ones say, when they tell us that they would have done this thing or that thing, and that they knew it all the time, etc. For instance, on the second day, after the accident, while standing near the place talking with engineers and eye-witnesses, an individual stepped forward and in a very excited manner said: "I stood right along side of her. I was looking right at her. I saw the sides of the boiler going in and pressing out, etc," How many times has this been said before by firemen or helpers around engines, and when will men cease to be so wise and skillful that they cannot learn anything?

One person made the remark that boys 14 years of age were allowed to run engines, and blamed the carelessness of engine owners. It may be remarked that it is much easier to keep boys from running engines, than it is to enlighten men who have arrived at the ripe age of 30 or 40 years, and are so wise that they would not learn of a boy, if the boy happened to know a great deal more than they do. There is a class of unskilled men who having been fireman or watermen for a short time only, will, for the sole purpose of getting a few dollars extra pay, recommend themselves, and, although they get through the season without accidents, it may be attributed to good luck rather than any knowledge which they possess. There are books and publications which are easily obtained at very small expense; besides, if a man wishes to become familiar with an engine, he could, by spending a little time, take one apart and put it together again, and even should he pay a competent mechanic to give him instructions, it would be much better than to be speedily sent to eternity, taking along so many others who are quite as unprepared and unwilling to go. We shall have more to say on this subject in another article.



THE NILES IMPROVED DOUBLE HOISTING ENGINE.

The Niles Double Hoisting Engine.

We illustrate herewith one of the Niles improved hoisting engines, designed specially for use on this coast, by Messrs. Parke & Lacy, agents. Several styles of this hoist are made, double with single drum, single with double drum, etc. The illustration represents one of the double engines with double drum, a very powerful and compact machine. They are in use at the Eureka Consolidated mine, Eureka, Nevada, the Guadalupe quicksilver mine, Raymond & Ely, Price & Davis, Hoosac, and other mines on the coast. The spur wheel and reels are made in sections, so they can be taken down small shafts and set up underground. All the gears are cut, which is a decided advantage. Some of the hoists of this style are now being built in sections, no piece weighing over 300 pounds, to be packed on mule back into the interior of Mexico.

The End of a Swindler.

Philip Arnold, one of the promoters of the successful diamond swindle perpetrated upon certain New York and San Francisco capitalists some six years ago, died recently at his home in Elizabethtown, Ky. We say successful, if the consummation of a scheme so nefarious can in any sense be called a success. Of Slack, his aider and abettor in this business, we have heard but little since he escaped with his share of the loot from this to the other side of the continent. Being a person of less shrewdness and thrift than his confederate in crime, he failed to invest his money wisely and, in fact, we believe soon lost the most of it, after which he subsided into his original obscurity. Arnold, however, having employed his capital to better purpose, had managed it seems to not only largely increase his original stock, but also succeeded in making himself quite popular in the neighborhood where he took up his abode. Being a banker and able to extend financial accommodations to the needy, and practicing an unbounded hospitality to all, his plausible version of the diamond affair was accepted by the people amongst whom he lived without much scrutiny; being generally regarded as a smart trick practiced upon a set of knaves who would have played the same on him had opportunity offered.

And so, Philip Arnold was held in tolerable repute in his old home; built himself a fine house, bought a farm and improved it highly; kept a stud of fast horses, and prospered in a way that seemed likely to falsify the old adage of honesty being the best policy, and other aphorisms of similar purport. But it didn't quite turn out that way in the end: our banker having gotten into a difficulty with a rival doing business in the same town, the trouble lead to a personal squabble that culminated in a shooting scrape, in which Arnold, after killing an innocent man with a shot aimed at his antagonist, was himself so badly hurt that he died from the effects of the wound soon after—died while yet a comparatively young man—died before he had hardly more than tasted the fruits of his ill-gotten gains; his reputation blasted and his memory burdened with that basest of all crimes, ingratitude to benefactors and perfidy to friends. It was a poor exchange, after all, that Philip Arnold made—this of bartering away the ever-conscious sense of integrity and a not dishonorable poverty, for an infamously acquired wealth.

However the inhabitants of this little Kentucky village, accepting his account of the affair as correct, might feel disposed to condone his offence, there is here, where the matter is better understood, but one opinion in regard to it; this community being quite unanimous in the belief that Messrs. Arnold and Slack were guilty of perpetrating a contemptable piece of villainy, for which they richly deserved to be sent to the State prison; and that they escaped expiating their crime by a long term of penal servitude, was simply because the men whom they had inveigled into this miserable business did not care to have their good names still more besmirched through a further connection with it.

This diamond swindle was not merely an immoral, but was in every aspect of the case a highly criminal procedure. It was even marked by such a disregard of pledged faith and the claims of friendship, as to many honorable minds is more abhorrent than crime itself. The parties to whose influence and exertions this scheme was mainly indebted for the small measure of success that attended it, were themselves grossly deceived and misled by the miscreats who originally planned it. Coming from the same section of the South and holding like social and political views with Arnold and Slack, they reposed the greatest confidence in their integrity and believed all they said. Hence the mischief, both they and such of their friends as they had induced to embark in the enterprise suffering heavy pecuniary loss and exposing themselves to the suspicion of being the authors and promoters of the fraud. Ignorant and unknown Arnold and his accomplice could, unaided by men of position and means, never have floated their scheme upon the public. The improbability of their pretended discovery would, but for the well known and reputable names of these parties, have invited such close scrutiny, as must have exploded the thing at the start. The expert sent to examine the "find" was thrown off his guard, and committed a blunder into which he would not otherwise have fallen.

Although they captured and got away with a considerable amount of money, the fate that seems to have overtaken this brace of rascals is not calculated to encourage to a numerous following in their footsteps; the one having been speedily dispossessed of his plunder, while the other, after enjoying his dishonest gains for a season, stains his hands with additional crimes and dies as the fool dieth, leaving some property and an unsavory reputation behind him. Of a truth the ancient but homely saying that "what comes over the devil's back is sure to go under his belly," seems in the case of these two men to have been amply verified.

METEOROLOGICAL SUMMARY FOR FEBRUARY.—The report of the United States Signal Service officer, of San Francisco, for the month of February is summarized as follows: The mean hight of barometer for the month was 30.126; mean temperature, 54.1; mean humidity, 79.2; prevailing winds, west; highest barometer, 30.420; lowest, 29.797; highest temperature, 70°; lowest, 43.5°; monthly range, 26.5°; greatest velocity of wind, 29 miles per hour; total number of miles traveled by wind, 4,471; total rainfall, 4.90 inches. Rainfall in February during former years: 1872, 6.90 inches: 1873, 3.94 inches; 1874, 2.21 inches; 1875, .32 inches; 1876, 4.92 inches; 1877, 1.18 inches; 1878, 12.52 inches.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Letter from Arizona.

Pioneer District—Slow Movements and their Causes.

EDITORS PRESS:—Although silver ore was discovered in this district several years ago, not until the past 18 months was anything effectual accomplished towards working the mines; and even the amount of exploration yet done is inconsiderable, in view of the encouraging surface indications met with in various parts of the district. It is only about eight months since there have been any facilities here for the reduction of custom ores, these facilities being still limited and inadequate to the requirements of the country. This slow progress has been caused not so much from a want of merit in the mines as by the peculiar customs that prevail among prospectors and other extraneous conditions,

The High Prices of Freights

Being one of the greatest obstacles to the mineral development and general advancement of the country. With the exception of breadstuffs, which are raised abundantly in the Gila and Salt River valleys, everything consumed here is brought from San Francisco, the average cost of through freight, having heretofore been eight cents per pound, and the time 40 days, is now diminished somewhat by the carrying forward of the railroad up the Gila. With this tax, which falls heavily on mining machinery in particular, it requires considerable capital and faith in the country to inaugurate operations of any magnitude. The present showing of the mines, however, would seem to warrant the requisite outlay, and two small mills, to be devoted chiefly to custom work, having been brought in here last summer, give prospectors and mines a chance to realize something at once. In the event of the completion of the Southern Pacific railroad as far as Maricopa Wells, the freight would be reduced nearly one-half, and the time to about 12 days.

"This Country Needs Capital."

Ever since the discovery of the precious metals, in this part of the Territory, the above has been the loud and incessant cry of claim-holders. Locations that could have been made to pay their own way from the beginning, have been permitted to lie idle while the owners exhausted their time and means in hunting for capital. The time was when men located mines for the purpose of working them on their merits, the strong and willing hand of the miner rarely failing then to wrest its reward from the wealth they contained; but times have changed, and with them men also. The spirit of speculation is rife among all classes, and the honest miner has not escaped its blight. He no longer looks upon his mine as the legitimate means of making money by the sweat of his brow, but as a thing created for the express purpose of being sold, and the "lucky miner" is now the one who gets the highest price for the poorest claim. This mania for selling mines gave rise to the countless fables of untold wealth found here on every hillside. These reports were persisted in and industriously circulated to attract the attention of capitalists, whose money was not so sorely needed for the development of the mines as to pay the big prices set upon them. The effect was to bring here a great influx of men of various classes. Many of them were indeed capitalists or their agents searching for investments, and these, for the most part, finding nothing approaching what they had been led to expect, condemned the whole thing without stopping long enough to learn the true value of the country.

The demand for "capitalists" was so great that every person arriving was sought out and interviewed the moment he reached any mining district; almost as soon as he entered the Territory. It was hard for the stranger to resist the temptation to assume the character of an Astor for an hour, thus thrust upon him, and many amusing incidents grew out of this tendency to cast a halo of millions around any beggar who might turn up. Even newspaper correspondents were sometimes through mistake wined and dined and whiskyed, and offered "the richest mine in the Territory" for a paltry hundred thousand. So many sharps at length began to assume the role of the capitalist that the business fell into disrepute, the proprietors of the hotels and bars having especially reason to remember these Arizona capitalists with loathing disgust, and to speak of them profanely.

Could the sale of mines have been effected as contemplated by the locator, the district would have gone ahead swimmingly. But they seemed to have lost sight of the fact that the same foresight and care that enable a man to accumulate money also prevents him from dishursing it for less than its equivalent. A location that might change hands among prospectors for the consideration of a sack of flour or a broken six-shooter, would be blandly offered to a moneyed man at $15,000 or $20,000, while claims having any silver in sight and a good vein cropping out would be held much higher. If a reasonable reduction of 98% were asked, the owner might be induced to lower the price one-half, he falsely arguing that a wealthy man could afford to pay any price for it. Here negotiations usually ended, wherefore comparatively few sales have been made, and those usually where the owners have been forced by circumstances to accept reasonable prices. To develop the mines of this district, would require but a comparatively small amount of capital—to purchase them would strain the resources of the Rothschilds. No great degree of prosperity can be looked for until the locators of these mines either go to work on them themselves or consent to terms which will enable others to do so.

Need for Some Further Congressional Legislation.

The only law recognized here in locating and holding claims is the Congressional act of 1872. This was no doubt passed and approved under the impression that the miners of the various districts would frame and adopt such further restrictive laws as circumstances might require. The mining lands being as much a part of the public domain as any other, they should be as jealously guarded against the wiles of the speculator and grabber. The law is very strict in regard to the amount of agricultural land which one person can locate and hold, the location of a second claim implying the desertion of the first. But it is silent in regard to the number of mining claims which one person can hold, the custom being, and the courts maintaining, that it is without limit. This is repugnant not only to the spirit of our government, but to common sense and justice, for it enables a few men who happen to come early into a mining region to lock up the treasures of a whole district and levy a sort of tribute or blackmail on those who come later. Nor is this the only defective feature of the law. It allows one year in which to perform $100 worth of work on a claim, or virtually gives a man the privilege of holding any amount of mining land for a whole year without making any improvements on it whatever, while the custom, which is to place the most liberal construction on the law, only aggravates the matter, by holding that if a man be on the ground with tools at the time the year expires, he may go on with the work and hold the claim for the second year. The loose customs which prevail here are, in fact, a great injury to the country and somewhat in conflict with the law. It is not considered necessary to mark the boundary of a location, as the law provides. Two or three small monuments with a single notice indicating the general directions of the lines are supposed to be enough, so that many claims are made lapping on each other. The clause which presumes that a mineral-bearing vein shall be discovered before it is claimed, is also entirely ignored, the rule being to claim the ground and take the chance of finding something on it afterward. The requirements of the law in this particular are very generally dodged. It is no uncommon thing for several prospectors, or more properly speaking speculators, holding a dozen claims, each to preconcert arrangements whereby they relocate each for the other when the time for doing the assessment work expires, the ground being afterward deeded back, and the law cheated of its rights for another year.

These loose ways, in general, are not only causing present trouble, but they are sowing the seeds of endless future litigation. Even now it is hardly safe to make a discovery of any value unless one is ready to defend it at law or by physical force. Now if Congress is going to legislate upon the subject at all, it should do so effectively. Miners, as a class, are averse to much law, and having a general one are loth to frame local codes, fearing conflicts and complications. Several attempts to organize district laws here have been defeated by the mistaken assertion that "the United States law is good enough."

If the benefit of the people at large is the object of law, it would seem that a stringent act of Congress properly enforced and correcting these and other flagrant abuses would meet the case. After reviewing all these obstacles which the district has had to contend against, enough it would seem to blight the progress of the most favored land, the wonder is that anything at all has been accomplished toward the legitimate operation of the mines. The outlook for the future, however, is at present better than ever before. There is a noticeable tendency on the part of miners to give up the delusive hope of selling out at fabulous prices and get down to the actual business of working their mines for the ore they will yield. And the want of capital, though there is room for more, is not so badly felt, now that there are milling facilities enough, at least, to keep the wolf from the door. ASSAYER.

Arizona, Feb. 18th, 1879.

Galvanizing Steam Boilers.

EDITORS PRESS:—I desire to call your attention to a suggested improvement, that, if properly carried out, might be of much public value. It is the galvanizing of steam boilers. I investigated the matter a few years since, and thinking it would be a great protection, in case of using salt or mineral waters (nearly always found in mining districts), made application for letters patent, which were refused on the ground of lack of novelty. The new application to steam boilers was the foundation of my claim.

I should like that some person would put this suggestion in practice and give it a fair test.

A. D. ROCK.

Eureka, Nev., Feb. 28th, 1879.

Old Fort Miller and Surroundings.

EDITORS PRESS:—The business travels of your correspondent in this region, have brought him to what was once an important point of the Upper San Joaquin river, where it begins its exit from the foothills of the Sierra Nevada mountains. I allude to the old Government station, known as Fort Miller, which was established in 1851, on the south bank of the stream. Blake, in his instructive and valuable work known as "The Geological Reconnoisance of California, etc.," prepared as one of the reports of Lieut. Williamson's expedition in 1853, gives a full description and a handsome engraving of the cove and surrounding mountains at this interesting point on one of California's two chief rivers. Judge Charles A. Hart, an old and respected citizen of Fresno county, owns the former

Site and Buildings

Of Fort Miller, and has there a valuable ranch and garden. As his home, he occupies with his family one of several well-constructed adobe buildings, which remain standing in an excellent state of preservation. There is not perhaps on this coast a finer sample of an adobe building than Judge Hart's. Its walls are about 30 inches thick, and it remains almost entirely unmarked by the earthquakes and storms through which it has passed during the last quarter of a century. The Judge took me through his garden, which, on the 7th of December, was in full cultivation: Chinese mustard, tomatoes, peppers, lettuce and other vegetables growing in luxuriance, still unnipped by the slightest frost. Yet heavy frosts had prevailed for more than a month throughout the San Joaquin valley westward of the foothills, and at a less elevation above the sea than is this cosy, picturesque nook, but a few miles above the broad, level plains. This fact known, your readers will not wonder that orange, lemon, almond, and fig trees, and choice grapevines, to say nothing of other fruit and nut trees, are growing most rankly and thriftily. Here the common red pepper is growing perennially, plants of it blooming and bearing year after year. For garden and orchard, irrigation is received from a spring, more than a mile distant, in the higher foothills.

This instance proves that

A Valuable Fruit Belt

Exists along the foothills of the Sierras in these southern counties, where frost is almost unknown, as is proved at Newcastle and other points for the corresponding parts of Sacramento valley. To utilize this truth, in Merced, Fresno, Tulare and Kern counties, only irrigation, industry and moderate means are requisite.

The site of old Fort Washington is found on the fine ranch of V. B. Cobb, seven or eight miles below Fort Miller, on quite a long stretch of bottom land, occupied by the valuable farms of the Birkhead Bros., W. J. McNeill, William Witt, Col. Lane, and others.

Half a mile below Fort Miller is the little that remains of Millerton—once the county seat of Fresno. The substantial brick Courthouse, with its jail basement of granite, remains standing, and is used as a school-house. But two white families live in this truly deserted village, the rest being given up to the numerous Chinamen, who are mining considerably along this part of the river, and for 30 miles above.

Two miles below Millerton, about half a mile below Converse's and Jones' old ferries—no longer kept up—is to be the head-gate of the

Upper San Joaquin Irrigation Canal Co.'s Canal,

To which allusion has already been made in your columns. Their camp has already been formed and work begun. Your readers will be farther informed of its future progress. This company which controls some 80,000 acres—to be irrigated eventually by this canal—offer a rare chance to industrious men of moderate means to work upon the ditch with their teams, be paid in company's stock, and afterwards if they wish, buy land and water rights for this script, which will be taken at its par value in payment for such land. This enterprise is affording a present home market for surplus hay and barley.

I must tell your readers of the most extensive and best sustained mining enterprise that has yet been attempted upon the gold-bearing gravel of the San Joaquin river.

In January, 1877, the

Kentucky Mining Co

Began the constuction of a mining ditch 14 miles long. It is now completed, with three miles of flumes. It also furnishes water for two other mines, along the San Joaquin and its tributaries, known as the Frieze and the Fine-Gold mines. Messrs. Hampton, Donahoo, Howard and Holt are among the chief stockholders, the former being Secretary, and Mr. E. F. Holt, Superintendent. Their ditch, as I am informed, runs from 250 to 300 inches of water—miners' measure—the supply never failing. Their method of work is entirely the hydraulic. Their works have cost up to this time $10,000 or $12,000.

Having spent some 18 months in the completion of their ditch, they began work about a month ago, and are well pleased with results. Their claim extends two miles along the river front, their present work being just opposite old Fort Miller. Their gravel varies in depth from 10 to 30 feet. They find considerable blue gravel, but most of it is granite, partaking of the nature of the vast masses of rock here and for many miles up the river. Mr. Holt assures me that they find this to be a first-class gold-bearing gravel deposit. He informs me that the mining enterprise in Fine-Gold gulch is also doing well, as are other mining projects in this district. You and your readers will be pleased to learn, that the mining as well as the farming interests of Fresno county are looking up—and surely these twin sisters of California's industry should always go hand in hand, if they do have family quarrels once in awhile.

J. W. A. W.

Fresno Co., Cal., Dec. 9th.

From the Comstock.

EDITORS PRESS:—The east shaft now being sunk in the Sierra Nevada mine from the 1700 to the 2200 level will, it is expected, be completed within a week. If the ore found farther south in that mine extends as far north as this shaft, the fact will most likely then be demonstrated. It may be, however, that the ore, though it extend that far north, will not be intersected by this shaft, in which case a crosscut will have to be run west from the bottom of the shaft to reach it. Should the ore be found to reach to this point, it will tend to show that it is a body of considerable dimensions, the distance thence south to the incline where ore is known to exist being about 500 feet. It is also known that ore extends from the 2100 level at the incline to the 2300 level, and presumably farther down. How far it extends south from the incline is not known.

Awaiting results of farther exploration there is much anxiety manifested among all classes. Meantime, gambling in the shares of this mine goes on actively, and should anything occur to send up the price of this stock, it will no doubt take up others in the immediate neighborhood with it. There is much need of bonanza developments here, as the old ones are being worked out. There are anticipations of important changes to take place in several of our mines for the better, and it is to be hoped that such will prove to be the case, as we stand in great need of a greater output of ore. The influence would be felt far and wide. The many mills that are standing still would be started up, and hundreds of idle mechanics and miners get employment, effecting a most desirable change in the affairs of this sage-brush community.

Several important connections have been made between shafts of different mines at quite a depth lately, much improving their ventilation, and more are about to be made, which will facilitate working in the lower levels, thereby affording opportunity to extend explorations in virgin ground, with good hope that ore may be found.

J. D.

Virginia City, Nevada, Feb. 25th, 1879.

M. TREUVELOT, a foreign scientific observer, has been experimenting with butterflies, in order to solve the disputed question as to the use of the antennæ. He found they could fly when deprived of the antennæ, but with some hesitation of movement. When blinded they did not perceive sugar by the antennæ; but if the stump were touched with it, the proboscis was at once unrolled and searched for it. M. Treuvelot concludes that the sense located in the antennæ is not merely that of touch, hearing or taste, nor a combination of all three.

A GOOD oil for gun-locks, etc., is said to be made in this way: Fill a phial three parts with almond oil, then fill up the remainder with clean lead chips. Keep the phial in a warm room and shake it now and then for a month, at the end of which time most of the mucilage and acid naturally in the oil will have combined with the lead, and thus be clarified and fit for lubricating gun-locks, reels and other similar work.

A NOVELTY IN FIREARMS.—A Spaniard, of Madrid, has invented a novelty in revolving firearms. It consists in the addition of a special chamber for receiving from the rear end of the cylinder, a portion of the gas resulting from the explosion of the cartridge, and conveying it to one of the discharged chambers to expel the empty shell.

THE State Engineer party, under Major Warfield, is now engaged in running levels in each direction, north, east, south and west, from Visalia, in order to ascertain the fall of the country. They are also collecting information in regard to ditches, amount of land irrigated, etc.

OCEAN TELEGRAPHY.—The application of the duplex system to several of the Atlantic cables, it is said, has effected an increase in their working capacity of fully 70%.

LAST year 3,606,465 cigars and 5,500 cigarettes were made in Maine, consuming 89,814 pounds of tobacco, while $20,832 worth of revenue stamps were used.

IN sinking a well 60 feet deep at Blackfoot, Snake river, gold was found every foot of the way down.

MECHANICAL PROGRESS.

Steam Engines to be Superseded.

When we reflect upon the enormous impulse given to civilization by the steam engine, the genius which has exhausted every resource to perfect it, its universal use, and the grandeur and subtlety of the physical laws upon which its usefulness depends, it is almost with a feeling of regret that we listen to the prediction of its becoming a thing of the past, to be read of by future generations as only one of the steps in a long chain of sequences by which the human mind has gradually become master of natural forces. Yet the man who of all men may claim the ability to forecast the future of the steam engine, whose eminent ability has been directed through a long and industrious life almost wholly to the investigation of the principles of steam power, thus prophesies.

We refer to Mr. John Bourne, in whose greatest, and perhaps final work, entitled "Steam, Air and Gas Engines," he uses the following remarkable language as part of the opening chapter:

"The present time is one of movement and apparently of impending revolution in the means of obtaining motive power. The steam engine having for nearly a century been the only efficient thermo-dynamic motor, and after having remained without any change in its principle or action, and even without any striking improvement in its details since it was dismissed from the hands of Watt, is now, I believe, on the eve of supercession by simpler and more economical machines. And, although among a host of competing contrivances, we cannot yet single out any one to which we should be warranted in doing homage as the prime move of the future, and although each an engine has probably yet to be invented, still there is no reason to doubt that it will before very long appear.

"The number and variety of the schemes which have been put forward for obtaining motive power from heat show very clearly the existence of a wide-spread perception of the enormous faults of the present steam engine, and of the exigent need which exists for the introduction of some better contrivance to take its place. To the creation of this sentiment I believe that I myself have in some measure contributed. In the first portion of my "Treatise on the Steam-Engine," published in 1844, I intimated the conviction that the steam engine would pass away; and in subsequent editions of that work, and also in other works, I have pointed out the radical defects of the steam engine as a thermo-dynamic motor, and have indicated the direction in which improvement must flow to obtain results of practical value. The great impulse, however, to the present movement for the supercession of the steam engine has been given by the discoveries of Mr. Joule, who, by a number of admirably-conducted experiments, has established the doctrine that a definite quantity of heat is the proper equivalent of a definite quantity of mechanical power; and as in the best engines it was found that not more than one-tenth of the power due to the heat was obtained, the inference was inevitable that the steam engine was a most wasteful machine, and ought to be superseded by some engine wherein the sources of loss did not exist."—*Scientific News.*

Grinding and Polishing Metal Surfaces by Hand.

There is no job the worker in metal is called on to do that requires the exercise of his brain and muscle in the proper direction than the grinding and polishing of metal surfaces on that class of work where machinery cannot aid him. The more he exercises his brain the more saving he will be of both his time and muscle. The practice generally employed by machinists in grinding and polishing either new or old work, was to mix the polishing material with oil, usually refuse machinery oil; in most cases this is a great mistake, and has caused the loss of time, patience and money. Take for instance the grinding to a true bearing of a stop-cock, a valve, seat, or a slide-valve.

There are a few machinists but what have had more or less of that class of work to do, particularly in jobbing shops, and we seldom find one who uses the same method of accomplishing the job that is practiced in shops where that class of work is made a specialty. In fitting and grinding in the plug into the barrel of a cock a little judgment and care will save a great deal of hard labor, and in no case should oil be mixed with any of the grinding material, for the following reasons: If fine emery, ground glass or sand are used with oil, it requires but a few turns of the plug in the barrel to break up the grains of the grinding material into very fine particles; the metal surfaces also grind off; the fine particles of metal mixing in with the grinding material and oil, making a thick paste of the mass. At this stage it is impossible to grind or bring the metal surfaces to a bearing, as the gluey paste keeps the metal apart; if more grinding stuff is applied it will prevent the operator from seeing what part of the barrel and plug bears the hardest. Again, if the grinding material be distributed over the whole surface, the parts that do not bear will grind off as fast as the parts that touch hard, as the particles work freely between the surfaces; should the barrel and plug bear equal all over, when fitted, it requires more care than if it were a top or bottom bearing, as that part of the barrel and plug across the "waterway" grinds twice as fast as the other parts; therefore it should be kept the driest. Now this objection holds good in the grinding of valve seats or slide valves, to wit: the separation of the surfaces of the metal by a thick, pasty grinding material. In order to bring the surfaces to a perfect bearing rapidly and with little labor, the following directions will be found worth a trial:

To grind a stop-cock of any kind first see that the plug fits the barrel, before it is taken from the lathe. Run a half-round smooth file up and down the barrel to break any rings that may be in it; a few rubs of a smooth file back and forth over the plug will break any rings or tool marks on it. Wipe both parts clean. Use for grinding material fine nicolder's sand sifted through a fine sieve. Mix with *water* in a cup, and apply a small quantity to the parts that bear the hardest. Turn rapidly, pressing gently every few turns; if the work is large and the lathe is used, run slow; press and pull back rapidly to prevent sticking and ringing; apply grinding sand and water until a bearing shows on another part; then use no more new sand, but spread the old that has worked out over the whole surface. Turn rapidly, pressing gently while turning; withdraw the plug and wipe part of the dirt off and rub on the place a little brown soap; moisten with water and press the surfaces together with all the force at hand, turning at the same time. Remove the plug and wipe both parts clean; next try the condition of the bearing by pressing the dry surfaces together with great force. If the parts have been kept together closely while grinding, and the plug has not rubbed against the lower part of the barrel, the surfaces will be found bright all over, and a perfect bearing obtained. If an iron barrel and brass plug are used, or two kinds of brass, a hard and soft metal, soap should be used freely when finishing up, as the tendency to form ringe is greater when two different metals are used.

In grinding a slide-valve which has been in use until hollow places have worn in the surface, emery mixed with water, or sand and water, will be found better than oil, unless a light body, such as kerosene, is used. If water is used with the grinding material soap should be rubbed on the hollow places, and the grinding stuff should be applied to the high parts in small quantities, keeping the low parts clean and dry until an even surface is obtained all over; then the worn-out stuff should be used for finishing up. In polishing metal, oil that will "gum up" should not be used with the polishing material, unless for a dead fine polish. In polishing old brass work which has been scratched and tarnished by wear, pumice-stone or bath brick should be used with soap and water for scouring off with, and rotten stone with kerosene for the wet finish, and dry for the final polish. The same method should be used for new brass work.

New work should require, when leaving the lathe and vise tools, but little polishing or grinding, and every good workman should try to avoid using an emery stick or emery cloth, for with proper care in the use of tools a great deal of grinding and polishing can be dispensed with.—*American Machinist.*

Paper bricks are the latest novelty. A manufactory of such bricks has recently been established in Wisconsin. The bricks are said to be exceedingly durable and moisture-proof. They are also larger than the clay article. Paper is now also used for making barrels. Straw pulp is run into a mold made in the shape of a half-barrel, cut vertically. The ends are of paper, but are protected by wood. The barrels are lighter and two-thirds cheaper than those of wood, and flour will not sift out of them while in transit. The staves are three-eighths of an inch thick.

Bessemer Steel Anchors.—It is stated that the British Admiralty have decided to adopt the use of anchors made of Bessemer steel, which can be had at less than one-half of the price paid for the costly "best" iron hitherto used; but it yet remains to be seen how far the quality will be the same. This extension of the area in which Bessemer steel is now used is likely to be of great value to the steelmakers, if the experiment prove successful, and to have important effects on the chain and anchor trades.

Mechanical Giants.—We recently made some notice of the construction of an 80-ton gun. The success attendant upon that enormous piece of ordnance, has encouraged the attempt to produce a 160-ton gun. As a necessity for such construction a lathe of enormous dimensions is now being built at the Woolwich arsenal. Another of the coming mechanical giants is a 1,000-ton revolving crane. There appears to be no limit, but cost, to the magnitude of mechanical constructions.

Metallic Packings.—J. Strieder, of Elberfeld, uses tubes of lead or some soft metallic alloy, filled with hemp, cotton or some other suitable vegetable material. These tubes can be prepared of great length and cut to fit any given requirement. The ends may be either soldered together or forced into close contact. The convenience, durability and cheapness of this packing are especial recommendations.—*Dingler's Pol. Jour.*

SCIENTIFIC PROGRESS.

Motion by Permanent Magnets.

When a large, very thin iron disk is placed horizontally, and made very easily movable upon a vertical axis passing through its center, it can be made to revolve by placing the opposite poles of magnets near its circumference, or by embracing it between the poles of a horseshoe magnet. All that is required is to heat the disk by a spirit-lamp at a point just beyond one of the poles; the rise of temperature will then diminish the attractive force of the magnet at this part of the disk, and this part consequently will turn from the magnet, its diminished attraction being overcome by the stronger attraction of the magnet on the cooler portion of the disk. When the diagonally opposite part is heated at the same time and in the same way, the motion is more rapid. It is evident that this motion can only be slow, as the varying parts of the disk can only be slowly warmed and cooled. This alternate warming and cooling could be promoted by placing pieces of ice under the disk, between the lamps and the pole toward which the disk is moving, the ice extending to the next pole, so as to keep the part to be attracted as cool as possible.

It will be seen that this motion is based on the principle that magnetic attraction is influenced by temperature, in such a way that it decreases by heat and increases by cold. It is well known that iron at about 1,000° entirely loses its property of being attracted by a magnet. Nickle loses it at 450°, and manganese at the common temperature, so that if cooled artificially it will be attracted. It is, therefore, likely that a plate of nickle would be better than one of iron, as it does not take as much heat to diminish its magnetism as it does that of iron. If, however, this advantage would not be counterbalanced by the fact that iron is attracted with more force than nickle, it is a question to be settled by experiment.

Ocean Currents.—Prof. Zoppritz, of Giessen, has investigated mathematically the question whether ocean currents are produced by the winds. One of the main objections urged against the theory that ocean currents are due to the impulse of the winds is that the winds can, it is alleged, produce only a surface drift, whereas many of the currents extend to great depths. Mr. James Croll, a high authority on this and kindred subjects, has always maintained that this objection is erroneous; that if the surface of the ocean be impelled forward with a constant velocity by the wind or by any other cause whatever, the layer immediately below will be dragged along with a constant velocity somewhat less. The layer underneath this second layer will in turn be also dragged along with a velocity less than the one above it. The same will take place in regard to each successive layer, the velocity of each being somewhat less than the one immediately above it, and greater than the one below it. In this manner the surface velocity may be transmitted downward to any depth. This conclusion has now been demonstrated by Prof. Zoppritz to be correct. The surface velocity is propagated downward, however, with extreme slowness. Thus it is found that for a mean depth of 4,000 metere it would require 100,000 years for the trade-winds to produce the existing equatorial currents.

Electro-Chemical Action Under Pressure. From a long series of experiments on electro-chemical action under pressure, varying from 100, 200 to 300 atmospheres and upward, M. Bouvet arrives at the following among other facts: The decomposition of water by a current is independent of pressure. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever the pressure. Oxygen and hydrogen, whatever the pressure, are liberated with equal facility. Whether they are produced in one test tube or in two, there are no secondary phenomena causing decomposition, even partial, as has been believed hitherto. When united in one test tube, even at a considerable pressure, and though forming a detonant mixture, they do not offer any danger in handling.

Hermann Herwig has extended his observations with a view of obtaining a nearer approximation to molecular distances in fluids. He concludes that no two molecular layers in water can be more than 1.86 of a millionth of a millimeter apart, and that the same is true with regard to the mean distances of adjacent molecular centers. Sir William Thompson had previously estimated the least value of the same distances at .05 millionths of a millimeter. The differences are thus as one to 37, which is probably as near as either of the figures to truth.

Darkness of Caverns.—The fact that the light of torches does not diffuse itself in a cavern is ascribed to the presence of a moldiness which covers their roofs and sides, and absorbs all those floating particles of dust which would otherwise act as reflectors.—*Les Mondes.*

Chemical Constitution of Wool.—P. Schutzenberger has published analyses of various samples of wool, from which he deduces the chemical formula $C_{230}H_{381}N_{70}O_{77}S_6$.—*Comptes Rendus.*

American Dinosaurs.—On the flanks of the Rocky mountains a narrow belt can be traced for several hundred miles, which is always marked by the bones of gigantic dinosaurs. The strata consist mainly of estuary deposits of shale and sandstone, and the horizon is clearly upper jurassic; the dinosaurian remains in this series of strata are mostly of enormous size, and indicate the largest land animals hitherto known. One new species (*Atlantosaurus immanis*) must have been at least 80 feet in length, and several others nearly equaled it in bulk. With these monsters occur the most diminutive dinosaurs yet found, one (*Nanosaurus*) not being larger than a cat. Some of these new forms differ so widely from typical dinosauria that Prof. Marsh has established a new sub-order to receive them, called *Sauropida*, from the general character of the feet. They are the least specialized forms of the order, and in some of their characters show such an approach to the mesozoic crocodilee as to suggest a common ancestry at no very remote period. In them the front and hind limbs are nearly equal in size; the feet are plantigrade, with five toes on each foot. The carpal and tarsal bones are distinct; the precandal vertebræ contain large, apparently pneumatic cavities; the sacral vertebræ do not exceed four, and each supports its own transverse process. The pubic bones unite in front by a ventral symphysis; the limb bones are solid. One of the species described and partly figured in Prof. Marsh's paper, in the *American Journal of Science and Arts*, for November, is called *Morosaurus grandis;* when alive it was about 40 feet in length; it walked on all four legs, was probably very sluggish in its movements, and had a brain proportionately smaller than any known vertebrate.

Electric Induction.—At a late meeting of the Royal Institution, Mr. J. E. H. Gordon, of the British Association, delivered a lecture on "Electric Induction," in which he remarked: As induction is not something merely passing through insulators, but has its seat in their particles, we might expect that different bodies would have different capacities for transmitting it, or, as it was called, would have different specific inductive capacities. Faraday was the first man who proved that this was the case, and who succeeded in measuring the ratios which the specific inductive capacities of various substances have to that of air, which is taken as unity. Having exhibited Faraday's apparatus, the lecturer pointed out the importance of accurate measurements, for it was only by a comparison of the electrical properties of bodies with their other physical properties that we could ever hope to arrive at the true theory of electricity. Mr. Gordon then stated that under Prof Clark Maxwell's advice, he had for three years been engaged on measurements of the specific inductive capacities of various substances. His new apparatus was exhibited in action on the table, and the specific inductive capacity of glass was determined before the audience. One important feature of the method was that, in order to avoid any permanent charging of the glass, the electrification was reversed 12,000 times per second. This was the first time that the new apparatus had been exhibited in London. As some parts of the machines were very minute, photographs of them were thrown on the screen by the electric light. A table of the results obtained was exhibited.

Minute Causes which Affect Explosions. A curious instance of the minute causes which sometimes affect explosions was given recently by St. Claire Deville, as observed by Prof. Abel. About .2 grain of chloride of nitrogen is placed in a watch glass and exploded with a piece of phosphorus; the noise is tremendous, but the explosion has little or no shattering effect. Now repeat the same experiment, after having breathed on the chloride so as to deposit a thin envelope of moisture (which cannot be more than a thousandth of a millimeter thick). In this case the explosion is less noisy, but the effects are quite different. Not only is the glass pulverized, but the table supporting it is perforated.

Nitrous Oxide Under Pressure.—P. Bert finds that by placing a patient in an apparatus where the pressure can be increased to two atmospheres, nitrous oxide can be administered so as to produce continued anæsthesis, while the blood receives its normal supply of oxygen and the normal conditions of respiration are maintained. From various experiments on animals, he thinks that gas administered in this way will be harmless, however much the insensibility may be prolonged.—*Comptes Rendus.*

Experiments with Aneroid Barometers.—The Giffard captive balloon, at Paris, was made to subserve some most interesting and useful scientific purposes during the French expedition. Among other things, it showed that all or nearly all the aneroid barometers, after registering the ascent, failed to record the difference in altitude until some time after they had been returned to the earth.

A New Variety of Coal.—The owners of the Dovenbury colliery, near Dearham, in the north of England, report the discovery of what appears to be a new variety of coal. It can be easily lighted with a candle, and burns with amazing rapidity and clearness, leaving behind scarcely any ash. They were offered a very high price for this coal for gas making.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 13.		Week Ending Feb. 20.		Week Ending Feb. 27.		Week Ending Mar. 6.	
Alpha	21	19	21	15¾	21	18½	20	17¼
Alta	8½	7⅝	7⅝	7	6⅞	5½	5⅞	6
Andes	80c	50c	50c	65c	60c	50c	50c	45c
Alps	....	....	....	....	....	....	....	....
Argenta	70c	55c	65c	60c	1	90c	1.40	1
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1½	1	1	....	1½	1	....	....
Belcher	8⅝	6½	8½	7½	7½	6½	6⅞	6
Belmont	50c	45c	55c	50c	50c	40c	50c	45c
Best & Belcher	26	24	25½	24	24	24½	20	17⅞
Bullion	9	8½	8⅝	7½	7⅞	6⅝	6½	4
Bechtel	80c	50c	70c	55c	75c	50c	85c	50c
Belle Isle	20c	....	30c	....	30c	....	35c	30c
Bodie	8⅞	7½	7½	2½	7⅞	6⅞	7	6
Benton	6	5⅜	5⅜	5	5	4.40	4½	3.90
Bulwer	18	16	18	16½	20	18	19½	17¼
Boyls	....	....	....	....	....	....	....	....
Black Hawk	65c	60c	1.05	65c	1.40	85c	2	1.40
Belvidere	45c	25c	1.40	80c	60c	40c	85c	50c
Booker	45c	40c	45c	55c	50c	40c	1	40c
Caledonia	3½	3	3.10	2.90	2⅞	2.55	3⅞	2
California	8	7⅞	7⅞	7⅝	7⅞	5⅝	6½	5⅝
Challenge	5¼	4	3.95	3	3.70	3	3	2⅞
Chollar-Potosi	49⅞	48	49½	48	49	46	46	39½
Comanche	....	....	....	....	....	....	....	....
Confidence	23	17⅞	17½	15½	16½	14	14½	12½
Con Imperial	1.35	1.20	1.35	1.05	1.30	1.15	1.15	1
Con Virginia	8	7½	7⅝	7¼	7½	5⅞	6½	5⅞
Crown Point	6⅝	5⅞	6½	6	5⅝	4¼	5¼	4.40
Con Washoe	....	....	....	....	....	....	....	....
Champion	....	....	....	....	10c	....	45c	25c
Concordia	....	....	....	....	....	....	25c	15c
Dayton	50c	....	50c	....	....	....	50c	....
DeFrees	15c	10c	10c	....	10c	....	5c	....
Daney	....	....	....	....	....	....	....	....
Day	40c	30c	35c	30c	30c	....	30c	25c
Eureka Con	30¾	29¾	30	29¾	29	27½	29	27½
Exchequer	7½	6½	7	6	7½	5⅛	5½	4.80
Endowment	25c	10c	20	15	15c	5c	10c	5c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	6	4.60	5⅞	5	6	4.60	4.80	4½
Gila	5c	....	5c	....	30c	5c	30c	25c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	5½	....	13	5½	10	9	10	9
Goodshaw	45c	25c	50c	45c	50c	....	60c	45c
Gould & Curry	15¼	14½	14⅞	13⅞	13⅞	11⅞	11½	9½
Hale & Norcross	21¼	18⅞	18⅞	17	17½	15⅞	16½	14½
Hillside	2¼	2⅝	2¼	2	2.65	2.40	2.60	2¼
Highbridge	1.40	1¼	1¼	1	80c	60c	75c	55c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	15c	10c	30c	25c	20c	....
Independence	1.80	1½	2	1.80	1.80	1⅞	1.60	1.35
Julia	4½	4¼	4.20	3.90	5⅞	5⅛	5⅞	4.60
Justice	5⅝	4	5½	5⅛	5½	4	4½	4
Jackson	7	6½	7¼	6	7¼	7	7½	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	8	6½	6¼	5⅞	5⅞	4¼	5⅞	4½
Kossuth	25c	10c	20c	15c	25c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	2	1.20	1.90	1½	1.95	1⅞	1.65	1
Lady Wash	2½	1.80	1.90	1.60	1.70	1¼	1.45	1
Leopard	90c	85c	1	90c	85c	50c	85c	70c
Leviathan	75c	50c	65c	55c	65c	50c	50c	40c
Leeds	80c	50c	80c	75c	1	60c	1	70c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	10c	....	....	....	....	....
Modoc	....	....	....	....	10c	5c	10c	....
Manhattan	3¼	3	3	2½	2.90	2½	2½	1½
Martin White	6½	5½	5	....	6	5⅞	7	6
McClinton	60c	....	85c	40c	75c	60c	90c	75c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	40½	37½	40⅞	38½	47½	39½	43	37⅞
Mides	....	....	....	....	....	....	1½	....
Morning Star	3	2½	....	....	....	....	3	....
North Con Virginia	11½	8½	11¼	9	14⅞	10	12½	10½
New York	1.10	85c	85c	60c	65c	45c	50c	30c
Northern Belle	8½	7⅞	10	9	10	8	9½	9
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	....	25c	20c	20c	15c	20c	15c
Occidental	....	....	....	....	....	....	....	....
Ophir	42	34½	42	39¼	43½	40	41½	35½
Oriental	50c	40c	5c	....	20c	15c	15c	5c
Overman	12	11⅞	12	11	10⅞	9½	12⅞	10⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	2	....
Phil Sheridan	35c	25c	30c	25c	50c	40c	45c	25c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	8	6	6½	6⅛	6¼	5	6	5
Richer	60c	....	65c	....	1	....	1	75c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17	15⅞	15⅞	14	13⅞	13	13½	11⅛
Seg Belcher	24½	23	25	24	27	....	....	....
Sierra Nevada	49	40½	49	46½	57	47⅞	48⅞	45
Silver Hill	2.90	2⅜	2.70	2.40	2½	2	2⅜	1.95
Silver King	19	....	9½	9¼	10	9¼	8⅝	....
Silver Prize	....	....	....	....	10c	....	....	....
Succor	1¼	1	1	65c	60c	45c	50c	30c
Summit	2¼	1.95	2.65	2.15	3¼	2.30	3	2.15
Scorpion	1⅞	1.60	1.60	1.40	1.70	1½	1½	1
Solid Silver	70c	65c	60c	55c	60c	55c	65c	40c
South Bodie	25c	....	30c	....	30c	....	30c	....
South Standard	....	....	....	....	....	....	....	....
Star	95c	75c	75c	....	75c	70c	60c	....
St. Louis	50c	....	....	....	50c	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1.78	1½	1.70	1.40	1⅞	1½	1⅞	1.40
Tiptop	1.45	1	1¼	90c	1	90c	90c	70c
Trojan	45c	35c	35c	25c	30c	25c	50c	25c
Union Con	62	61	68	61	90	67½	76	68
Utah	19½	17⅞	18	16	20	16¼	17	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.30	85c	1.40	1.20	2.05	1.35	1.55	1.20
Wells-Fargo	20c	15c	20c	15c	15c	....	20c	15c
Woodville	30c	....	....	....	25c	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	27½	21⅞	22½	20½	22½	20	19	17

Sales at S. F. Stock Exchange.

Friday A. M., Feb. 28.
280 Andes.....50c
785 Alta.....5½@5⅞
125 Alpha.....19⅞@20
505 Best & Belcher..19⅞@19⅞
650 Bullion.....6¼@6⅛
240 Belcher.....6⅞
685 Benton.....4½@4
970 California.....6½@5⅞
315 Crown Point.....4⅞
1020 Con Imperial..1.15@1.10
880 Caledonia.....2½@2.60
150 Con Dorado.....20c
30 Confidence.....14@13⅞
200 Challenge.....3@2.90
15 Chollar.....46@45½
735 Dardanelles.....3.10@3½
555 Exchequer.....5⅞@5½
1230 Flowery.....30@40c
545 Gould & Curry.....11½
225 Hale & Nor.....15½@16
365 Justice.....4.40@4¼
740 Julia.....5¼@5⅞
135 Kentuck.....4⅞
525 Lady Bryan....1.60@1.65
50 Lady Wash.....1½@1.45
475 Leviathan.....50@45c
350 Mides.....1¼
585 Mexican.....43@42½
250 Mackey.....3½@3.65
185 North Con Vir...12⅞@12½
235 N Bonanza.....1.80
200 N Sierra Nevada.....5c
200 New York.....50c
90 Overman.....12@12⅞
175 Ophir.....40½@39⅞
150 Phil Sheridan.....45c
200 Plutus.....1.40
170 Sierra Nevada...48½@48⅞
150 Savage.....13½@13⅝
100 S Potosi.....2
1085 Silver Hill.....1.95@2
500 Senator.....20c
1250 Solid Silver.....60@65c
650 Succor.....40@50c
100 Scorpion.....1.40@1½
300 Santiago.....2⅞
150 Trojan.....25c
120 Utah.....17
200 Union Con.....78@77⅞
450 Wells-Fargo.....15c
1365 Ward.....1.45@1.55
450 Yellow Jacket.....18½@19

AFTERNOON SESSION.
1920 Argenta.....1.15@1¼
100 Albion.....40c
575 Bechtel.....70@50c
535 Bodie.....6@6⅞
200 Belvidere.....85@75c
205 Bulwer.....19½
2455 Black Hawk.....2@1.80
200 Belle Isle.....30c
300 Booker.....40c
450 Concordia.....15c
870 C Pacific.....2½@2
150 Caledonia (B H).....2¼
1050 Chieftain.....15c
700 Dudley.....70c
50 Day.....30c
35 Eureka Con.....29
1825 Esmeralda.....1@1.20
535 Goodshaw.....50@60c
110 Grand Prize...4.70@4.80
200 Golden Terra.....9@9⅞
100 Giant & O A.....5½
300 Hamburg.....50@40c
135 Hussey.....20c
160 Hillside.....2½@2¼
1000 Highbridge.....60c
475 Independence...1.60@1½
125 Jackson.....7¼
125 Leopard.....70c
500 Leeds.....1
970 McClinton.....75@80c
100 Minnietta Belle.....30c
760 Mono.....3@3.20
150 Manhattan.....2⅞@2½
490 Northern Belle.....9
2375 Navajo.....15c
100 Oriental.....15c
875 Paradise.....2@1.95
100 Phenix.....2
480 Raymond & Ely.....5
500 Red Cloud.....2½
150 Richer.....1
100 Real del Monte.....3
20 Star.....60c
300 S Bodie.....30c
410 Summit.....3
1920 S Bulwer.....90c@1
100 Tiptop.....90c
2000 Tuscarora.....5c
775 Tioga Con.....1⅞
150 University.....1

Saturday A. M., Mar. 1.
140 Alpha.....18
370 Alta.....5⅞@5⅝
50 Andes.....45c
50 Albion.....40c
1710 Argenta.....1.40@1.35
550 Best & Belcher...20@19⅞
300 Belcher.....6⅞
5020 Bullion.....5@4
725 Booker.....1@80c
280 Bodie.....6⅞@7
980 Benton.....4½@4
220 Bulwer.....19@19½
50 Belvidere.....85c
200 Bechtel.....70@65c
1575 Black Hawk...1.40@1.60
100 Concordia.....20c
3750 Con Esmeralda.....1@1¼
275 Con Virginia.....5⅞@5⅞
665 California.....6½@6
310 Confidence.....13
85 Chollar.....45@45½
430 Crown Point.....4.55@4⅞
790 Con Imperial..1.05@1.10
365 Challenge.....2.55@2½
1170 Caledonia.....2⅞
310 C Pacific.....2.10@2
100 Chieftain.....15c
50 Dayton.....50c
525 Dardanelles.....2⅞@2.60
100 DeFrees.....5c
100 Dudley.....90c
1700 Exchequer.....4.90@5
780 Endowment.....10c
200 Flowery.....85c
480 Gould & Curry....11½@11
55 Grand Prize.....4.60
500 Goodshaw.....60c
130 H & Norcross.....16½@16
200 Highbridge.....55c
40 Hillside.....2.30
250 Independence.....1.60
295 Justice.....4.30@4¼
730 Julia.....5½@5¼
290 Jackson.....7⅞@7½
200 Kentuck.....4½@5
445 Leviathan.....50@45c
750 L Bryan.....1.60@1½
220 Leopard.....85c
380 Lady Wash.....1¼
50 Leeds.....70c
1290 Mexican.....41@40
200 Mackey.....3.60
60 Manhattan.....2¼
350 Mono.....3@3.10
300 McClinton.....80c
750 N Sierra Nev.....10c
500 Navajo.....15c
345 N Con Virginia..11⅞@11½
220 N Bonanza.....1.85
60 Northern Belle.....9
630 Ophir.....38@38½
490 Overman.....11⅞@11¼
100 Oriental.....5c
100 Phil Sheridan.....40c
345 Paradise.....2
300 Raymond & E.....5
370 Real del Monte.....3
175 Red Cloud.....1½
280 Savage.....13½@13⅞
400 Succor.....45@40c
530 Sierra Nevada.....47@45
330 Silver Hill.....2.10@2.15
400 Solid Silver.....60c
320 Scorpion.....1.40@1½
200 S Potosi.....2@2.05
230 S Bulwer.....90@80c
300 South Bodie.....30c
480 Summit.....2.90@3
700 Trojan.....26c
100 Tiptop.....85c
175 Tioga.....1.70@1⅞
505 Union Con.....75@72
140 Utah.....15⅞@16
600 University.....1
1720 Ward.....1.45@1.35
100 Wells-Fargo.....15c
530 Yellow Jacket...17½@17⅞

Monday A. M., Mar. 3.
530 Alta.....5½
10 Alpha.....18
150 Andes.....4?@50c
500 Best & Belcher.....20
690 Belcher.....6½@6
4445 Bullion.....5⅝@5
165 Benton.....4@3.90
30 Chollar.....45@44½
860 California.....6
610 Con Virginia.....6@6½
285 Crown Point.....5½@5⅞
1950 Con Imperial.....1.05
250 C Dorado.....5@10c
275 Challenge.....2.80@2⅞
100 Caledonia.....2
190 Confidence.....14@14½
715 Dardanelles.....2.20@2½
1465 Exchequer.....5¼@5⅜
400 Flowery.....75@85c
200 Geo Douglas.....50c
515 Gould & Curry...11⅞@11½
450 Hale & Nor.....16@15⅞
220 Justice.....4¼
620 Julia.....5@5¼
170 Kentuck.....5⅜
1400 Lady Bryan.....1@1¼
295 Leviathan.....50c
760 Mexican.....40½@40
300 Mackey.....3.60
365 North Con Vir....11@10⅞
1530 N Bonanza.....1.80@1¾
435 New York.....40@30c
400 Ophir.....38@37½
150 Overman.....11@11⅛
685 Phil Sheridan.....40@35c
1100 Solid Silver.....55@50c
815 Savage.....13⅞@13½
430 Sierra Nevada.....46@45½
1150 Silver Hill.....2¼@2.10
100 S Potosi.....2.05
400 Succor.....40c
100 St Louis.....40c
100 Senator.....20c
125 Utah.....15½@15¼
495 Union Con.....72½@71
200 Wells-Fargo.....15c
700 Ward.....1.35@1¼
420 Yellow Jacket....18@18⅛

AFTERNOON SESSION.
800 Argenta.....1.30@1.15
100 Belmont.....50c
850 Belle Isle.....30c
110 Bodie.....6⅞@7
950 Bechtel.....60@85c
1100 Booker.....90@80c
700 Belvidere.....60@50c
100 Bulwer.....19
1800 Black Hawk.....1⅞@2
650 Champion.....40@30c
100 Concordia.....25c
1100 Caledonia (B H).....2½
880 Con Pacific.....2
100 Day.....25c
100 Dudley.....90c
350 DeFrees.....5c
150 Endowment.....10c
1200 Esmeralda.....1
260 Grand Prize.....4½@4.60
425 Gila.....30@25c
1085 Goodshaw.....50@60c
260 Giant & O A.....5¼
100 Golden Terra.....10
100 Hamburg.....25c
600 Highbridge.....60@55c
240 Independence....1½@1.40
115 Jackson.....7½@7
700 Leopard.....80@85c
50 Minnietta Bell.....30c
1010 Manhattan.....2¼@2
400 Mono.....2½@3.40
1250 McClinton.....75@85c
310 Martin White.....6
310 Northern Belle.....9
650 Navajo.....15c
600 Paradise.....1.90@1.95
100 Real del Monte.....2
105 Standard.....18@20
100 Star.....60c
350 S Bodie.....30c
1400 S Bulwer.....75@85c
750 Summit.....2.15@2¼
100 Silver King.....8¾
300 Tioga Con.....1.55@1½

Tuesday A. M., Mar. 4.
825 Alta.....5¼@5
70 Alpha.....17⅞@17½
130 Andes.....45@50c
320 Best & Belcher...18½@18⅞
1930 Belcher.....6¼@6⅝
1350 Bullion.....5⅛@5⅝
445 Benton.....3.90
650 California.....6⅞@5⅝
230 Caledonia.....2.55@2.60
720 Con Virginia.....5⅝@5⅞
1970 Con Imperial.....1.05@1
125 Chollar.....40
730 Crown Point.....4½@4.40
295 Confidence.....13@12½
350 Challenge.....2⅞@2.60
685 Dardanelles.....2.10
795 Exchequer.....4.85
580 Flowery.....75c
420 Gould & Curry...10¼@10½
855 H & Norcross....15½@15⅝
350 Justice.....4@4.05
1080 Julia.....4.65@4⅞
40 Kentuck.....4⅞@4½
250 Lady Bryan....1.40@1.35
300 Lady Wash.....1.15
550 Leviathan.....40c
555 Mexican.....37⅞@38⅞
50 Mackey.....3.60
300 New York.....35@40c
175 North Con Vir....10½@10⅞
410 N Bonanza.....1⅞@1.60
250 Ophir.....35⅞
145 Overman.....10⅞@10⅝
450 Phil Sheridan.....40c
1100 S Potosi.....2.05
195 Sierra Nevada....46@46½
360 Savage.....12⅞@12¼
400 Silver Hill.....2.10@2.05
500 Succor.....30c
610 Solid Silver.....50@40c
700 Trojan.....25@50c
140 Utah.....14@13½
130 Union Con.....68@69
700 Wells-Fargo.....15@20c
950 Ward.....1¼@1.20
330 Yellow Jacket....7½@17⅞

AFTERNOON SESSION.
160 Adenda.....1
1430 Argenta.....1.20@1.15
675 Booker.....70@60c
1100 Belle Isle.....35c
90 Bodie.....6⅞
400 Bechtel.....60c
700 Belvidere.....60c
110 Bulwer.....18⅞@18½
155 Belmont.....45c
1410 Black Hawk...1.60@1.70
200 Champion.....30c
200 Concordia.....25c
175 C Pacific.....2
450 Caledonia (B H).....2½
100 Chieftain.....15c
200 Dudley.....80@75c
315 Eureka Con.....27½
300 Esmeralda.....1
665 Giant & O A.....5
560 Goodshaw.....50c
370 Grand Prize.....4½@4.65
290 Golden Terra.....10@9½
560 Highbridge.....60@75c
720 Independence....1½@1.45
20 Jackson.....7½
290 Leopard.....85c
40 Leeds.....75c
460 Mono.....2½@2¼
300 McClinton.....90c
330 Modoc.....10c
270 Manhattan.....1⅞
300 M White.....7
100 Northern Belle.....9¼
900 Navajo.....15c
575 Paradise.....1.90@1.80
105 Raymond & Ely.....5½
35 Star.....60c
400 S Bodie.....30c
515 Summit.....2¼@2.40
8.0 S Bulwer.....70@80c
340 Tiptop.....80@75c
150 Tioga Con.....1.60

Wed'sday A. M., Mar. 5.
50 Andes.....45c
170 Alpha.....17½@17¼
195 Alta.....5⅛
665 B & Belcher.....17⅞@18
1015 Bullion.....5½@5¼
880 Belcher.....6⅛@6⅝
535 Benton.....4@4.20
160 Chollar.....40½@39½
485 Con Virginia.....5⅞@5⅛
870 California.....5⅛
430 Crown Point...4.95@4.80
265 Caledonia.....2⅞@2.65
980 Con Imperial.....1.05@1
280 Confidence.....13½@13⅞
80 Challenge.....2⅝@2.65
335 Dardanelles.....2@2.05
150 Exchequer.....4.80
50 Flowery.....85c
1370 Gould & Curry.....9⅞@9½
1125 Hale & Nor.....14½@14⅞
510 Justice.....4.20@4.10
950 Julia.....4.65@4⅞
200 Kentuck.....4⅞@5
375 Leviathan.....40c
1195 Lady Bryan....1.15@1.10
25 Lady Wash.....1
265 Mexican.....37⅞@38½
100 Mackey.....3.65
110 North Con Vir...11@10⅞
100 New York.....35@40c
90 N Bonanza.....1⅞
365 Overman.....11@11¼
305 Ophir.....35⅞@35½
50 Phil Sheridan.....40c
600 Succor.....45c
790 Savage.....11⅞@11½
240 S Nevada.....45@45½
1200 Solid Silver.....50c
795 Silver Hill.....2.10@2.05
75 Scorpion.....1¼@1
100 S Potosi.....2.05
400 Trojan.....25c
70 Utah.....13½
290 Union.....68@68⅞
200 Woodville.....25c
200 Wells-Fargo.....15c
285 Ward.....1¼
900 Yellow Jacket....17⅞@17

AFTERNOON SESSION.
800 Albion.....30@25c
210 Argenta.....1.05@1
205 Bulwer.....18⅞@17½
415 Bechtel.....65@55c
170 Bodie.....6½@6⅝
350 Belvidere.....60c
540 Black Hawk.....1.60
250 Belmont.....45c
650 Belle Isle.....35c
1260 Booker.....50@55c
350 Champion.....30@25c
140 Caledonia (B H).....2.35
400 C Pacific.....1
100 Dudley.....75c
50 Eureka Con.....27½
1000 Endowment.....5c
180 Grand Prize...4.55@4.60
600 Goodshaw.....45c
1000 Giant & O A.....5
845 Highbridge.....65@75c
200 Hillside.....2¼@2.60
110 Independence...1½@1.35
300 Jefferson.....2
210 Leopard.....85c
300 McClinton.....80@75c
470 Manhattan.....1⅞@1½
100 M White.....7@6⅞
350 Mono.....2@2.10
200 Northern Belle.....9½
710 Navajo.....15@20c
1100 Paradise.....1½@1.40
250 Raymond & Ely....5½@6
100 Richer.....75c
350 S Bodie.....30c
290 Summit.....2¼@2.35
250 S Bulwer.....80c
2100 Tiptop.....70@75c
975 Tioga Con.....1.40@1½
3025 Tuscarora.....15@5c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery s
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3	20	Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Goodshaw M Co	California	21	10	Jan 10	Feb 20	Mar 10	Victor Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
Mayhelle Con M Co	California	2	10	Jan 21	Mar 12	Mar 14	G A Holden	301 Pine st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
North Con Virginia M Co	Nevada	15	1 00	Jan 18	Feb 21	Mar 13	G C Pratt	309 Montgomery st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Raymond & Ely M Co	Nevada	10	1 00	Jan 7	Feb 12	Mar 10	J W Pew	310 Pine st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Ward G & S M Co	California	3	30	Jan 10	Feb 14	Mar 6	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Advance S M Co	California	2	50	Dec 19	——	Mar 14	B Lingley	309 California st
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Mar 20	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 21	Wm A Van VanBokkelen	309 Cal
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 17	Apr 2	J T McGooghegan	318 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 17	Feb 24	Mar 14	N O Walton	324 Pine st
Hanover Con M Co	California	2	25	Jan 30	——	Mar 24	Wm A Andoe	327 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Ross	302 Montgomery st
MariposaLand & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mayflower Gravel M Co	California	3	10	Jan 15	Feb 20	Mar 12	J Morizio	328 Montgomery st
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 16	D L Thomas	203 Bush st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Apr 9	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Taul	328 Montgomery st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
University G M Co	California	1	10	Mar 1	Apr 6	Apr 26	Wm Letts Oliver	328 Montgm'y st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ætna M Co	Arizona	J S Benear	420 Montgomery st	Annual	Mar 24
Centras Con M Co		W W Parrish	328 Montgomery st	Annual	Mar 11
Equitable T & M Co	F	Charles J Collins	227 Montgomery st	Annual	Mar 21
Northern King M & M Co	Arizona	J F Glover	318 Pine st	Special	Mar 13
Hale & Norcross S M Co	Nevada	J F Lightner	N W cor Pine & Montg'y	Annual	Mar 12
Slavonia G & S M Co	Nevada	A F Martin	525 Front st	Annual	Mar 11
South Utah M Co	Nevada	Chas S Healy	Merchants' Ex	Special	Mar 12

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Feb 20
Golden Star M Co	Arizona	J W Morgan	318 Pine st	25	Dec 9
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Feb 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Feb. 27.
255 Alta.....5½
100 Andes.....50c
210 Alpha.....18¼
190 Best & Belcher.....20¼
900 Belcher.....6⅞@6¼
2130 Bullion.....6⅞@6⅞
1060 Benton.....4½@4.40
615 California.....6½@6⅞
550 Con Virginia.....6⅞@6¼
285 Crown Point.....5@4¼
30 Chollar.....46
2790 Con Imperial.....1.15
245 Confidence.....14
1455 Caledonia.....2.60@2.55
355 Challenge.....3@3.10
1185 Dardanelles.....3@3.05
1885 Exchequer.....5⅞@5⅛
1020 Flowery.....40@35c
155 Gould & Curry...12½@11⅞
405 Hale & Nor.....15⅞@15⅞
390 Justice.....4¼@4
900 Julia.....5½
95 Kentuck.....5@4⅞
100 Kossuth.....25c
185 Lady Wash.....1¼
1005 Lady Bryan....1.70@1.60
1050 Leviathan.....50@60c
480 Mexican.....44½@44
80 Mackey.....3½
890 New York.....50@45c
485 North Con Vir....13@12⅞
755 N Bonanza.....1⅞@1.90
100 Ophir.....41@40⅞
550 Overman.....9⅞@9½
1475 Phil Sheridan....45@40c
100 Plutus.....1.30
305 Sierra Nevada....50¼@50
585 Savage.....13¼@13⅛
1000 Succor.....45c
595 Silver Hill.....2
530 Scorpion.....1.55@1.60
1330 Solid Silver.....60c
300 Santiago.....2½
450 Trojan.....30@25c
175 Union Con.....80@79½
10 Utah.....17¼
1150 Ward.....1.60@1½
1050 Yellow Jacket...19⅞@19½

AFTERNOON SESSION.
1150 Argenta.....1@1.10
300 Albion.....50@75c
300 Belle Isle.....25@30c
25 Bulwer.....19½@19⅞
490 Bodie.....6@6½
300 Bechtel.....65@70c
100 Belmont.....40c
300 Belvidere.....70@75c
2675 Black Hawk.....2@2½
300 Booker.....70@75c
350 C Pacific.....2.10@2.15
100 Caledonia (B H).....2½
150 Chieftain.....15c
250 Concordia.....10c
100 Dudley.....70c
100 DeFrees.....10c
300 Endowment.....10c
1450 Esmeralda.....1@1.22
400 Goodshaw.....45@50c
190 Grand Prize.....4.70@5
400 Golden Terra.....10
100 Giant & O A.....5
300 Hussey.....20@25c
20 Hamburg.....50c
100 Highbridge.....60c
50 Hillside.....2.30@2.40
50 Independence.....1⅞
55 Jackson.....7½@7⅛
620 Leopard.....55@60c
40 Martin White.....6
360 Mono.....3
245 Manhattan.....2⅞
700 McClinton.....70@75c
50 Minnietta Bell.....30c
24 Modoc.....5c
240 Northern Belle.....9¼
100 Oriental.....15c
350 Paradise.....2.15@2.20
230 Richer.....1
25 Silver King.....9½
532 S Bulwer.....1@1.10
290 S Bodie.....30c
200 Star.....60c
1590 Summit.....3@3¼
400 Tuscarora.....10c
470 Tioga Con.....1.70@1⅞
145 Tiptop.....90c
50 University.....75c

Thursday A. M., Mar. 6.
155 Alta.....5½@5¼
80 Alpha.....17½@18
290 Andes.....45@50c
165 Best & Belcher..18½@18¼
700 Bullion.....5⅞
1290 Belcher.....6⅞@6½
320 Benton.....4.10@4¼
475 Caledonia.....2⅞@2.70
1660 Con Imperial.....1@1.05
160 Chollar.....39½
250 C Dorado.....10c
185 California.....5⅞
275 Challenge.....2½@2.65
235 Con Virginia.....5⅞
180 Confidence.....13¼
450 Crown Point.....4⅞@4.80
175 Dardanelles.....2
455 Exchequer.....4.80@5
250 Flowery.....80@85c
635 Gould & Curry.....9⅞@9⅞
405 Hale & Nor.....14½@14⅞
240 Justice.....4.05
1035 Julia.....4.60@4.70
505 Lady Wash.....1@1.20
460 L Bryan.....1¼@1.20
430 Mexican.....38@38½
170 Mackey.....3.65@3.70
125 Morning Star.....3
100 New York.....50c
460 N Con Virginia..11¼@11½
740 N Bonanza....1.65@1.60
330 Ophir.....38@38¼
90 Overman.....11⅞@11½
590 Phil Sheridan....30@25c
195 Sierra Nevada....45½@46¼
215 Savage.....11½@11⅛
390 Silver Hill.....2.05
500 Succor.....50@45c
600 Solid Silver.....50c
100 Trojan.....25c
130 Utah.....14
285 Union Con.....69@68
400 Wells-Fargo.....15c
635 Ward.....1.20@1¼
635 Yellow Jacket....17@17¼

AFTERNOON SESSION.
2025 Argenta.....1
400 Belmont.....45@50c
100 Belvidere.....65c
495 Bodie.....6@6½
245 Bulwer.....17¼@17½
100 Black Hawk.....1.65
225 Bechtel.....60c
100 Belle Isle.....30c
360 Booker.....55@60c
400 Chieftain.....25c
50 O Pacific.....1⅞
450 Champion.....20@16c
695 Dudley.....75@85c
120 Eureka Con.....28
300 Esmeralda.....1
100 Endowment.....5c
120 Grand Prize.....4.70@4⅞
500 Goodshaw.....45@50c
200 Golden Terra.....9½@9⅞
200 Hussey.....15c
00 Highbridge.....65c
650 Hillside.....2½@2.60
645 Independence...1½@1.40
250 Jefferson.....85c
100 Modoc.....10c
1000 Martin White.....6⅞
70 Mono.....2¼
310 Manhattan.....1½
250 Minnietta Bell.....20c
50 Northern Belle.....9⅞
745 Navajo.....10@15c
220 Paradise.....1.60@1.80
685 Raymond & Ely....6⅞@7
460 Summit.....2¼@2.35
400 Star.....60@65c
170 S Bodie.....30c
1400 S Bulwer.....75@80c
140 Tiptop.....50@70c
400 Tioga Con.....1.40@1½
25 Tuscarora.....10c

Pacific Board—Latest Sales.

Wed'sday A. M., Mar. 5.
20 Alpha.....17¼
120 Alta.....5½@5⅛
320 Belcher.....6⅞@6⅝
40 Best & Belcher...17⅞@17⅞
180 Bullion.....5⅝
55 Con Virginia.....5⅞@5⅞
200 Con Imperial.....1
50 Crown Point.....4⅞
100 Caledonia.....2.65
50 Challenge.....2⅝
100 Exchequer.....4⅝
170 Gould & Curry.....9¼@9⅞
200 Justice.....4.15@4.20
100 Julia.....4.70
150 Kentuck.....4⅞
50 Lady Bryan.....1.15
90 Mexican.....7⅞@37¼
160 Ophir.....35¼@35
80 Overman.....11⅜@11⅞
100 Savage.....11⅞@11⅞
80 Sierra Nevada....45@44⅞
150 Silver Hill.....2.10@2.05
40 Utah.....13¼
10 Union Con.....68½
230 Ward.....1.30@1¼
180 Yellow Jacket...17¼@17⅛

AFTERNOON SESSION.
985 Belcher.....6¼@6⅝
100 Bodie.....6⅞
190 Bullion.....5@5⅛
120 Best & Belcher.....17⅞
50 Benton.....4
350 Con Imperial...98@97c
200 Con Virginia....5.80@5⅞
30 Chollar.....38¼
30 California.....6⅛
50 Crown Point.....4.05
80 Exchequer.....4⅞
100 Endowment.....8c
105 Grand Prize.....4¼
70 Gould & Curry.....9½@9⅞
30 Justice.....4.10@4⅛
85 Julia.....4½@4.60
50 L Bryan.....1.30
200 Mariposa.....4⅞@4½
50 Mackey.....3⅞
20 Mexican.....37½@37
250 New York.....35c
10 N Con Vir.....10¼
40 Ophir.....35@35¼
30 Overman.....11¼
100 Paradise.....1½
150 Phil Sheridan.....30c
50 Savage.....11½
100 Trojan.....25c
20 Utah.....13¼
40 Yellow Jacket....17@16⅞

California Board—Latest Sales.

Wed'sday A. M., Mar. 5.
100 Atlanta.....2c
40 Alta.....5½@5⅞
3000 Ætna.....40@27c
1500 Atlas.....11c
50 Argenta.....1.15
200 Atlantic.....40c
30 Best & Belcher.....18¼
60 Belcher.....7@.
90 Bullion.....5
70 California.....6¼@5⅞
60 Con Virginia.....6@5⅞
300 Con Imperial.....1.05@1
40 Crown Point.....5

100	Coso Con	5c	40	Best & Belcher	18@18½
20	Caledonia	2½	500	Belcher	6¾@6½
100	Crevice	20c	40	Con Virginia	5¼
30	Dardanelles	2.10	20	Crown Point	4.35
100	Endowment	10c	200	Con Imperial	1.05
60	Gould & Curry	10¼@10½	20	California	5½
30	Hale & Norcross	14	30	Chollar	39½
40	Justice	4¾@4.05	30	Caledonia	2.70@2.80
40	Julia	4.70@4¾	20	Dardanelles	2½
30	Mexican	41	100	Enterprise	1
300	N Scorpion	37½c	30	Exchequer	4.85
310	Newark	30@25c	10	Eureka Con	27
20	Ophir	36	100	Favorite	70c
1000	Ralston	6c	20	Gould & Curry	9½
100	Succor	45c	100	Golden Chariot	15c
650	S Utah	17@22c	100	O Deposit	40c
30	Savage	12½@12¼	100	Golden Gate	2
220	Santiago	2½@2	40	Hale & Nor	14@14½
200	Senator	37½c	30	Julia	4
100	Silver Jacket	90c	20	Justice	4.10
100	Trojan	25c	200	L Bryan	1.15
15000	U Flag	3c	200	Monumental	3c
100	Ward	1¼@1.30	30	Mexican	37½
100	Wales	1½	100	Newark	35c
200	Wells-Fargo	16@17c	20	Ophir	35½
30	Yellow Jacket	17¾	50	Savage	11¾@11
	AFTERNOON SESSION.		20	Sierra Nevada	45
70	Alpha	17@17½	40	Silver Hill	2½
30	Alta	5½@5¾	350	S Utah	17@18c
3500	Ætna	25@40c	300	Trojan	24@25c
6100	Atlanta	3@2c	145	Tiger	97½c@1
100	Atlas	12½c	10	Union Con	67
200	Almaden Q	90c	300	Wales	1½
20	Bullion	6¼	20	Yellow Jacket	17

Mining Share Market.

The past week has becu rather a stupid one, and interesting events connected with it have been few. The rapid settling back of prices after the jump of last week to not only the points they started from, hut also, in many cases, lower ones, has caused a feeling of despondency and rendered the market decidedly blue.

The early days were characterized by weakness, dullness and a steady decline. There was no severe depreciation, bnt the constant output of stocks by insiders drove all animation and buoyancy from the market. It is hard to say wbat the stock market is to do. Evidently the insiders do not intend to allow any very heavy advance in the immediate future. Probably not nntil the arrangements have been completed for the cross-cutting in the Sierra Nevada.

This nncertainty of the market has kept up the soft, weak feeling till the close, the dealers seeming not to fully comprehcnd the situation. We can hardly hope for a live market before the beginning or perhaps the middle of April. By that time the machinery, etc., for extensive exploration in the Comstocks will be in readiness, and the cross-cutting noted above will be under way. A large and booming market will surely follow the expected discovery of a new bonanza of ore. Bodie looks as though it would furnish prominent mines for speculation during the spring. The Northern Belle, Hillside, Highbridge and others are looking splendidly, extensively shipping bullion, and doing what few other mines are—paying their way—all of which tends to draw the eyes of speculators in their direction.

The ahrupt and unexplained termination, on the 5th instant, of the negotiations pending between the mining companies and the Sutro Tunnel company has had a depressing effect upon the so-called "water miue" shares, a large proportion of which are supposed to be held hy the bonanza firm and their friends. This result, though not wholly unlooked for, is unfortunate all round, as it relegates the matter to the courts, involving additional expense and interminable delay, the mines being meantime deprived of the services of the much needed tunnel, and the owners of the latter of the equally much needed revenues that they ought to derive from the mines.

Bullion Shipments.

Since onr last issue, we have noticed the following bullion shipments: Tybo Con., Feb. 24th, $4,059.60; Highbridge, Feb. 28th, $5,296; Martin White, Feb. 26th, $5,330; Hillside, Feb. 28th, $5,320; Highbridge, Feb. 3d, $4,615; Tybo Con., Feb. 28th, $4,095.09.

THE decree in Italy snbjecting vessels arriving from the United States and South American ports to quarantine, has been abrogated.

STEEL rails for the Southern Pacific Railroad Company are coming from Scranton, Pittsburg and Troy.

WORK has been commeuced in Madrid on the buildings for the International exposition of 1880.

A LARGE cave has been discovered in a spur of the Coast Range mountains opposite Roseburg.

DURING the first two weeks in January, 18,000 tons guano were shipped from Pernvian islands.

THE United States Mints recoincd over $2,000,000 in standard dollars in February.

AN avalanche near Marburg, Austria, killed 21 persons and destroyed nine houses.

MEXICO is negotiating for the completion of diplomatic relations with England.

THE Napa Insane Asylum is now quite full, and still the patients come.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MINING NOTES.—*Ledger*, Mar. 1: The Original Amador gives employment to 48 men. The extraction of ore is sufficient to keep 15 stamps in motiou. The deepest level is 800 ft from the surface. The Keystone has erected machinery for sawing logs, etc. There are three saws, a cut-off saw, one for trimming timbers, and a wedge-saw for making the wedges required in the mine. The machinery is run by water-power, by one of Knight's 10-inch hurdy-gurdy wheels. The Iowa claim adjoins the Lincoln and Mahoney mines of Sutter creek. The bonanza met with in the Mahoney is 600 ft from the Iowa line, and runs in a direct line from the latter ground. Allen Tibbetts is the principal owner of the property, and has put 30,000 shares upon the market at 50 cents a share. A shaft reaches down 60 ft. One hundred and fifty tons of the rock has been milled, with fair results for surface rock. The bottom of the shaft is covered with strata of good ore.

OTHER ITEMS.—Volcano Cor. *Dispatch*, Mar. 1: The Oriesbach mine, Pioneer creek, has about 200 tons of quartz, averaging $60 per ton, now upon the dump, the crushing of which is in operation. The Harmon boys have two ledges on the same lode, from which they are taking out very rich rock. Joe Le Duc has 30 tons of rock out at his claim, which will average $50 per ton. A new quartz lode has been struck in the canyon just below town by T. Gillick. The ledge is six ft wide, and the pay streak two ft. The Downs mine has just had a clean-up after a 14 days' run, the yield amounting to $6,800. The Fort Ann mine has a drift 75 ft in the new shaft, and shows a vein of very rich rock, which prospects well. The old Siebenthaler mine has been relocated by W. Rose, of San Francisco, and soon will be in active operation. The Confidence mine has been bonded by San Francisco parties, and the necessary hoisting machinery for working it is now on the road. Water is scarce here at present, yet a few of our placer claims are being worked with good results. The Philbrook & Starling mine, on Pioneer creek, is being worked with very satisfactory yields to its owners. "Lucky Dick" also has a claim at the same place which is doing finely. The Gold Gravel mining company's tunnel is in 1,300 ft. A 10-stamp mill for cement is now on the road; to be used on the Forty-Nine placer claim.

BUTTE.

MAGALIA G. M. CO.—*Mercury*, Feb. 28: The claim is reached by a tunnel 700 ft long, possessing an incline of 500 ft, and is, to all appearances, an old river channel. In width the channel or lead averages about 75 ft, and the gravel deposit averages from 18 inches to four ft in depth. Fifteen thousand dollars have been expended by the present operators in reopening the mine. The capital stock of the company is divided into 100,000 shares, of which Mr. Barrett owns one-eighth. Two miles of ditch, carrying 175 inches of water, are owned by the association. They estimate the pressure at 70 ft. The gravel is excavated at the bottom of the tunnel, hauled to the surface in cars and then washed. Samples of the dirt appear to be of a clayish character and quite hard; it crumbles after being exposed to the air. Seventy-three ounces of gold were taken out during four days of last week.

KIMSHEW NOTES.—Miners think the quantity of snow sufficient to ensure a bountiful supply of water the coming season. Operations have been resumed by the Snow company with a force of six men, which will soon be increased to 10. Ryan & Co., the principal mining operators on Little Kimshew, have not began work yet, but expect to within a week or so. Quite a number of new claims have been located in these districts the past winter, and the hills are swarming with prospectors.

MINING IMPROVEMENT.—Brock & Taber have received an order from the Vermilion Gravel mining company for 2,000 ft of 7-inch and 1,000 ft of 11-inch water pipe, the same to be made of No. 16 iron. The ground belonging to this company is located in what is known as Forbestown ravine, and has been worked as far up the gulch as the present water supply will admit of. In order to get a further supply of water it is necessary to force the same over a ridge of 300 ft elevation on one side and 200 on the other. A Keep pump, weighing 15 tons, will be located at the base of this ridge, from which water will be forced through the 7-inch pipe to a reservoir on top of the hill, from which the 11-inch pipe will convey it to the claim. The reservoir will hold sufficient water to run a 100-inch stream for 12 hours.

BUTTE CREEK.—Helltown is a first-class mining camp. The Shepard ditch is now completed to Whisky Flat, where one-half of the 4,000 inches it contains will be piped on to the west side, and the other down on the gravel hill of the east side. Work on the Whisky Flat claims will be resumed very soon, as the suit between Fred Stryker and the Maurice estate has been decided. Mary's Flat has its ditches, flumes and pipe all in readiness for the water. Paradise Flat is being worked by Mattby & Rister. Adams & McIntyre's hill claim has paid about 300 ounces; four months' work by three men. Hupp's hydraulic claim is now in operation, with every prospect of its former success.

MONO.

UNIVERSITY.—*Standard*, Feb. 28: A progress of 16 ft has been made in the drift on the 100 level; total length 200 ft. The ore body in this level has increased to two ft in width. The drift on the 200 level is now in 23 ft. The ore has changed somewhat in character, being now all fine decomposed quartz, and of the full width of the drift.

BULWER.—The south drift, 380 level, has been advanced during the past week nine ft; total length, 174 ft. The ledge is two ft wide and looks well. The west crosscut from the drift is in 15 ft. At 10 ft from the drift a fine ledge was cut, one ft wide, of very good ore. The ledge in the upraise is two ft wide, of very fine ore. The Stonewall stopes continue to look well. There has been no particular change in the tunnel, which is still in good blasting ground.

SYNDICATE.—The south drift from the east crosscut was advanced seven ft during the week. Crosscut No. 2, east, is in 44 ft. During the past week three small seams of quartz have been cut in the latter. The formation is looking favorable, and it is expected that the ledge will be cut at an early day. The west crosscut has advanced 21 ft, in soft porphyry. The winze on the Osceola vein has been sunk 11 ft; total depth below the tunnel floor, 181 ft. The vein is three ft wide, of good milling ore.

SOUTH BULWER.—During the week good progress has been made in the work of development. The 350-ft crosscut has been advanced 14 ft; total, 38 ft. The ground in the face is hard blasting porphyry, and progress is necessarily slow. This crosscut will be pushed ahead as fast as possible to strike the ledge discovered in the 200-ft crosscut. During the past few days, important developments have been made in the 200 level. A new ledge eight ft wide has been cut. It is soft decomposed quartz and clay, and some of the ore prospects very nicely.

BLACKHAWK.—The new shaft is down 291 ft. The bottom is in a mixture of sandstone boulders, clay and quartz, all of which will give a prospect in gold by the horning process. The west crosscut on the 220 level is in 40 ft. At a point 34 ft west of the shaft, a vein of quartz was cut five ft in width, between well-defined hanging and foot walls. The ledge stood at an angle of about 85°, pitching west. A drift has been started south, and the quartz is being raised to the surface and put on the ore dump. The vein is a strong one, four or five ft in width, and ore taken from it at present resembles the rich rock from the Stonewall lode on the other side of the hill. It is fairly "splashed" over with free gold, with dark spots similar to the Stonewall rock. This ledge was cut in the shaft 120 ft from the surface, pitching west. Another ledge, wider and richer, was cut 110 ft from the surface, larger and richer at that depth than the Warren lode, on which the drift is now being run, which is yet to be cut by the crosscut on the 220 level. Between the two ledges in the shaft was found the only hard rock encountered in sinking, and this same intensely hard rock, only much harder, is now found west of the Warren.

BENTON NOTES.—Cor. Inyo *Independent*, Feb. 28: The Comanche mill has started once more, under the management of Robert Burnham. The mill is working over old tailings, some of which have been lying here for several years. They yield considerable quicksilver, as well as a good profit in bullion. Burnham has a process, partly his own, by which he gets a better result than the mill has been able to show heretofore. The Tower mine has been put in working order. A piece of rock from a cave on the lower drift assayed $4,680 per ton. The Josephine tunnel is in 110 ft, and the rock averages $40 in gold and silvar; one piece went $700. In Clover district little is being done at present. The claims are owned by prospectors who depend upon their muscle for capital. J. H. Taylor has a claim, the Oro Fino, on which he sank 46 ft, striking a ledge 45 ft wide, and the thickness is not yet ascertained, as work had to be suspended on account of lack of funds. Assays at the bottom showed $45 in gold, and $20.81 in silver. J. N. Kellogg has a very fine claim, upon which a tunnel extending 180 ft taps the ledge 60 ft under the surface. The Gray Eagle shows a small vein assaying $200. The Wasp, owned by Edward Taylor and J. O. Wheeler, is a large, well-defined lode. The cap-rock shows $19.50, though there has been nothing done to develop this valuable claim. There are over 30 good locations in the district.

NEVADA.

THE CROSBY & OLIVE.—*Transcript*, Feb. 28: This mine, originally owned by John L. Williams, was last year purchased by the Messrs. Crosby and Joseph Olive for $20,000. The claim comprises 3,000 ft on the Providence lode, south, and two other veins. The present owners have erected hoisting works, consisting of a 30-horse power engine, 12-inch stroke and a boiler 36 inches in diameter. The pump is a powerful one capable of discharging 25 inches of water. The rock shows well most of the way in the north 100 level, considerable ore having been stoped out. The vein is in and out at places on this level, but in this drift shows two strong chutes of rock. There has been some crosscutting done on this end of the level, showing the vein to be well confined. Retracing his steps to the southward he traveled 160 ft in the south drift of the 100 level. In the head of this drift the vein is three and one-half ft thick and looks well. At this point a large volume of water, about 18 inches, pours through the rock, and evidently comes from a heavy ore vein farther south. This can be properly classed a contract vein, has a vertical dip of 40° to the east, and runs northwest and southeast. There has been extracted 1,000 tons of fine ore, exclusive of surface working. The ore is of free gold and sulphuret nature, and cannot be called refractory.

MINING NOTES.—*Foothill Tidings*, Mar. 1: Very rich quartz was taken out of the Scadden Flat mine lately, a piece the size of a double fist containing gold estimated at $50. A clean-up of 55 loads of quartz, taken out by tributers, in the south workings of the Rocky Bar mine, paid upwards of $60 per ton. New York hill is said to be looking better than for sometime. John Bryan has a new location on the top of Oshorn hill called the Electric Wand, and is at work opening it up. The Wyoming mine never looked so well as now. Last week a clean-up of $2,700 was made after a three days' run. Rich specimens have recently been found in the Deadwood mine. The Eureka Lake company at Moore's Flat have decided not to pay new men employed more than $2.50 per day and the Miners' Union there has been revived to resist the reduction. In Watt blue gravel they have stoped east drift and drifted west 12 ft. Bedrock granite and pitching. Drifted 15 ft east last week. The tunnel of the Planet Gravel company was extended 17 ft last week; making the total length 1,624 ft. It is believed that the ore now coming from the Deadwood mine will not yield less than $40 per ton.

PLACER.

SHURTLEFF QUARTZ MINE.—*Herald*, Mar. 1: The main shaft is now down 205 ft. The tunnel of 530 ft strikes the shaft 140 ft from the surface. At the lowest level a drift has been run 85 ft east and west from the shaft. From this drift 55 tons of rock have been raised, which milled $30 per ton, or the nice sum of $1,650. During the last two weeks Mr. Shurtleff has been stoping above the lowest level, and has taken out 40 tons of rock which will average the sum of $50 per ton, or in amount, the sum of $2,000. The lead is about two ft in thickness, and through it there is a streak of very rich rock, which will mill at from $500 to $1,000. The rock which is in this rich streak is saved separate from a milling quartz as specimen rock. Mr. Shurtleff owns 2,000 ft on this lead, from Smith's ravine on the east to North ravine on the west. The expense of hauling and milling the quartz is $4 per ton. The whole expense of working the Shurtleff quartz mine is not over $6 per ton.

PLUMAS.

PLUMAS EUREKA.—Alioth Cor. *National*, Feb. 22: The tailings from both of this company's mills are run in flumes to a system of arastras, 26 in number, strung along the bank of the creek in as close proximity as the declivity will allow for the power necessary. They are driven by the common Mexican horizontal wheel, but are put up strong and good. They are owned and operated by Italians, who, besides a monthly rent, have paid a handsome bonus for the privilege. The upper mill has eight stamps more than the other, or 48 in all. The concentrators, 22 in number, are the patent of W. H. Patton, the civil engineer of this and the mills under the control of Cross & Co. The motion to these concentrators is imparted by a worm wheel. The concentrated stuff is roasted in a Bruckner furnace. The old, or snow-shed tunnel supplies the old mill. The new has its supplies in part from the new tunnel lately run on the level of the lower Mammoth tunnel. It is 200 ft below the other. Ore is also brought from the middle ledge and '76 mine, the latter yielding gold of a finer quality than any other lead upon the mountain. Besides the three lodes named, they have built a house for the workmen, and started a tunnel in the Rough & Ready ground, nearly a mile south, with a view to tap the above-named mine, as well as two others known to be upon that side. There is more ore in sight now than ever before. The lode develops better as depth is made, and there is drainage yet by tunnel 500 or 600 ft below the present workings. There is a continuous body of quartz on the upper level of 850 ft in length. The middle and the '76 lodes being situated higher up, are capable of being drained over 1,000 ft in depth.

TRINITY.

NEW RIVER MINES.—*Journal*, Mar. 1: All the miners are busy. The Eagle Creek company have begun sluicing. The Slide Creek company have an abundance of water, and are running their saw mill day and night. Their claim will be in working order in a short time. They have some very rich ground, with a fair prospect of striking an old channel. The same company intends taking water from the main river and conveying it by ditch and flume two and one-half miles down stream to Rattlesnake bar, where fine prospects have been obtained. This company have a new ditch cut, and mill framed and irons ready to set up as soon as spring comes. Another company propose to take a ditch from the river for the purpose of conveying water to the bar at the mouth of this river, which contains 25 acres of mining ground. On a portion of this bar there is a gravel bank from 40 to 60 ft deep. This will be the most extensive mining enterprise on either Trinity or New river. The water will be carried across the river, below the mouth of this stream, and then along down the Trinity as far as David Gray's place, five miles from where the water is taken from the river. This flume and ditch will cover mining ground enough to last the company a lifetime. The bars are all high, and afford from 40 to 75 ft "dump" for rocks and tailings.

NEVADA.

WASHOE DISTRICT.

In the absence of our usual Washoe correspondence we publish letters from the various mine Superintendents of the dates mentioned:

JULIA.—Letter of 1st: Good progress has been made in reducing the accumulated water in main incline below 1800 level, which stands 200 ft below the latter level, or 83 ft above the sill floor, 2000 level. All preparations are completed to discharge the water in the Sutro tunnel on receipt of instructions from the main offices in San Francisco. Winze sinking from 1800 level, south drift, up to present time, has made slow progress on account of the intense heat, but the present aspect bids fair for better progress in the future.

WARD.—Letter of 1st: Our east crosscut, 800 level, has been advanced 26½ ft for the past week; total length, 475 ft. Material encountered, streaks of various widths composed of lime quartz, soft vein porphyry; also streaks of solid block bird's-eye porphyry. Have 225 ft yet to drift to reach the downward continuation of the vein, which crops out so prominently on the surface and east of main shaft. Everything about the mine working well.

CHOLLAR.—Letter of 1st: The Chollar-Norcross-Savage shaft has been sunk 11 ft during the past week; the water hoisted from the bottom with skeets has averaged 85,000 gallons per day.

SILVER HILL.—Letter of 1st: During the past week have sunk and timbered the main incline 16 ft. The main east crosscut on 1100 level has been extended 38 ft. The face is still in porphyry carrying considerable iron.

OPHIR.—Letter of 1st: The repairs on the pump-rod and connecting rod at the head of the main incline were completed Monday, when hoisting the usual amount of ore was resumed. But owing to the water, work was not resumed in the incline on the 2200 or 2100 levels until yesterday. During the past week we have put in a new pump-bob at the 600 station to take the place of the old one, which was too small. We are still at work repairing the main shaft above 1465 station. We hope to have this work completed in another month. The flow of water from the Union Con., east drift, continues to decrease, and is now not more than two and one-half inches.

MEXICAN.—Letter of 1st: On our 2000 level the main north drift has been extended 50 ft during the past week; total length from our south line, 523 ft. The material passed through and in the face is hard rock, which blasts well. The flow of water from this drift has increased to about two and one-half inches. On our 1600 level the Union Con. joint winze has been sunk and timbered 12 ft; total depth, 256 ft on the slope. No change in material passed through.

BELCHER.—Letter of 1st: The main incline has now attained a depth of 88 ft below the 2560 level, having been sunk 21 ft the past week. The south drift on the 2560 level is in a distance of 186 ft, 54 ft having been added the past week. Everything in and about the mine is going along smoothly, and crosscutting can be commenced any time. In the course of about two months the main incline will be deep enough to admit of opening another level.

HALE & NORCROSS.—Letter of 3d: The winze from our 2000 east drift is down 60 ft. The water this morning is 21 ft below the 2000 station.

EXCHEQUER.—Letter of 3d: The north drift has been extended during the past week 20 ft; total length, 207 ft. The formation on this level is a kind of vein porphyry with streaks of quartz.

GOULD & CURRY.—Letter of 2d: During the week crosscut No. 4 west was extended 25 ft, and is now in porphyry. Crosscut No. 3 east is in 308 ft, having been advanced 25 ft during the week; the face is in hard blasting rock. East joint drift, 1700 level, is in 568 ft, having made 38 ft. The face is in good working ground. The Osbiston shaft was sunk 10 ft. The flow of water continues very strong. Total depth of shaft, 485 ft.

SAVAGE.—Letter of 3d: No work has been done in the mine for the past week, except some little repairing in the vertical shaft and incline. We have disconnected our donkey pumps and have allowed the water to raise to our tank, 40 ft below the 2000 level, thereby making a great saving in the consumption of wood. All the machinery is in good working order.

BEST & BELCHER.—Letter of 2d: Since my last report west crosscut No. 3, 1000 level, was advanced 24 ft, and is now in 128 ft from the winze. The face is still in vein matter but shows less quartz. The 1900 level joint winze is down to the 2000 level, and the station cut out and timbered. This work will be stopped for the present. The joint drift, 1600 level, was extended 38 ft and is now in a total distance of 568 ft. The face is in easy working ground and perfectly dry. Osbiston shaft is down 485 ft, having made 10 ft during the week. The water is still strong.

CON. IMPERIAL.—Letter of 2d: Our station chute for south winze at our 2600 level has been finished and we are now drifting north and south on this level. Have advanced the north drift 10 ft. The south drift to connect with Jacket 2400 level has been advanced 10 ft. The formation in face of both drifts is porphyry with streaks of quartz. We are also engaged in repairing and altering the station at our 2135 level of the joint winze. No change in flow of water from the face of joint drift east 2400 level.

BULLION.—Letter of 3d: On last Monday connection was made between our 2150 and the 2000 level of the Imperial. This connection has greatly cooled off this drift, the temperature falling off at the rate of one and half per cent. per day. We will put this level in order as rapidly as possible, and this week will commence crosscutting east. The 1840 level has been cleaned out and an east crosscut started. During the past week no work has been done in the incline, it being deemed not advisable to resume sinking until the new air compressor is in place. The excavation for the foundation of the new air compressor is completed and we expect to have the entire work completed in 30 days.

EUREKA DISTRICT.

THE HAMBURG.—*Sentinel*, Mar. 1: The intermediate drift, 130 ft below the 250 level, was advanced 22 ft during the past week beyond the upraise, following the vein, which shows a material improvement, and is yielding a considerable amount of good ore. On the 600 level the west crosscut was advanced 15 ft; making a total from the south drift of 150 ft, with no special change. South drift from crosscut advanced 18 ft, making a total of 85 ft; is in favorable vein matter, with bunches of iron and low-grade ore. The winze was sunk nine ft, in very hard rock, but the bottom is now in soft material, which works well. On the 450 level the east crosscut, 330 ft north of turn-table, is in 11 ft.

THE EUREKA CON.—Work has been carried on with good progress in extending drifts, etc., there having been 204 ft completed during the week. The new pinion is in place, and hoisting through both compartments is going on as usual. Furnace No. 3 has started up, and is running first-rate. The following work has been done on the several levels: Northeast drift, on fifth level, from cave continued three ft, and is now in 125 ft; started raise from south drift and made 10 ft. East drift, on seventh level, from chute continued 13 ft, and is now in 139 ft. West drift, on 11th level, from ore chamber continued 20 ft, and is now in 89 ft. East drift, on 12th level, from crosscut No. 1 continued 27 ft, and is now in 364 ft. East drift from crosscut No. 2 continued 30 ft, and is now in 111 ft. Drift from raise continued 25 ft, and is now in 145 ft. North crosscut, on 13th level, continued 42 ft, and is now in 66 ft.

NOTES.—A large water flume is being built by the K K down the canyon through their waste dump. About 200 tons of ore are shipped daily by the Richmond. El Dorado mine, Prospect mountain, is now worked on lease by six men. The Silver State and Original Baltic mines have been bonded to some Eureka capitalists. Rapid progress is being made on the Phœnix incline. The Jackson is still shipping its usual quantity and quality of ore to the Meta-

[Continued on page 156.]

On Artesian Wells.

[Read before the Section of Geology, Mineralogy and Mining, by CHAS. D. GIBBES, December 14th, 1878.]

In the investigation of all matters of natural science there is none of more importance to this State than the supply of good pure water, not only adding to the health of the inhabitants but to the value of lands on the arid plains. The subject of artesian wells is a very important one to this city at present, and I hope it will receive an early investigatiou hy the memhers of our section. The object of this paper, however, is not to make a report on artesian wslls, for I have heen very much disappointed in obtaining the information that I sxpected.

In 1875 I sent out circulars to most of the well-horers in the State, requesting a record of the different wells to be sent to me, to he compiled in a report to the Academy. Some fsw answered, saying they would do so in a short time; hut up to this time have not been heard from. I therefors merely propose to state a few facts that have come under my ohservation; and, although not a geologist, give my views on the subject, with the hope of drawing out the opinion of other memhers who are hetter qualified.

First—what is an artesian wsll? Webster's definition is: wells mads hy horing into the earth till ths instrument reachss watér, which from internal pressure flows spontaneously like a fountain. Ure says: under this name is designated, a cylindrical perforation, hored vertically down through one or more of the geological strata of the earth, till it passes into a porous gravel hsd containing water, placed under such incumbent pressure as to make it mount up through the perforation, either to the surface or to a bight convenient for the operation of a pump.

Ths hot springs that flow out to the surface in many parts of ths world, rising from great depths, are natural artesian wells. The first overflowing wells wers made in tbs French province of Artois (Latin *Artesium*), whence the name of artesian. They have long been in use in that country.

Wells in San Francisco.

The city hase from which the elevation of the streets is reckoned, is the level of the wharves on the city front, it heing six feet and seventenths ahove mean high tide or level of the sea, and the grade is given on a large map of the city, at the intersection of the streets.

From the information published in the *Call* and what I have heen ahle to collect, water has heen ohtained at a depth of from 80 to 360 feet, which is the deepest well in the city of which we have any record, although there may he others deeper. This well is at the Pacific Iron Works on First street (which is hut a few feet ahove the sea level), yet it affords loss water than many wells only 140 or 150 feet deep.

Although the supply from each well in the city is ample for the purpose for which it was constructed, yet in comparison with the depth and amount of water furnished hy some wells, it is mere prospecting; for as yet no large stream with a good head or known source in an elevated region sufficient to furnish a supply for the city has yet heen struck. It is possihle when the drill penetrates through the sandstone stratum into the other cretaceous rocks, a large stream of water may hs ohtained; hut nons from the Sierra Nevada unless we reach the geological formation of that region. It is true that we have a good supply of water at a short depth in the reservoirs of the alluvial deposit underlying the city, hut they appear to he disconnected and local in their character, as I will endeavor to show; and I will now call attention to a few wells represented in diagram *A* on the map marked grade of Van Ness avenue. It extends from Sacramento street, south to Market, then on to Folsom. The elevation heing marked ahove at the intersection of the streets, and the depth of the wells at the bottom of each.

A—Grade of Van Ness Avenue.

The explanation of diagram *A* is as follows: 1, Market street, elevation 44 feet; 2, old well at City Hall, depth 195 feet; 3, new well at City Hall, depth 180 feet; 4, well at ths corner of Van Ness avenue and McAllister street, 130 fest; 5, well at the corner of Van Ness avenue and Sutter street, 206 feet; 6, wells at Sutter Street Stahles, 180 feet, and Caseholt, 152 feet; 7, wells at Chicago Brewery, 166 feet; Graves' well, 160 feet; 8, sandstone; 9, Bradhury well, 194 feet; Lyle well, 163 feet; 10, Hayward well at the corner of Sacramento and Polk streets, 140 feet; 11, water line; 12, city hase; 6.07 feet ahove mean high tide; 13, 13, sea level.

Commencing at the corner of Sacramento and Polk, elevation, 170 feet, is the Hayward well, 140 feet deep, ths hottom heing, yon perccive, 30 feet above the city hase. Ths elevation at California and Van Ness is 180 feet. On the the east side a little helow the grads is the Bradbury well, 194 feet deep, the hottom heing ahout 20 feet below the hase. Opposite, on the west sids, and ahout 10 feet above the grads is the Lyle well, 163 feet deep, ths hottom being about 27 feet ahove the city hase. I call attention more particularly to these three wells as they are shown in another diagram. Next are the following wells: Graves', corner Van Ness and Pine, elevation 180, depth 160; Chicago Brewery, Pine near Polk, elevation ahout 153, depth 166; Sutter Street Stahles, corner of Polk and Bush, elevation 142, depth 180; Caseholt's, corner of Larkin and Bush, elevation 150, depth 152; corner of Van Ness and Sutter, elevation 162, well 206 feet; corner of Van Ness and McAllister, elevation 58, well 130; City Hall, elevation ahout 50 feet—old well 195 feet, new well 180; Stevens' well, corner of Folsom and Eleventh streets, elevation 16 feet, depth 144 feet.

These wells are also shown in their relative position on a city map, hy red circles. Van Ness avenue, by a hlack liue; Octavia, Jones and Sacramento, hy red lines; Market street, hy a green.

Diagram B.

Explanation of figures in diagram *B:* 1, Octavia street, elevation ahove city hase, 280 feet; 2, Gough street, 270 feet; 3, Franklin street, 220 feet; Lyle well, 163 feet; 4, Van Ness avenue, 180 feet; Bradbury well, 194 feet; Hayward well, 140 feet; 6, Polk street, 160 feet; Larkin street, 180 feet; 7, Hyde street, 210 feet; 8, Leavenworth street, 260 feet; Jonss street, 300 feet. Lower stratum sandstone; next indurated sands containing water; next clay; and upper stratum sand.

This is a cross section on California street from Octavia to Jones streets, showing the relative position of the three first mentioned wells, and the formations through which they have passed.

The elevation of Octavia street, shown to the west, is 280 feet; that of Jones, on Clay street hill to the east, is 300 feet; and Polk street, the lowest in the hasin, is 160 feet. The Bradhury well, in the center, 194 feet, does not reach the so-called hedrock; hut the Hayward well on the east, 140 feet deep, and the Lyle well on the west, 163 feet, do reach it.

This hedrock is said to he serpentine, but I have not heen able to ohtain any specimens from the wells. Mr. Lyle, however, informs me that it is the same as the ontcrop on the hills. He also says that his well passed through ths following strata: sand, 30 feet; clay, 53 feet; and what is called sandstone, 80 feet. In this sandstone the water percolates, and the pipe through the sandstone heing perforated, the water rises in it, but it does not come to the surface. In his well it is 56 feet helow the surface, and in others about the same level. It is represented iu the diagrams hy a hlue line across ths wells. The sandstone forms a reservoir. There is certainly no stream at the bottom.

Mr. Lyle's tank holds 16,000 gallons, and is filled in 11 hours hy pumping with a hot air engine; and the supply appears to be the same.

Diagram F

Represents a section hetween Octavia and Gough streets. On examining the outcrop on the hill at Gough street, betweeu Sacramento and California streets, I find it to be sandstone, (see specimen marked *A*). This sandstone must he the hedrock of the hasin; clay and sand ars also seen ahove it.

The sxplanation of diagram *F* is as follows: 1, Fulton street, 67 feet; 2, McAllister street, 70 feet; 3, Tyler street, 81 feet; 4, Turk street, 102 feet; 5, Eddy street, 140 feet; 6, Ellis street, 168 feet; 7, O'Farrell street, 200 feet; 8, Geary street, 200 feet; 9, Post street, 200 feet; Sutter street, 220 feet; 10, Bush street, 220 feet; 11, Pine street, 240 feet; 12, California street, 280 feet; 13, Sacramento street, 320 feet. From 1 to 7, serpentine; from 7 to 13, sandstone.

Diagram G.

The following are the figures on diagram *G:* 1, Franklin street, 170 feet; 2, Gough street, 196 feet; 3, Octavia street, 200 feet; 4, Laguna street, 180 feet. From 1 to 2, sand; from 2 to 3, serpsntine.

At the cut on O'Farrell street, the serpentins can hs seen with an eastsrly dip of 25° or 30°; and opposite, on the east side of Gongh street, is a sand hill 40 or 50 feet high. I was informed hy a man who said that be had lived there 17 years, that no serpentine was ever seen west of this outcrop for a long distance.

Wells in the Bay.

Artesian wells are common on the peninsula and in Santa Clara valley; hut soms of you may not he aware that wells have also been sunk in the bay of San Francisco. Ths enterprising firm of Morgan & Co., 87 California market, have oyster heds at suitahle locations on the west side of the bay, for a distancs of 17 to 18 miles. Each location is fenced in to keep the sting ray from eating the young oyster, of which ahout 10 car-loads are imported from ths East every spring and planted in these heds. The size of the young oyster varies from half an inch or more. The firm have three stations, at which men ars employed to take cars of the oyster beds. One is opposite Millhrae, ahout three-quarters of a mile from the shore, consisting of a wharf ahout 20 fest high, with a houss on it, and is called ths Millhrae station. The next is Belmont station, on a small island at the entrancs of Steinhergen's creek, opposits Belmont. The third is Dumharton station, ahout ons mile south of Dumharton wharf, and over a mile east of the western shore. Thers is also a wharf ahout 20 feet ahove the hottom of the hay, and has a house on it. Iu August, 1878, a well was hored at this station, 212 fest deep from the top of the wharf; it discharges a stream of good, sweet drinking water two feet ahove the wharf, and is supposed would rise much higher if the pipe was carried up. The water of ths bay at the wharf, is 10 feet deep at mean high tide, and overflows the salt marsh a foot or more; so that we may call the flow of the well at 10 to 12 feet ahove the marsh.

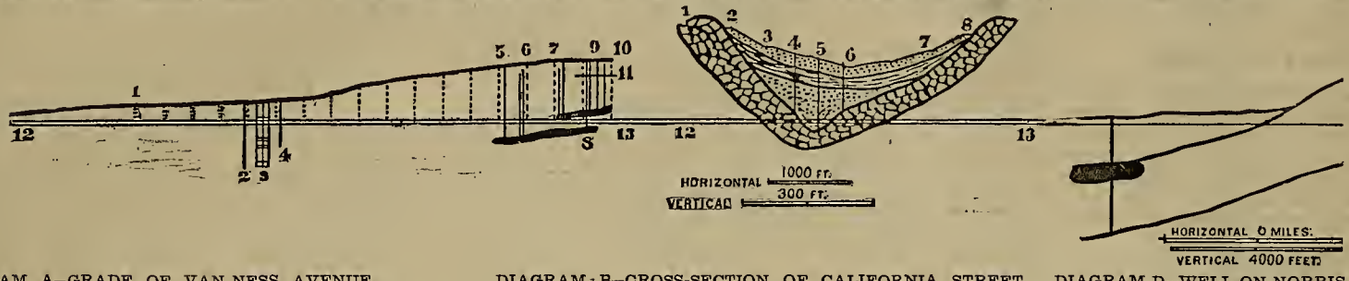


DIAGRAM A—GRADE OF VAN NESS AVENUE. DIAGRAM B—CROSS-SECTION OF CALIFORNIA STREET, FROM OCTAVIA TO JONES. DIAGRAM D—WELL ON NORRIS GRANT Depth, 2,107 Feet.

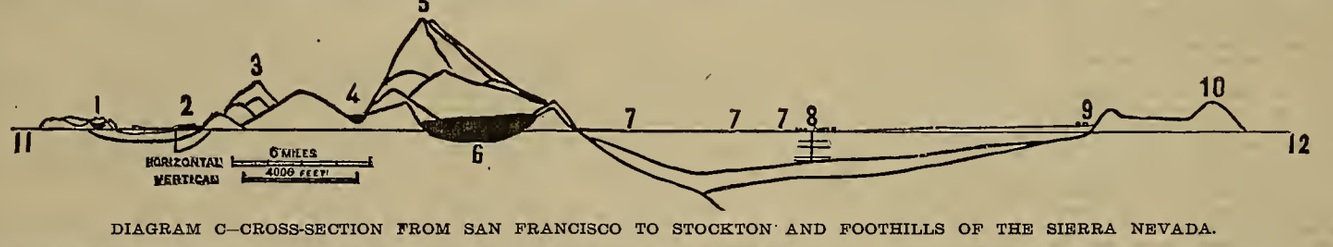


DIAGRAM C—CROSS-SECTION FROM SAN FRANCISCO TO STOCKTON AND FOOTHILLS OF THE SIERRA NEVADA.

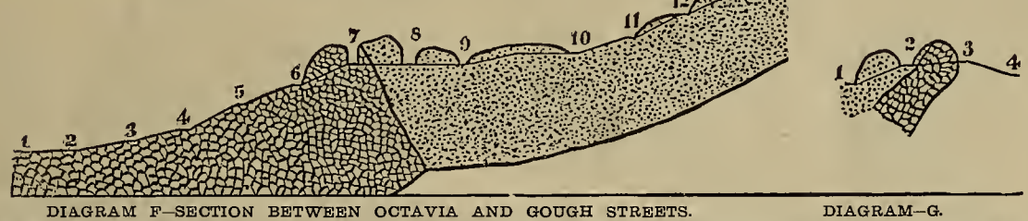


DIAGRAM F—SECTION BETWEEN OCTAVIA AND GOUGH STREETS.

DIAGRAM—G.

Construction of the Well.

The well is constructed in the following manner: Of No. 16 hlack iron artesian well pipe, 11 inches in diameter and 2 feet in length; also another a size larger to slip over the first, and hreak the joints a foot each way. This double pipe was lowered down through the water and mud 42 feet from the top of the wharf, and sunk into the clay a foot or more; the water and mud is now pumped out; and two smaller double pipes, one of nine inches and the other of seven inches diameter, and made in the same manner, are inserted. The spaces between the three pipes are filled with cement, forming a solid pipe of six thickness of iron and two spaces of cement; and the horing of the well is now commenced. The space between the seven and nine-inch pipes, however, is not filled with cement until the well is finished, as the pipe has to follow the auger. This well, like those in the Santa Clara valley, 6 to 10 miles distant from tide water, is affected by, or rather, rises and falls at the same time as the tide. The hight of the rise and fall at Dumbarton have not yet heen determined for want of proper pipe.

Phenomena.

On Saturday night, Septemher 28th, this well at the Dumharton station commenced to discharge muddy water, and continued doing so two days or more; which it had never done before; it is now flowing as usual. On Sunday the 29th, ahout 6 P. M. (20 or 24 hours later), you will remember a strong shock of an earth-

[Continued on page 153.]

The Engineer.

Locomotives Without Fire.

Machines on tbe above-named principle are now at work on the tramway from Ruell to Marly, near Paris, and with very satisfactory results. The system in use ie one introduced by M. Francy, an engineer, and is based on the fact that water boils at a lower temperature proportionately to the production of the atmospheric preseure. Most of our readers are aware that altbough water requires a beat of 212° Fahr. to boil at tho level of the sea, a much lower temperature is sufficient to produce the same effect ou the top of a mountain We will now explain how that physiological fact is practically employed. Into a reservoir of thin steel—wo cannot call it a boiler, for it bas neither fireplace nor firo—ie introduced water at a temperature of 200° Fahr., and then covered hermetically. The steam it gives off at once fills up the superincumbent space, and produces a pressure of 15 atmospheres. As long as any of the vapor is turned on for moving the machine, the pressure is reduced, and tho water then begins to boil, producing a fresh supply of steam. Of course, that process is of but limited extent, as, at the commencement, the liquid only contained a certain amount of heat, which is gradually diminished as the reproduction of steam takes place at lower temperature by the exhaustion of the superincumbent pressure. So far, a machine of this description would be obviously totally inadequate to any very prolonged journey. But for short transits it has been found extremely serviceable. As the amount of pressure required to work the engine is only five atmospheres, a series of valves are so arranged as to prevent a greater amount of force issuing from the reservoir than is necessary, and thus retaining, as far ae possible, the heat originally contained in the water. The driving part of the machinery is nearly identical with that of ordinary locomotives, with a few modifications with the purpose of guarding against useless waste of the heat originally introduced into the reservoir.—*Galignani's Messenger.*

Excavations and Foundations in Sand. M. Plocq has published an interesting paper upon the recent harbor improvements at Dankirque and Grovelines. There are 10 sluices for controlling the fresh and ealt waters of the districts for various purposes of maritime and domestic economy, as well ae for tbe wants of the military service and for defensive operations in time of war. The sluices are built in a soil which is wholly made up of a pure sand of flour-like fineness, reaching to a depth of from 50 to 65 fcet below the lowest tidal levels. The works were all executed by the help of coffer dams, in preference to dredging, and the preparations were so thorough that it was always easy to work in dry sand even at the lowest foundation levels. The total cost was less than half what it would have been by the old method of dredging, and the saving of time was in about the same ratio.—*Ann. des Ponts et Chauss..*

Elevated Railways not Detrimental.—Instead of proving tbe terrible detriment to property which was predicted, the elevated railways in New York city, seem to be conceded to bave greatly increased trade on the streets upon wbicb they run. So marked is the movement of tbe retail business from Broadway to Sixtb avenue, that heavy property owners on the former tboroughfare are inclining to the opinion that they must bave an elevated road also. Tbe complaints in regard to the noise of the trains seem to have nearly ceased, while tbe bnndreds of thousands of people who reside in the upper part of the city are full of gratitude for the vast improvement in the means of transportation.

New Tailings Dredger.—The Golden State and Miners' Fouudry, of this city, has recently completed a vacuum dredger for the Slate Creek mining company. The dredger, built at a cost of $20,000, will be used in dredging the streams in the northern part of the State into which the tailings and debris of the past 20 years or more have been run. The dredger takes up the earth by means of a bell-shaped box, from wbich tbe air is exbausted by means of condensed steam, and is capable of lifting 200 square yards of earth per bour. Tbe eartb will be dumped into ebort sluice-ways, conveniently arranged and treated in tbe usual manner.

The Great Hungarian Tunnel.—On tbe 21st of October the great Josef adit at Schemnitz in Hungary was opened. The works have been carried on since 1872, tbe Hungarian government granting £10,000 a year toward them. Tbe adit is over 10 miles long, being some 50 yards longer than tbe Mount Cenis Tunnel. The total cost of the undertaking was £459,900; it was carried out entirely by Hungarian enterprise, and partly with Hungarian machinery.

Engineers are at work running the line for the narrow-gauge railroad on the east side of tbe San Lorenzo river.

Prof. Feser, contrary to tbe generally accepted verdict, announces, as tbe result of a long eeries of experiments, tbat salicylic acid has no value eitber bas a prophylactic or in the treatment of infectious diseases, carbuncles, etc.

Useful Information.

Cutting Glass.

For cutting flat glass, such as wiudow-panes, and for cutting rounds or ovals out of flat glass, the diamond is the best tool, and if the operator has no diamond it will always pay to carry the job to a glazier rather than waste time and make a poor job by other and inferior means. When, however, it is required to cut off a very little from a circle or oval, the diamond is not available, except in very skillful hands. In this case a pair of pliers softened by heating, or very dull sciesors, is the best tool, and the cutting is best performed under water. A little practice will enable the operator to shape a small round or oval with great rapidity, case and precision. When bottles or flaske are to be cut, the diamond is still the best tool in skillful hands; but ordinary operators will succeed best with pastiles, or a red-hot poker with a pointed end. Tho latter is preferred, as being the most easily obtained and the most efficient; and there is no difficulty in cutting off broken flasks so as to make dishes, or to carry a cut spirally round a long bottle so as to cut it into the form of a cork-screw. And, when so cut, glass exhibits considerable elasticity, and the spiral may be elongated like a ringlet. Tbe process is very simple. The line of the cut should be marked by chalk or by pasting a thin strip of paper alongside of it; then make a file mark to commence the cut; apply tho hot iron and a crack will start; and this crack will follow the iron wherever we choose to lead it. Iu this way jars are easily made out of old bottles, and broken vessels of different kiuds may be cut up into new forms. Flat glass may also be cut into the most intricate and elegant forms. The red-hot iron is far superior to strings wet with turpentine, friction, etc.

The Manufacture of Curtain Rings.—In the ordiuary process of pressing or stamping brass, as in making curtain rings, the surface cannot be raised by one blow; it requires a succession of blows. This, however, would make it brittle if it were not prevented by annealing the metal from time to time. In the process of annealing it becomes coated with black scale, which can be detached by means of aqua fortis. Tho process of "dead-dipping" to obtain a dull surface, is conducted by dipping the annealed metal iu aqua fortis (one part of aqua fortis to four of water) till the black scale rubs off easily; hen, after washing in water, it is dipped into acid of double the strengtb. This acid will attack the metal and form a green layer on the surface, wbich really consists of bubbles of gas. Wheu it is well coated it is taken out and washed and rubbed with cold sawdust, and without removing tbe adhering sawdust is plunged into the strongest acid. It is taken out of this almoet immediately, and washed in water containing cream of tartar dissolved, and is lastly placed in bot sawdust.

A Vegetable Green for Confectioners.—It appears, according to one of our French exchanges, that from the grains of raw coffee there may be extracted a beautiful green coloring matter adapted to all the purposes of the cook and confectioner, and which will undoubtedly prove of great value as a commercial product, inasmuch as the number of green colore suitable for such uses, and whicb are not poisonous, is very limited. According to M. Zech, who describes the process of extraction, the coloring matter is obtained in the following way: The coffee grains are crushed and the oil ie extracted by means of ether; they are then dried and agitated with the white of eggs, so as to form a sort of paste, and the latter is exposed for several days to the air. The preseuce of the white of eggs then determines the appearance of an emerald green. A simpler process is to merely moisten tbe crushed and desiccated coffee herries with water, expose them three or four days to the air, and extract the coloring matter by means of alcobol.

A New Writing Multiplier.—A new arrangement for multiplying writing, called the hectograph, has recently been invented in Germany. The hectograph consists of a flat sheet-iron box filled with a gluey mass, upon which, after moistening and drying it several times, a sheet of paper, written upon with a specially prepared ink, is placed and lightly rubbed with the hand. When the paper is raised the writing is found to be transferred reversed to the film of glue, and from tbat film, by simply placing pieces of dry paper upon it and rubbing them, some 50 impressions of tbe writing can be taken in a short time. The negative impression can easily be removed from the film by washing witb warm water, and the latter can be used over and over again for a long time.

Requirements of a Good Boiler Water.—Mr. W. F. K. Stock, in a recent communication to tbe *Chemical News*, defines tbe requirements of a good boiler water in tbe following terms: It should be characterized by: 1. Freedom from any very appreciable quantity of suspended mineral matter. 2. Absence of any trace of mineral acids, or of acid salts, or corrosive salts of any kind. 3. Absence of oily or fatty substances of any kind. 4. And, finally, a good boiler wator sbould not contain more than 30 grains of solid matter per gallon, and not more than the half of this quantity ehould precipitate on boiling under pressure.

How to See the Wind.—Take a polished metallic surface of two feet or more, with a straight edge—a large hand-saw will answer the purpose. Take a windy day, whether hot or cold, clear or cloudy, ouly let it not rain or the air he murky; in other words let the air be dry and clear, but this is not essential. Hold your metallic surface at right angles to the direction of the wiud—*i. e.*, if the wind is north, hold your surface east and west, but instead of holding the surface vertical, incline it about 45° to the horizon, so that the wind striking glances and flows over the edge (keeping it straight) as water over a dam. Now sight carefully over the edge at some minute and sharply defined object, and you will see the air flow over as water flows over a dam. Make your observations carefully, and you will hardly fail to see the air, no matter how cold; the result is even better when the sun is obscured.

Cinder Wool.—A German writer relates his experience with cinder wool as an anti-heat conductor for steam pipes, which tends to show that it is by no meaos indifferent from what material the wool is made. After the pipes had been covered with wool for two years, they were found to be much corroded, and the woolly fibers had become a sintered mass resembling mortar, a change which is probably due to the action of sulphide of calcium.

Good Health.

Excessive Brain Work.

One of the clergymen of Worcester, Mass., in the course of a sermon recently, uttered tbe following cautionary suggestione in regard to immoderate brain work:

"It is a lesson we are all slow to learn—one that has to be enforced by an occasional tbrilling fact—that the most robust physique has its limit of exertion, that well compacted and toughened mental fiber may succumb to undue stress at a single point. A piece of steel wire can bear only a given amount of longitudinal tension. Beyond that limit it snaps. By the annealiug process of intense study or application to exacting business a man's brain gets toughened. It can bear an immense, prolonged strain, but there is an unknown terminus of your powers; exceed that point and the subtle thread of reason snaps. A ruptured capillary on the brain paralyzes that center of thought, and the stalwart, brilliant man of yesterday, full of bope, projecting grand schemes, the pillar of strength to bis family, tbe pride of many, the possible envy of more, is to day an enfeebled or quite broken down victim of intemperate brain work. You might charge me witb au exaggerated idea of tbe perils of overexertion among business men, did not facts justify all I have suggested. Have we not seen some of the brigbtest stars in the cluster of enterprising citizens, of which we are justly proud, wander from their orbit of reason and pass, unless God shall disappoint our fears, into the sbadow of permanent mental eclipse? The saddest feature of this phenomenon is that it seems to fall upon the highly organized, generous, sympathetic natures first. A cold-blooded, grasping Shylock, who cares little for the good name so highly prized by another, appears to be in no danger of such a calamity. Better far to confess poverty, be an honest bankrupt, than be broken down in body or mind under too great exertion to avoid the calamity. Witb emotions of unspeakable pity for every man barassed by his unsatisfactory affairs, I turn to expostulate with the coming generation. Keep a sound mind in a sound body. Do be contented with 'things honest,' with comfortable mediocrity. Husband tbe stock of physical and mental life God has given you, that you may not grow prematurely old—uselese before your time."

Care of the Health.—Health, by some eminent writer, bas been described as "the poor man's blessing—tbe rich man'e bliss." Witb it the most brilliant eudowment of mind, tbe most careful and tborough culture, are of little account in a life-career. In this view early instructiou in all tbat appertains to our physical well being is of prime importance. The earnestness with which some men have stood forth in the van of this cause will be better understood and appreciated in the future tban it is to-day. A distinguished physician pertineutly said, in a recent discussion: "Modern science, in connection with the most advanced views of education, is teaching us more and more every year, the importance of good bealth—of a sound constitution, in order to secure the higbest success in life; and this depends very much upon the proper care and training of the body in youtb. It is becoming evident that physical culture is to occupy a far more prominent position in all our systems of education than beretofore, and must ere long be introduced in some form into tbe regular exercises of all our scbools, seminaries, and higher institutions of learning. We venture this prediction, tbat in no department of educatiou will there be greater improvement for the uext 50 years, tban in a more perfect development of the buman system and harmony of function, between the laws that govern both the mind and the body."

Constipation.

It is doubtful if consumption numbers as many victims that aro stricken down by tbe various diseases that result from habitual constipation. True consumption is an inherited disease. It may remain always dormant, but wheu aroused to action, decay commences at a point circumscribed, and gradually extends—uuless arrested—until so much of the lungs becomo involved that vital action ceases. The evils of constipation result from inattention to the calls of uature, and usually commence witb children whose habits are uot closely looked to by their parents. The processes of nature are always active while life lasts. Wheu effete matter is retained a moment beyond the time its expulsion is demauded, the system commences its efforts to get rid of it. When the natural egress is checked, the absorbents carry the more fluid portions of tbe poisonous mass into the circulation, and it becomes diffused throughout the body. Tbe more solid or clay-like portion is forced into the lower rectum where it becomes firmly impacted, thus cutting off the circulation iu the small blood vessels, causing painful engorgement known as piles and hemorrhoids. A continuance of these troublee ofteu results in fissure, fistula, or cancer. Tho trouble is seldom confined here. As a result of the blood poisoning we almost invariably find more or less dyspepsia, with decided deraugement of the functione of the heart, liver and kidneys, accompained by headache and nervous debility, often verging on paralysis.

Arsenic in Starch—A Singular Case of Poisoning.—For some weeks past a local physician bas been attending a young lady who has exhibited every possible indicatiou of arsenic poison. Her appetite failed her, and her face became of a ghastly pallor, while the features were bloated and the eyee watery, witb swelling of tbe lower limbs. Day by day her body was racked witb intense paiu, and finally her condition became so unendurable that she almost longed for death to put an end to her sufferings. Tbe physician was satisfied from the beginning that she was afflicted witb some disease produced by arsenic poison. But tbe most rigid investigation failed to reveal in what possible way it could have been administered to her. Her food was inspected, the water she drank was most carefully selected from the wells, where no impurity by any means could find its way to it. By the merest accident in the world tbe cause of this remarkable condition was discovered. The doctor happened to be present when tbe young lady's clothes were brought from tbe wash. The singular luster of the linen struck him as remarkable. He inquired who did tbat washing, and was told that an old negro woman whose great skill in polishing linen made her very popular with tho girls. The doctor thought he was now on the road to the discovery, and concluded for tbe nonce to play an amateur detective. He visited the old woman, and soon learned that her "polish" was produced by tbe use of arsenic in the starch. Then the whole case was plain. Tho girl was afflicted by arsenic poison, produced by absorbtion. Being of a peculiar temperament and organization, she incurred a danger which others might have escaped. Respiration aided it, and her bodily susceptibility to the fatal drug conspired to produce the dangerous condition which has just been detailed.—*Denver (Col.) News.*

Poultices.—The common practice in making poultices of mixing the linseed-meal with hot water, and applying them directly to the skin, is quite wrong; because, if we do not wish to burn the patient, we mnst wait until a great portion of the heat has been lost. The proper method is to take a flannel bag (the size of the poultice required); to fill tbis with the linseed poultice as hot as it can possibly be made, and to put between this and the skin a second piece of flannel, so that tbere shall be at least two thicknesses of flaunel between the skin and the poultice itself. Above the poultice should be placed more flannel, or a piece of cotton wool, to prevent it from getting cold. By this metbod we are able to apply the linseed-meal boiling hot, without burning the patient, and the heat, gradually diffusing through the flannel, affords a grateful sense of relief which cannot be obtained by any other means. There are few ways in which such marked relief is given to abdominal pain as by tbe application of a poultice in this manner.

Antiquated Sausages Poisonous. — A few days since two boys named Michael and David McCarthy, aged respectively seven and four years, children of Michael McCarthy, who resides at 19 Ridley street, were taken seriously ill witb violent pains in the bowels. Dr. W. R. G. Samuels was summoned and administered an emetic, but without result in the case of tbe elder boy. Artificial measures were resorted to, and a large quantity of partially digested sausage meat was brought up. The emptying of the stomacb seemed to give relief, and upon a warm mustard bath being administered, the boys were placed in bed, and, though still very sick, appear to be recovering. A piece of the sausage meat, now in possession of the father, shows signs of decomposition, and on analysis Dr. Samuels believes the fatty portion will be found to bave undergone a chemical change, rendering the food poisonous and unsuitable for use.—*S. F. Call.*

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, March 8, 1879.

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The Week.

This week has seen the close of the 45th Congress and the adjournment of the Constitutional Convention. The former failing to finish its business, concerning important appropriations and other matters, has been summoned to extra session by Presidential message, and already the signs of partisan management and intrigues, for the control of either House, are plainly visible. The latter after sitting far beyond the time allowed to it, has given to us a new Constitution, asking that it be considered well by every voter before the time of the May election. The Chinese bill has been vetoed. But the news, with one or two local exceptions, has been received very quietly throughout the State, and there has been no trouble or disturbance as a result. The early part of the week was bright, dry and pleasant, but the end brought us the most drenching storm of the season. Here, over three inches of rain fell inside of 36 hours. We only regret that its abundance failed to reach the lower counties, Fresno, Kern, etc. Wednesday night it blew a strong gale from the southeast, the heaviest, it is said, known on the coast for 20 years. The ministerial question is still troubling France, and the cabinet is on the verge of another crisis, and will probably all resign. Reno has been laid in ashes by a terrible fire, and Silver City has also suffered in the same way. The women lawyers have carried their points, and the directors of the law school have been ordered to admit them as students to that institution.

In one district of Sheffield, Eng., there are 4,000 persons destitute, and 400 families actually starving.

Mining Shares in the East.

Operations in the shares of mining companies on this coast are beginning to assume very respectable proportions in some of the Eastern cities, the heaviest business in this line having thus far been transacted in New York, where the shares have been listed at the Mining Exchange and at the New York Stock Exchange. With a view of availing themselves of the active market that it is expected will open there for this class of securities, a good many of these companies have already procured their shares to be placed on these boards, the probabilities being that a like course of procedure will soon be followed by a great many others. It seems, indeed, quite probable that the quantities of these shares to be remitted to the Atlantic sea-board will hereafter be large, swelling into such proportions perhaps that we will find it convenient to estimate them as they do their ores in Colorado—by the cord. These consignments though large are not without precedent; we import about the same amount of playing cards from the East.

The mining shares so tendered the Eastern public represent properties of every grade—good, bad and indifferent. The list includes mines situated in California, Arizona, Nevada; some, in fact, in almost every one of our Pacific States and Territories. There are Washoe stocks, Bodie stocks, Eureka stocks—the fancies and the mines of merit all being called. Nor are these transactions confined to the stock boards; the bankers are beginning to deal in them, while numerous heavily-loaded private parties peddle them out, or sell as opportunity may offer, in lots to suit.

There is no reason why people in the East should not buy and sell these mining shares the same as is done on this coast. It is a business that in no case rests upon exact knowledge, or even upon very reliable information. Purchasers in Boston, Chicago and New York enjoy about the same facilities for posting themselves in regard to the condition, prospects and management of the mines that we do here. With the masses it is a chequered and hazardous business at best, more likely to bring them, in the long run, losses than gains, as the experience of outside dealers on this side of the continent fully establishes. There is no calculating the harm that our people have suffered from speculating in this class of so-called securities. It has caused the impoverishment—the utter financial ruin of thousands. It has led to more breaches of trust, defalcations and suicides than any other one thing, to say nothing of the demoralizing effects exerted upon those who have managed to make money by it.

But for all this it will go on. It will even grow and spread into communities that as yet have been comparatively free from it. When the poet wrote, "Hope springs eternal in the human breast," he meant, of course, the hope of making money by buying lottery tickets and speculating in public stocks. The propensity to make money through the instrumentality of chance seems innate and ineradicable. Reproof, admonition and argument are therefore unavailing to its repression. In this view of the matter, we expect to see these Eastern communities in due time properly entbused over our mining shares—to find in the cities there many prosperous brokers with each a numerous clientage—stock exchanges and a "booming market." The thing must have its day there as it has had here; for be it remarked, we on this side, are pretty well cured of this craze, and are about to advance our mining industries to a higher plane. There is a growing purpose among investors here to have done with stock speculations and embark in the business of mining in a practical and sensible way. The era of irresponsible managements, of well-paid but useless directors, and of merciless and misapplied assessments draws towards its close. Our people are not likely to be robbed through this gaudy machinery much longer. We have in our mines an inheritance of wealth such as never before fell to the lot of any people. All classes here are beginning to awaken to a consciousness of this fact, and it will not be long until we shall see a greatly increased activity in every branch of this industry. After many years of experiment and failure, of losses and mistakes, we have learned the business of mining for the precious metals pretty well. This knowledge has cost us dearly, but it will pay well in the end. We shall do our work with more economy and thoroughness and every way better hereafter, and do a great deal more of it too. There is going to be a good deal of money made at gold and silver mining on this coast from this time forward, and, as a general thing, it is going to be made in a more honest and legitimate way than has heretofore been the case.

The opportunities for employing money in this business are incomparable and boundless. There are here chances for the safe and profitable investment of all the surplus capital, not only of the Eastern States but of Europe, those who now invest having the benefit of our long experience, acquired skill and improvements introduced into the business. But, inviting as the field is to enterprise and capital, it is hardly to be expected that the opportunities it presents will just yet meet with entire appreciation abroad. Novices must be schooled to the business as we have been; must enjoy first the excitements of the stock bourse; try their hands at getting up corners, pools and deals; selling shares short and selling them long; traveling this road to the end, when it may be expected they will be ready to give their attention to and embark their means in actual and productive mining as we have done.

As yet, the majority of these Eastern purchasers seem inclined to pursue a cautious policy, showing a preference for the shares of improved dividend-paying properties of good standing and merit. This, for the time being, will no doubt be their best course, though it will not be long, once this preference is known, till mine owners will be found exerting themselves in a special way to bring their properties into this condition at the hazard of an early relapse into a non-productive state. Whatever is offered on the Eastern market, whether it be stocks or mines themselves, cannot be too closely scrutinized. As remarked by us last week, a multitude of irresponsible adventurers have lately made their way East loaded down with worthless shares and unproven mining claims with a view to disposing of them at almost any price. Much of this rubbish will be presented in a shape calculated to attract and deceive, being backed by glowing reports, newspaper articles, etc. But despite their goodly appearance there will be found concealed under these heaps of meal innumerable cats of the undomesticated species.

With so much that will be offered to Eastern investors of a dangerous kind, there will also be presented a great many properties worthy of acceptance; our object in this writing being to impress upon investors there the necessity that exists for discriminating between these respective offerings. In the gravel mines of California, both hydraulic and drift, should such be put on the Eastern market, investors may, as a general thing, embark their means with considerable safety, provided, of course, that these claims be opened and outfitted, supplied with water and otherwise favorably conditioned for active operations. Under other circumstances the most of these are properties to be avoided. It is the case, too, that vein mining in this State has, as a whole, been attended with satisfactory results. The failures that have here occurred, however, in this branch of mining are a standing protest against any relaxation of vigilance on the part of those who may contemplate engaging in the business. And so we might go on through a whole chapter, canvassing the inducements and dangers that everywhere attend mining investments without advancing our argument further than this: that our mineral fields present first rate opportunities for making as well as losing money, accordingly as they are turned to good or bad account. We have made here, as we will probably continue to make, great successes and great failures, though the latter, there is reason to believe, will be of less frequent occurrence hereafter than they have been in the past. In the future the chances of success will favor the operative miner rather than the speculator in stocks, the practical branch of the business being marked every year by less and less fluctuation, uncertainty and exposure to loss. To recapitulate a little, it will be seen that we have on this coast mineral resources almost without limit; toward the profitable utilization of these resources we have made great progress, having pretty well overcome the difficulties that for a long time beset the business. Our natural advantages aided by our acquired knowledge invite investments from abroad, all that is necessary to make mining here a success, being the observance of the same prudence, foresight and care that are considered indispensable in every other branch of business.

The Reno Fire.

Since the great fire in Virginia City, there has been no conflagration on the coast so sweeping and disastrous as that at Reno, Nevada, on Sunday last. It broke out at sunrise and raged all day till a late hour at night. One of those sweeping Washoe gales was blowing, and this combined with the scarcity of water, rendered it impossible to stop the work of destruction, till nearly the whole town was laid in ashes. Nearly 350 buildings, valued at from $750,000 to $1,000,000, were consumed. Of this amount, $200,000 only, is covered by insurance. Five lives are known to be lost so far—one woman and four men. Three of the latter were tramps. The fire is supposed to have originated in a woodpile near some frame dwellings. Once started, however, the high wind carried it with irresistible force from building to building, and so swiftly that the inhabitants had barely time to escape with their lives, saving, at the most, but a handful of their effects. Some of the heretofore well-to-do families in the city are reduced to poverty, and many of the poorer people have been left in an absolutely destitute condition. All the business portion of the town was destroyed, together with many dwellings. One hotel remained standing, and this together with such dwellings as had escaped, served as a refuge for the homeless and houseless people wandering in the streets.

Relief trains were promptly sent from Virginia, loaded with clothes and provisions. Further supplies were forwarded from this city, and on last reports the distress had been somewhat relieved. Steps were immediately taken to rebuild the burnt district, and many houses have already sprung up. Reno is now a suburb without a city, for this fire has swept away all those accumulations which distinguish it from the mining camp it was 10 years ago.

The Impolicy of Labor Strikes and How to Prevent Them.

The late striks in the Bodie district appears to have subsided, the mechanics and laborers receding from their demands and the employers carrying their points, as usually happens in similar cases. The most of the recent great strikes in England, New York and elsewhere have reached a like result; the workingmen, after refusing to comply with the terms offered by their employers as long as they could stand it, being at last forced to given in. An enlarged and dispassionate view of this subject reveals the fact that there is in the present condition of things much hardship involved on both sides. Take, for example, the case as presented in the Bodie district: Considering the remoteness of the locality, the cost of living, the rigors of the climate and the arduous and sometimes dangerous nature of the service required of the laborer, the wages demanded by him seem by no means excessive. On the other hand, there are here only two or three mines that are yielding the owners any present income; all the work and money expended upon the others is being done simply in the hope of striking something of value, but always at the imminent hazard of the whole being lost. Their value is merely prospective; the chances, if we consult past experience, being as ten to one that they will prove failures in the end. In attempting to develop these properties the owners, many of whom are persons of small means, run a great risk of loosing all the money they put in. In most cases it will be a long time anyhow before they will realize anything on their investments. Men working in and about these mines should consider these things, and not be too exorbitant in the matter of wages, nor otherwise exacting in their demands; remembering that but for the enterprise of these investors, attended so often by pecuniary loss, they would themselves be without these opportunities for earning even moderate wages.

And so, in looking over the world generally, while we find the laboring classes willing to work for a mere pittance, everywhere poor and often reduced to the verge of starvation, we find on the other hand financial embarrassment, ruin, bankruptcy, and prostrate trade, resulting from over-production in every branch of manufacture and department of business. At first sight it would look as if there were too many people in the world wanting employment for the work to be done. Yet such is not the case, the trouble being that there is too much conflict between the employer and employee, involving loss of time, energy and earnings on the part of the latter, and of skill, care and capital invested on the part of the former.

What is required is the adoption of some plan whereby these losses could all round be avoided; some method by which these classes would be able to consider and equitably adjust their differences without recourse to these labor combinations and strikes, which, while they produce so much bad feeling, result so disastrously to labor in the end. It seems to us that courts or boards of conciliation and arbitration, such as have in some places been introduced with excellent effect, might be more generally instituted for disposing of all questions arising between employers and employees in a speedy and inexpensive way. The findings of these boards, one of which might be established at every considerable mining camp or other labor center, would be likely to give general satisfaction, almost all men preferring to yield something even of their just claims to standing out for the last cent at the hazard of loosing valuable time and perpetuating a feeling of enmity and strife. We invite the attention of all parties concerned to this suggestion, satisfied that the plan proposed for settling their differences will, when they come to reflect upon it, appear so rational and practicable that they will at once set about organizing something of the kind.

Powder Blasts Here and in the East.—It is stated in a late number of the *Engineering and Mining Journal* that a blast of 12,000 pounds of powder had just been exploded in the quarry of the Glendon Iron Co., near Easton, Pa.; that paper going on to remark that this was probably the heaviest charge, not sub-aqueous, ever fired in the country; that it was an entire success, having effected an estimated displacement of 60,000 tons of rock, etc. While the above may be the largest blast ever set off in the Eastern States, much larger are frequently exploded in the gravel mines of California, where they sometimes burn five or six times as much powder as this at a single charge. Very recently the Reservoir Ditch Co. put off in their mine, at Sucker Flat, Yuba county, a blast of 50,000 pounds of Judson powder, a very powerful explosive, and by which between 200,000 and 300,000 cubic yards of gravel, some of it indurated into a hard cement, were so shattered that the most of it can be piped off under the heavy head of water here used. Occasionally even a greater amount of powder than this is exploded by the larger hydraulic mining companies, who find it economical to employ these heavy charges as doing more proportionate execution than small ones.

The value of the iron and steel exported from Philadelphia last year is put down at $3,000,000.

(Continued from page 150.)

qnske was experienced in this city and Oakland. Whether it had anything to do with the muddy water, is a qucstion. Dr. Saxe, from Santa Clara, ons of nur members, informs ms that soms walls in his vicinity that a year or two ago had flowed for a long time, suddsnly becsme muddy, and in a short time useless. His theory is, that ths force of the underground stream rushing to the bottom of the pipe to find an egress, collected ths pebbles aud larger gravsl in a pile around the pipe, and ths force of the water undsrmining the stratum abovc, it choked the pipe and prevented the flow of water.

An Unsuccessful Well.

In Septsmber, Morgsn & Co. bored a second well in ths hay, at their Millbrae station, the water in the bay bsing about 10 feet deep. Tho well was constructed in the same manner as their Dumbarton wcll; and after passing through mud, and the different strata of clay, gravel and sand, at 275 fect the auger penetrated a hard rock four feet, and no water having been obtained the well was abandoned, and the pipe taken up. Nnw draw a lino from point San Bruno (a hill on the main land 205 feet high), to point San Mateo (ths top of a small rocky hill projecting above the salt marsb), and the line passss east of the well, leaving a crssssnt-shaped bay to ths west. I think that ths well is on a submerged ridge, a continuation of the San Bruno mountains, which have an slevation of about 1,300 feet; and that San Mateo point is ths last low hill to ths south visibls on that ridge. The specimen marked *D*, of hard rock from this well, appears to bs hard cement gravel. The sams firm then commenced a third well at their Belmont station, which you will recollect is on a small island. This well, lately finished, is 358 fest deep, the last 15 fsst being sand, in which a good stream of water was obtainsd, thought to be better than at tbe Dumbarton station, which is hard; aud this is soft. At 308 feet, in ths Belmont wsll, passed through fragments of small shells one foot thick (see specimen *E*). A mils and a half south of the Belmont wsll, is one on the salt marsh, near the month of Redwood creek, sunk by McCollam & Co., on thsir former location, for curing Alaska codfish. This well is 7-inch bore, 202 feet deep, and flows a good stream of fresh water four feet abovs ths surface. These two last wells ars two or thres miles east of what I suppose to he thc submerged ridge.

Notk.—Mr. Morgan has furnished ms with the jaw of a sting ray, showing the peculiar formation of the mouth, which snables it to crush ths shell, and suck out ths oyster. He says that it is the only fish in this hay that destroys ths oyster. This jaw is from a small sized fish. The fence is mads of two by six-inch scantling, driven into the mud one foot apart, leaving six or eight feet above ths mud. The ray heing a flat round fish two feet or mors in diameter, and keeping near the bottom, cannot get through, and does not swim over the fence. Thsy are not to bs found now; but come again in the spring.

Diagram C

Is a cross section from San Francisco to Stockton and Milton, at the foothills of the Sierra Nevada. The observer is supposed to be looking north. The Pacific ocean and San Francisco are shown at ths left; then to ths east of San Francisco, the hay and Oakland; also, Redwood peak, 1,635 feet high; San Ramon valley, about 500 fest; Monts Diablo, 3,856 feet; Cave peak, 2,078 feet; the town of Livermore, 485 feet. Then ths delta of ths San Joaquin, 16 miles wids, which is overflowed at high tide; then comes Stockton, only 23 feet above the sea. (At a low stage of the river, ths tids rises and falls here two and one-half to three feet.) Now, at the intereection of Montgomery and Market streets, ths elsvation above the sea is 30 feet, or seven fest higher than Stockton. Milton, ths terminus of the Copperopolis railroad, elevation, 260 feet, is situated at the foothills of the Sierra Nevada.

Following are figures referred to in diagram *C*: 1, San Francisco; 2, Oakland; 3, Redwood peak, 1,635 feet; 4, San Ramon valley; 5, Mt. Diablo, 3,856 feet; 6, Livermore, 485 feet; 7, 7, 7, delta of the San Joaquin river; 8, Stockton well, 1,002 feet; 9, Milton, elevation 260 feet; 10, foothills of the Sierra Nevada; 11 to 12, level of the sea.

Tho line drawn east from San Francisco reprcsente the level of the sea. At San Francisco six wells are here shown: Three in the sandetone above the city hase, and three in the alluvial deposit below. These last are, the Stevens well, 144 feet deep; the Grand Hotel, 230 feet; and the well, 260 feet deep, at the Pacific Iron Works. The deepest part of the bay, just west of Yerba Buena island, is 144 feet.

At the railroad machine shop at Oakland point, a well, bored hy the company, is also shown. About 330 feet is passed through the alluvial soil without obtaining water. It now penetrated what is termed in the record, blue soapstone, 35 feet; then, soapstone, 18 feet; gravel, sand and clay, 4 feet; hlue soapstone, 16 feet. Most of the balance of the depth was alternate veins of soapstone and narrow seams of sand or gravel. At 454 feet a small quantity of water was obtained. At 550 feet, a hard, gray, arenaceous limestone was encountered; it was 20 feet thick. Below this limestone was 20 feet of very hard silicious rock. Lower down, the auger passed through different etrata of soapstone, elate, and other rocks, to the depth of 715 feet. No water having hesn obtained, the well was abandoned. I think that this well penetrated a submerged ridge from the hills east nf Oakland.

Stockton Well.

In tbe early part of 1858, the Stockton well was complsted. It was bored by the city and county authoritics (at a cost of $10,000), to test the practicability of obtaining a good stream of water; and, bsing a success, the county's interest was purchased by the city, and they now have a good supply of water for the inhabitants. My office at ths time, heing in the Court-house, within 100 fect of the well, enablsd mc to watch it closely, and I have a full recor.d of the well. The depth is 1,002 feet, through alluvial soil all of the distance. At the depth of 92 feet, a stratum of clay, sand and gravel, two fect thick, sligbtly impregnated with gold. At 340 fest, rsdwood log, in 14 feet of coarse sand, and water ascended to thres fest nf the surface. At 560 feet, in a stratum of fine, gray sand, 42 feet thick, obtained a stream of water, rising fivs feet abovs ths surface. At 913 fcet, entered stratum of clay and sand, 11 feet thick, and a large stream of water ross ssvsn feet above surface. At 1,000 feet (the last 11 fcet being clay, gravel and mica), entered two fset in sand, when a largs stream of water rose 11 feet above the surface of the plain and nine fest abovs ths city grads. Temperature of watsr, 77° Fahr.

Assisted by three gentlcmen, I carefully measured the water, and found ths discharge at the surface, through a nine-inch pips, to bs about 500,000 gallons in 24 hours. Ths water is charged with two gases, or, rather, tbe gases come up with the water, supposed by Dr. Trask and myself to he carhonic oxide and carbonic acid gas. I proposed to the Supervisors to elevate the watsr to the highest buildings hy mcans of the gas, and proved it ou a small scale, but they did not agres to it. I bottled soms of the gss, and kept it for six months; then opened the bottls and applied a light. It would not burn, but on turning the bottle over, it poured out like water and blazed up around the bottle.

With regard to the Stockton well, it is shown to be entirely in alluvial deposits to the depth of 1,000 feet. How much deeper this extends is not known. The pips to measure the hight of the water was 11 feet above the city grads; the water rose nine feet, and the gas, collected in the pips above the water, when a light was applisd to it, would burn with a flame about 18 inchee above the pips.

But it is evident from this and the small head that the water flowing from the well has, that its source is not in the Sierra Nevada, but is derived from the reservoirs in the different strata of sand or gravel in the basin between the foothills of the Coast range and Sierra Nevada. For it is well known that all of the emall streams and a portion of the larger streams eink as soon as they reach the deposits of large gravel in the plains at the base of the hills.

How, therefore, can we expect to obtain water from the Sierra Nevada under San Francisco at a depth of 200 or 300 feet, or even 1,000 feet? It is impossihle. All that we have obtaincd below the sea level is held in a small basin containing alluvial deposit.

Diagram D.

I will now call your attention to the enterprise of one of our citizens, Mr. J. B. Haggin, who has been engaged about two years in constructing an artesian well near the railroad, nine miles north of Sacramento, on the Norris grant. The elevation above the sea is about 150 feet, and about 8 or 10 miles west of the foothills.

In a letter to the Academy, dated May 3d, 1877, from Mr. D. C. Patten (who is boring the well), he says: We evidently passed through all surface strata at a depth of 864 feet; from this depth down to 1,090 feet is a conglomerate vein of soapstone, 226 feet in thickness, varying in character throughout, and coutaining one or two thin veins of lignite. Mr. Patten is keeping a record which will be furnished us when the wsll is finished.

Mr. Haggin informs ms that the well has reached a depth of 2,107 feet, and is now in qnicksand, with watsr rising to within 30 fest of surface; also gas sufficient to burn freely in a half-inch pipe. I think it very probahls that a stream of water will be obtained from ths Sierra Nevada, having ths best head of any well in the Stats; flowing, perhaps, 50 feet or mors abovs the surface. The well has cost nver $20,000.

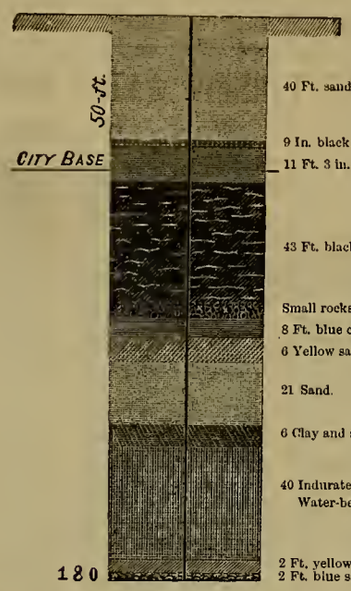
Ths specimens ssnt from this well called soapstone ars not soapstone, hut indurated clay.

Dr. W. Harknsss, who was at this wsll on Saturday, Dccember 14th, 1878, prssented ths Academy with soms sand obtained at the depth of 2,108 feet. Also stating that the water ross, as mentioned above, to 30 feet of the surface; but at times would suddsnly fall from 30 to 50 feet, and again suddsnly riss to its formsr lsvel. This will be further examined and reported.

In November, 1875, I received a report from Mr. F. C. Chass of a well that hc was boring at the Marysville woolen mills. The elevation of Marysvills above the sea is 67 feet. At 76 fest the auger cut the sids of a log 20 inches in diameter. At 195 fest, water so salt that stock would not drink it. At 285 fest, a small pisce of wood. At 306 feet, no supply of water yst.

I do not know to what depth this well was completed. Mr. Chase promised to write again, hut I havs not heard from him since.

I will now give a short account of one of the most remarkable artesian wells in ths United States; remarkahle for several reasons. First, the comparatively low depth at which a large stream of water was obtained; second, the head or force with which it comes to the surfacs, and the quantity discharged; third, the fact that the location is in a plain nearly level, and surrounded hy a lsvel country for many hundreds of miles; fourth, ths low temperature of the water; and fifth, that, with a single excsption, the boring was continned through ths rock all the way down, and was completed in 10 months. I have had a record of this well for several years.



New Artesian Well at the City Hall. Bore, 14 Inches. Scale, 50 ft. to 1 inch.

Stevenot's Free Gold Amalgamator.

The New City Hall Well.

Since this paper was written, the new well at the City Hall has heen completed to the depth of 180 feet, and work on it has been stopped for the present. I have, therefore, added it to diagram *A*; and also show it on a larger scale in diagram *E*. The location of the well is just east of the line of Hyde street, or three blocks east of Mr. Lyle's well (about 1,600 feet), which you perceive brings it on the east side of the basin formed between Gough and Leavenworth streets; but it is south of McAllister street or abont 4,000 feet south of California street. At the depth of 136 fset, ths indurated sand, or water-hsaring stratum, was reached. This is nnly 40 fset thick; when at the Lyle well it was 80 fest. It is therefore only capable of containing half ths amount of water. The bottom of this indurated sand is 150 fest hslow the bottom of ths 80 fsst in ths Lyls wsll, and if the water-bearing stratum nf the two wells are connected by a stream, the water in the City Hall well should raise considerably abovs ths surfaco, whereas it only just rsaches that point, or about 80 feet below the water lsvsl of ths three wells in diagram *B*. Theorstically, water rises to the level of its fountain head; hut practically it falls much short of it, owing to the friction and other causes.

The lower two fest of this well is said to bs in a hard, blue clay, containing small pieces of blus rock (specimens marked *F*). But it is probable that it is the bedrock cut fins hy the auger and bringing up some small pieces uncut. I gave some of ths rock to Prof. Price to examine, and he will report on them.

As was stated before, the last outcrop of tbe serpentins was traced to McAllister street. Ths next outcrop that I have seen is on Potrero street, about 5,000 feet sonthwesterly of the outcrop at McAllister strsst, and on the sams line of direction. This serpsntine may underlis the City Hall, the outcrop bsing about 1,700 feet west of it. But it will require further investigation.

In conclusion, I will say that if it is acceptable I will, at some futurs meeting of our section, give ths results of some of my observations during my surveys in different parts of the California basin, and the probable dspth of ths great inland ssa by which it was once covered.

Stevenot's Free Gold Amalgamator.

It is well known by svsry ouc who has had experience in quartz milling that a great deal of the fine gold contained in the pulverized gold ores is floated and carried off by water, on account of not getting in contact with ths quicksilver covering the copper plates of a quartz mill.

The following described amalgamator is intended for saving such fine gold, ths pulp bsing forcsd through a quicksilver bath, by which the fine gold is compelled to come in contact with the quicksilver. No machinery is required to givs ths pulp ths mechanical motion, the rotation being communicated to it by the currsnts of water hrought in contact by diffsrent pipes and under a certain amount of prssure, ths streams bsing rsgulated to suit the work by a stop-cock on each pipe.

Ths amalgamstor is composed of a shest-iron vat, which is 36 inches in diameter at ths top, 9 inches diamstar at ths bottom, and 36 inches deep. A pips four inches in diameter and seven feet long, with a hopper or funnel, 12 inches square at the top by 6 inches deep, servss to fsed ths ore in, by the top of ths funnel, being 24 inches highsr than the top of the vat. A one-inch water pipe insids of the feed pips, supplied hy a water tank with prssure, brings the gold and quieksilver in contact with such a shock as to compel the latter to taks hold of ths gold as the sand is forced through the quicksilver and raised to the surface of the hath in the vat. The vat or bowl being constantly full of water, the tailings therein are kept constantly stirred up and in motion by currents of water brought in by three-quarter-inch pipes, supplied by the water tank, the pressure producing the rotary motion in the vat. The tailings and surplus water run off hy the top dischargs or spout on the upper edge of the vat.

The pipes leading down into the vat, the water through which keep the contents stirred, are provided with stop-cocks, so as to produce a strong or light motion, which rsgulates the discharge of the sand. Plug or dischargs holes are made in the side of the vat, which are kept closed during the working and used to run down the heavier sand.

The level of the quicksilver hath in the amalgamator is indicatsd by the dotted lines as shown at *A* in the engraving. To clean-up the pipe in the bottom the vat is opened and the quicksilver will all run out. When a new charge of quicksilver is put in, the machine is ready to run again. It will only be necessary to renew the quicksilver once every two or three days, according to the richness of the ore. A 36-inch vat with a four-inch pipe is calculated to do the work for 10 stamps. This would make an extremely cheap amalgamator, very light for transportation, and having no machinery likely to get out of order.

The stream of water in the pipe which comee down throngh the feed tube takes the ore in said feed tuhe and throws it in fine particles on to the surface of the mercury hath so forcibly as to drive off any slimy particles which may he adhering to the gold, thus cleaning it and admitting of perfect amalgamation. Then as the particles of pulp are forced through the bath and rise in the vat, all the gold contained in it is amalgamated and the tailings flow off as described. The inventor, Mr. E. K. Stevenot, mining engineer, 322 Montgomery street, in this city, will furnish further information to those desiring it.

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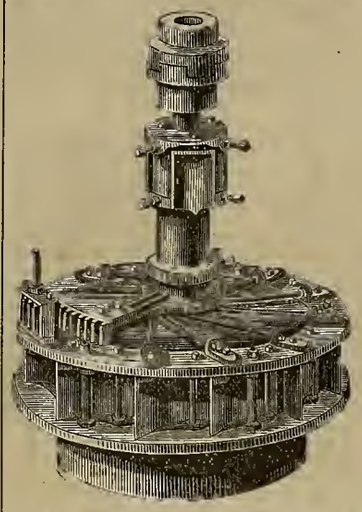

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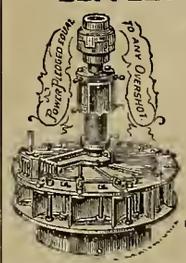

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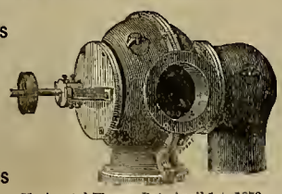

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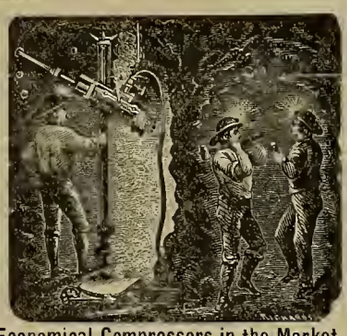

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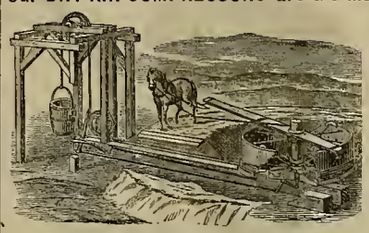

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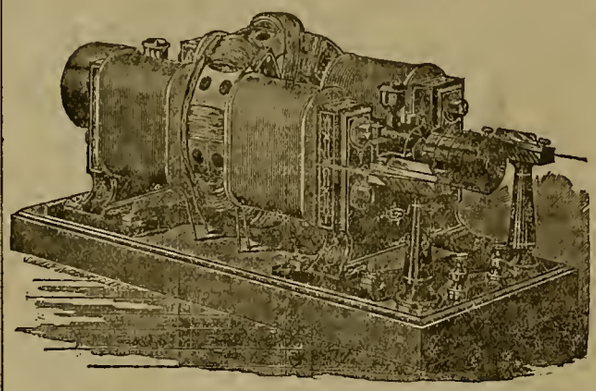

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[Continued from page 149.]

moras. Late reports from the Reecue, at Silverado, confirm the report of a rich etrike. Tbe ore in the Needle mine ie increasing in value. It ie worked by two shifts.

REESE RIVER DISTRICT.

MANHATTAN.—*Reveille*, Mar. 1: The 517 west drift of the Curtis ehaft now carries a large ledge of very good ore, which seeme to improve in going up. The 660 stope also carriee the same ore on the west and below the 517 drift. The bottom ledge ie emaller, but containe fine ore. The 560 west drift having been run eome dietance ahead of the stope has been stopped. A chute, which ie being raised from the 600 weet drift to the 560, carries good ore. The 825 stope improves daily ae the ore body is opened out. The 825 east drift being quite a distance ahead of the ore chimney and the ventilation being bad, hae been stopped. Sinking the winze, in the North Star shaft, in the 600 west drift has been started, but it will be eome distance to the ledge.

WESTERN NYE.—Granteville *Sun*, Feb. 26: A diecovery bas been made in the lower south tunnel of the Alexander mine. This etrike is regarded as valuable becauee it ie helow the water line, and most clearly demonstratee the depth and permanency of the mine. At a depth of 244 ft a ledge of eulphuret ore has been discovered. The ledge has been prospected for seven ft, and as yet no eigns of a foot wall have been discovered. Tbe ore hitherto encountered in all the upper levels has been gray chloride and carbonate; at this point the ore body is changed to a heavy hlack eulphuret. The ore from thie ledge assays from $40 to $380 per ton.

COLORADO.

PHŒNIX-MAINE.—*Courier*, Feb. 28: Work at preeent on this property is confined to the two upper levels of the Coldstream ehaft where three parties of lesseee are at work. On the 60 level, Henry Stanton & Sone are working tbe east stope, that ehows an ore etreak from two to three inches thick that mills from 110 to 300 ouncee. On the eecond level, Cbris. Hanson & Co. are working a double shift drifting east, the hreast of their drift ehowing a etreak of ore that averagee ahout an iuch in thickness. Ben. Stanton & Co. are working the stope between the first and eecond levels, their ore being from two to six inchee thick but of a low grade—their last mill run dressed into one claes, giving but 65 ounces per ton. The company is erecting a California whim at this ehaft, ae the engine which was formerly here, bas been placed at the Phœnix shaft.

BACKSONE.—The main sbaft on thie lode, now 125 ft deep, is being eunk by Robert Woods & Co. under contract. Probably 40 ft farther will be reached before another level is started, wbicb will leave a block of ground for etoping between the first aud eecond levels 100 ft deep. Below the first level the sbaft ehows ore ite entire length, hut in placee carriee considerable iron. The bottom now showe about a dozen ore veins in the crevice, the largeet of which are from an iucb and a half to two inches in thicknese, compoeed of fine-grained galena.

THE Sunshine M. Co.'s mine, the Specie Payment, is producing as heavily ae ever. They are, however, piling up moet of the ore, their turbine wheel having given out several weeks ago. They bave their mill here full of ore, as well as enetom mill in Russell gulch, and will resume operations sbortly, ae they are expecting a new wheel on every train.

IDAHO.

SNAKE RIVER PLACERS.—*Statesman*, Feb. 20: Locatione of mining ground have been made from the confluence of the northern and eouthern branches of the great river, down to Glenn's ferry, 250 miles. Electro-plated machines are now being generally introduced. A Salt Lake company is located and working about five miles below Salmon Falls. It has a force of only four men at work, running day and night, with a result of $1.50 per hour for the two men engaged; the couples working alternately, each 12 hours. This company will put in another machine soon. A California company are putting in two machines. Charlee Lane is working two machines at Bonanza bar, 100 miles above the falls. Lane bas demonetrated that the high hars on the river pay about $4,000 per acre. All the hars tbat yield 25 or 30 colors to the pan pay from $35 to $40 per day. Some Salt Lake companies are at work on the south branch of the Snake river, about 40 or 50 miles above the mouth of that branch. About 120 miners' inches of water are required to work a machine of ordinary size. The price of the machines vary from $2,000 to $3,000. The gold ie worth about $21 per ounce; tbe gold being almoet pure. Only a small section of the river has yet been tested by the new procees; but it is known that the same character of gold is generally diffused throughout the gravel deposits along the entire length of the river.

BANNER.—Cor. *World*, Feb. 18: The boys at No. 2 are in 214 feet with their new tunnel, and this morning struck tbe porphyry, wbich lays on the foot wall of tbe ledge. The vein will be encountered to-day, and big things may be heard from this enterprise soon. A large stream of water is running from the face of tbe tunnel, which is indicative that all the old ehafts and stopes of Banner No. 1 are being drained.

UTAH.

NOTES.—Silver Reef *Miner*, Feb. 22: The Foundry and Iron mines have been purchased by Messrs. Campbell, Cullen & Co., tbe ore going from $20 to $60 in silver to the ton. The district ie known as the Silver Belt district. The foundry and minee will start up about the 1et of Marcb. Mr. Burgeee has put a force of men to work in his coal mine, and has considerable coal on the dump. Reports from tbe Salmon river mining country are more than favorable, and a good many Salt Lakere are preparing to locate there as soon ae the mining eeason opene. No unfavorable report eeems to have been made relative to the locality, and every prospect in course of development is turning out beyond the most eanguine expectatione. A doubt has existed as to tbe permanency of the mines, but so far the farther down tbe miners go the richer appears to be the ore. Tbe Stormont mill shut down for about 48 hours, to put in a set of new tanke. The Iron county excitement did not "pan out" worth a cent. The rock brought back ehowed no mineral. Tbe country rock wbcro the epecimens were obtained, is the variety generally known as the black volcanic, and bae never heen known to carry mineral of any kind.

SOME 20 persons are under indictment at Sprugfield for complicity in the whisky fraude. Many of them are the most prominent and wealthy citizene.

C. W. ANGELL, defaulting Secretary of the Pullman Palace Car Company, hae been eentenced to 10 years in the penitentiary.

A FIRE at Reno, on the 2d, destroyed 350 huildings, valued at $1,000,000. Five men and one woman perished in the flames.

WHEAT is coming forward at Portland in increased volume, and buyers willingly take all offered at current rates.

CHANNEL storms and snow drifts on the continent practically prevent postal communication with England.

THE rivers and creeks of southern Oregon which have connection with the ocean are filled with fine ealmon,

Arizona.

[Written for tbe PRESS.]

Notee of a Trip Through the Territory.

Ae we ehall leave this P. M. for California, or to go "inside" as they call it here, via Phenix and Maricopa Wells, we will make a few ohservatione ae to how we got here, what we have een and whom met.

Leaving San Francisco on Wedneeday, Jan. 8th, at 4 P. M., we sup at Lathrop and find oureelves at Mohave, on the desert of the same name, at breakfast. Thie ie a very bleak and desolate place, hut has coneiderable importance as the point of departure for the Lone Pine mining district and the country adjacent thereto. In this region the tree cactue ahounds and grows to a hight of twenty and thirty feet, throwing out its thick arms in a most grotesque way. It ie the Harleqnin of tree life. Ahout an hour hefore reaching Mohave we wind around the "Loop." Thie novelty in engineering ie 340 miles from San Francieco, ite length 3,795 feet, difference in elevatiou 78 feet. Between Caliente and Summit there are 17 tunnele, the longest of which is 1,300 feet. Leaving the desert we wind in and out through the Soledad pass aud through the San Fernando tunnel, which is as etraight as an arrow and 6,967 feet in length, down into the valley of San Fernando.

At Ravena, 51 miles north of Los Angeles, in the Soledad pass, ie located a mill for utilizing the cactus of this region hy working into paper. At a etation called Andrews, three milee eouth of Newhalle, ie located an oil well and a refinery. An attractive looking hotel ie also being built here, and we were informed that the etagee for Santa Barhara would eoon leave from thie point inetead of from Newhalle ae heretofore.

We had ahout an hour and a half at Loe Angelee for dinner, which was a great deal of time for the dinner provided. Leaving at ahout 3 P. M., we reached Yuma at 10 A. M., January 10th, three houre late. Fare from San Francisco to Yuma, $45, and $5 extra for eleeper. Breakfaeting at the "Colorado" we left on the "hnckhoard" at 11 A. M. for Preecott, via Castle Dome and Tyeour Welle; etage fare, $50.

As this route from Yuma to Preecott, for general travel, will soon be of the past we will note a few ohservatione concerning it. We arrived at Castle Dome ahout 5 P. M.; dietance from Yuma, 30 miles; one change of horees; time, eix houre. We forded the Gila soon after leaving Yuma, and the day'e ride was along the Colorado, through the meequit and greaeeweed, arrow-wood and palo verde, mostly over a eandy plain, monotonoue and nnintereeting, except for the changing views afforded hy the distant mountain rangee on both eidee of the river. We arrived at Tyeour on the morning of the 11th, nearly dead with the cold, which penetrated to the very marrow, notwithstanding our innumerable wrappings. Dietance from Castle Dome, 65 milee; time, 14 houre; two stagee of 30 and 35 miles. This line seeme to be hadly served. They run but two horeee to a etage, which, with the mails, express matter, coneiderable luggage aud three passeugers and driver is too much of a load over heavy roads for two horsee on long stages of 30 and 35 miles without change. Tysonr ie on the direct road from Ehrenherg, on the Colorado, to Prescott and Wickenherg, and is distant from the river 22 miles. Our course to thie point has been nearly north; here we change to the northeast. We reached Deeert etation, 28 miles from Tyeour, ahout 2 P. M., where we changed horses and lunched, arriving at Centennial station, 18 milee from Desert, ahout 7 P. M., making 46 miles for the day'e travel acrose the desert and over low ridgee, the monotony of the ride only hroken hy the storiee of adventure and exploit ae told hy "French Joe," a celehrated character in theee parts, whom we took up as an additional passenger at Tysour.

We arrived at Cave Creek at 4:30 A. M., after a night ride of 30 milee. We hardly had time to thaw out our etiffened fingers and swallow our miserable hreakfaet of fried hacon and heane hefore the "all ahoard" wae given for our last day's ride into Preecott. The road this day, mostly mountainous, leading acroee the ridges, up and down. Some 25 miles out from Prescott we struck into Kirkland valley, through which a sparkling stream of water runs, and cattle in considerahle numbere are grazing on either hand. Thie was the first hit of land we had eeen in 200 miles worth two hrass huttons. We dined at Dixon's etation at 2 P. M., where we got the only good meal on the road, and thie was good. Shortly after leaving Dixon's, fine timher begine to show itself upon the mountain sides. We have been gradually ascending all day and at 8 P. M. we reach Preecott (6,000 feet ahove the eea), 58 miles from Cave Creek; time, ahout 14 hours, and a total distance of 249 milee from Yuma; total time, 57 hours. We may eay here, in a general way, that traveling in the Territory is uncomfortable and expensive. Stage fares are from 20 to 25 cents a mile; meals, $1, and in the mountains $2.50 for keeping a horee over-night.

Upon arriving in Prescott we found the weather clear and cold, with eome snow. The Supreme Court and Legislature were hoth in seseion, which hrought together many of the representative men of the Territory. The Governor, General J. C. Fremont, and his family are very popular. He has hardly heen here long enough to have become personally known to many of hie widely ecattered conetituente, hut from hie early official connection with this coast, opening it upae it were for occupation hy the Americans, he has a strong hold upon the hearts of thie people. The Hon. Secretary, Captain Goeper, and the U. S. Marshal, Major Dake, hoth eerved with distinction in the war for the suppression of the rebellion, and are efficient in the discharge of their official dutiee and active in developing the material reeources of the Territory. Chief Juetice French, whose home is in Tuscon, has had a long experience upon the Bench, and is well and favorahly known throughout the Territory. A man of imposing presence and great dignity of character, Judge Porter, whose home is in Yuma, has heen seven years upon the Territorial Bench, and is well informed upon Territorial law, neuage and precedents and is in every way a valuable officer. Judge Chas. Sileut, the most recent appointment to the Bench of Arizona, ie from San Jose, California; is a clear headed lawyer aud an upright Judge. He has made a host of friends in the Territory hy introducing reforme in the administration of juetice, expediting the husineee of the court and reducing very materially its expensee.

Among the repreeentative men in the Legislature is the Hon. C. C. Bean, a memher of the council, who ie an old reeident in this part of the Territory and knows every road, trail, and etream in the Bradsbawe. He lovee the rugged mountain peaks and dark canyone and knowe them all hy name. He has traveled all over and through them and the country is like an old map to him. He ie largely engaged in mining and has done much to develop the mining intereete of the country and takes a broad view regarding the opening up of the country to capital and population.

In a future letter I may give your readers eome further information concerning the general resources and condition of Arizona, and then tell them my impreseione of ite mineral wealth.

W. H. S.

Prescott, A. T., Feh. 12th, 1879.

News in Brief.

NEVADA has a female hermit.

THERE ie 15 feet of snow in Schleswig.

IN 1878 the Parisiane ate 11,319 horses and mules.

COLUMBUS, Ohio, has heen five timee fired hy thievee.

THE new peueion bill places Jeff Davie on the penson liet.

REFORM in the tenement bouee eystem in New York, is propoeed.

A TREATY hetween Germany and Samoa was eigned January 24th.

ANOTHER earthquake was felt at Arequipa on the 19th ult. No damage.

YAKOOB KAHN is making friendly overturee to the Viceroy of India.

THE aggregate dehts of the Statee of the Union ie $345,197,000.

THE tax levy in Anaheim, the paet year, was only 60 cents on the $100.

DECISION will eoon he reached on the celehrated "mining dehrie" euit.

THERE hae heen a half-million-dollar run on a New Orleane eavinge hank.

THE Uniou Pacific, Kansas Pacific and Colorado Central have coneclidated.

A GERMAN company are about to establieh a heet sugar factory at Loe Angelee.

CANADA proteste againet a proposed parliamentary duty on American grain.

THE government troops have defeated the revolutioniets at Antioquia in Central America.

HOOS in Yolo county have recently heen afflicted with a dieease reeemhling diphtheria.

ONE HUNDRED AND SEVENTY-EIGHT arrests were made hy the police in Oakland, laet mouth.

MISSISSIPPI farmere are getting uneaey over the prospect of a wholesale departure of negroee for Kansas.

FEMALE etudents are to he admitted to Harvard College, hut subject to a eeparate governing board.

THE Potter committee report that Tilden carried Florida and Louieiana, hut wae counted out hy the Republicane.

THE Stockton *Independent* argues that San Joaquin farmere could not succesefully cultivate so emall a patch as 150 acres.

TWENTY-THREE sailors, on their way from Ferrcl, Spain, to epend the carnival in their native village, were capeized hy a equall and drowned.

SEVERAL tons of ice have heen put up at Mark Weet eprings, Sonoma county, this winter. The first time in the history of the county that it has heen attempted.

THE rehellion againet the Chineee government in Kashgar has heen completely crushed, and remnants of the defeated force are returning to Russian territory.

A CINCINNATI paper eaye a man named Dempsey leavee for California to engage a cargo of Chinese, which he will work as laborers on his air-line railroad contract.

A SPAN 110 feet long of the iron railroad hridge of the Chicago and Altoo road at Wilmiogton, Ill., gave way, precipitating three coal cars into the Kanakee river.

THE San Simeon whale etation gives employment to 21 men. Eleven whales have heen taken thie season, averaging 40 harrels of oil a piece. The oil is worth ahout $12 per harrel.

THE Workingmen will send a lecturer, accompanied by a Chinese leper, to follow on the track of Otis Gihson and his convert to Christianity, that the people of the East may see what Chinese immigration means.

Notices of Recent Patents.

Among the patents recently ohtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

ATTACHMENT FOR BOTTLE FASTENINOS.—S. Martinelli. Dated, Wateonville, Feh. 11th. This attachment is for the fasteninge to hottlee euch as are employed to hold the corke in place when effervereing liquids are confined in the hottlee. Theee fastenings coneist of a curved metal loop eo hinged at the eides of the hottle neck ae to ewing over the cork to retain it in place after tbe hottle is filled, and they are pulled to one side, when it ie desired to remove the cork. It ie often very difficult to remove theee fasteninge, ae they hecome imhedded in the cork hy the internal preesure. Thie invention consiete in the employment of a wire attachment to the link or fastening, so that one is enahled to overcome any etrain and remove the faetening at any time with very little effort.

CHAIR BRACE.—S. P. Sorensen, Rio Vieta. Thie iuvention relates to an improvement in chaire; the improvemente coueiet in providing peculiar hracee to hind the lege, eeate and arms together firmly, eo ae to etrengthen the chairs. A hinding rod is secured to each leg, tbe oppoeite ends of eaid rod meeting in a common plate on a holt in the center of the chair under tbe seat. A thumh ecrew on thie plate holde tbe plate in position and admite of ite being moved up the holt and tightening the rode, thus keeping the lege firmly in poeition. The hrace under the seat on which the holt carrying tbe center plate ie eecured, ie held in place by rode running from the arme of the chair, eo that theee rode are drawn tight hy the eame action of the screw that tightene the rode connecting with the lege. By thie meane the whole chair is firmly bound together.

[From the San Jose *Mercury* of January 17th.]

The Angora Robe and Glove Co.

One of the beet illustrations of what may be done to promote the growth of home industriee ie the work of the Angora Robe and Glove Company. The gentlemeu who eetahliehed this business, and wbo carried it to its present high degree of success, deserve the hearty thanks of every citizen of the Pacific Coast. Everything seemed against them at the start. Even their raw material was little thought of, and the processee of manufacture were almost entirely unknown. But they were not the men to be daunted by difficulties. Experiment after experiment was made, until at length the enterpriee was entirely succeeeful, and the grand results are now before us. Hardly a dwelling with any pretenelons but owes mucb of its elegance to their genius and skill. Tbe carriages that throng our streets, bearing the heauty and the chivalry of the city, are brilliant witb Angora robee and wrappings. The fur coat of the driver, hie well-fitting gloves, and even the whip with which he urgee along his fiery steeds, are manufactured by the Angora Robe and Glove Company.

As ie the case with most things worth baving, tbis enterprise hae been of elow and steady growth. When it was first started none of ite promoters expected to see it reach its present prosperity. They deeired to do wbat they could to establieh a new industry in tbe city, which they hoped might in time become succeseful and permanent; but their success has been mucb greater than they expected. They have now the largeet factory of tbe kind on tho coaet, and their goode are sold in every city on this eide of the Rocky mountains, and even in eome of the Eastern States. They have their own tannery, and have acquired tbe art of turning out more perfect skins than any other company io the world. They employ about 50 hands, more than half of whom are women, and tbeir annual products amount to nearly $50,000, and all has been done in a very few years.

And, beeidee thie, they bave created an unlimited demand for goat skins, and thus helped to diversify our agriculture, wbich is in iteelf a great advantage to tbe State. They buy all tbe skins that are sent to tbem, giving 30c. to 50c. for common skins, and 50c. to $1.50 for good fleece skine. The better tbe animal, and the greater tbe care taken of the skine, tbe higher tbe prices—a fact which all breeders should make a note of. Care should aleo be taken by coneignors to mark their own name carefully on eacb package of skins sent. By eo doing they will save the company much trouble, and possibly themselvee from actual loss.

The present officers of tbe Company are C. P. Bailey, President; Jackeon Lewie, Secretary; J. W. Hinds, Treasurer; and the Directore are all solid men of business. Mr. Bailey ie also one of tbe largeet breeders of thoroughbred and graded Angora goats on the coast, having about 4,000 animals on his farm at Battle Mountain, Nevada; Mr. Lewis is aleo a large owner and breeder of goats, and hoth gentlemen have a thorough acquaintance with the husinese, and will ultimately make it one of the moet valuable industriee of the State.

FRESH attractions are conetantly added to **Woodward's Gardens**, among which ie Prof. Gruher's great educator, the Zoographicon. Each departmcnt increases daily, and tbe Pavilion performauces are more popular than ever. All new novelties find a place at this wonderful reeort. Prices remain as usual.

EXAMINE the accelerative endowment plan, as origioated hy the Mutual Benefit Life Ineurance Co., of Newark, New Jersey. Assete, $30,533,429.94. Lewis C. Grover, President; L. Spencer Cohle, Vice-Preeident; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of ineured, 224 Sansome St., San Francieco.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinde of electrical and telegraphic apparatus to order. See ad. F. W. FOLLEN, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., March 5, 1879.

BAGS—Jobbing.

Eag Standard Wheat	9 @ 9¼
Neville & Co. Hand Sewed, 22x36	9 @ 9¼
24x36	—@—
32x60	11 @—
Machine Swd, 22x36	9 @ 9¼
Flour Sacks, halves	8½@10
Quarters	5½@ 6½
Eighths	3½@ 4
Hessian, 50 inch	13 @14
45 inch	8 @ 9
40 inch	7½@ 8
Wool Sacks, Hand Sewed, 3½ lb	46 @50
4 lb do	50 @52½
Machine Sewed	45 @—
Standard Gunnies	13½@14
Bean Bags	7 @ 7½

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2½ lb cans	2 00 @ —
Table do	3 00 @ —
Jams and Jellies	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef, 2 lb doz	4 00 @ —
do Beef, 4 lb doz	6 50 @ —
Preserved Mutton, 2 lb doz	4 50 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb doz	6 50 @ —
Deviled Ham, 1 lb doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —

COAL—Jobbing.

Australian, ton	8 00 @— —
Coos Bay	6 50 @ 7 00
Bellingham Bay	8 50 @— —
Seattle	6 00 @ 6 50
Cumberland	4 00 @— —
Mt Diablo	4 75 @ 6 00
Lehigh	3 50 @— —
Liverpool	7 50 @ 8 00
West Hartley	10 50 @— —
Scotch	10 50 @— —
Scranton	7 50 @— —
Vancouver Id	7 00 @— —
Charcoal, sack	75 @— —
Coke, bbl	60 @— —

COFFEE.

Sandwich Id, lb	@— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manilla	17 @— —
Oround, in cs	25 @— —

FISH.

Sac'to Dry Cod	4½@ 5½
do in cases	5 @ 5
Eastern Cod	—@— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No 1 Mess, Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd Hlg	70 @— —

LIME, Etc.

Lime, Sta Cruz, bbl	1 25 @ 1 50
Oement, Rosendale	2 00 @ 2 25
Portland	4 00 @— —

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn 10 00	@12 50

NAILS.

Assted sizes, keg 2	90 @ 3 00

OILS.

Pacific Olive Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @ —
do, No 2	1 05 @ —
Baker's A A	1 25 @1 30
Olive, Flagniof	5 25 @5 75
Poseet	4 75 @5 25
Palm, lb	9 @— —
Linseed, Raw, bbl	72 @— —
Boiled	75 @— —
Cocoanut	55 @— —
China nut, cs	70 @— 72½
Sperm	1 40 @— —
Coast Whales	40 @— —
Polar	45 @— —
Lard	90 @1 00
Oleophine	22 @— 22½
Devoe's Brill't	22 @— 23½
Photolite	—@— —
Nonpariel	31 @— 32½
Eureka	18 @— 42½
Barrel kerosene	20 @— —
Downer Ker	37½@— —
Elaine	37½@— —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@— —
Putty	4 @ 5
Chalk	1½@— —
Paris White	2½@— —
Ochre	3½@— —
Venetian Red	3½@— —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	5 @ 5½
Hawaiian	7 @ 7½

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	10 @ 10½
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 15
Mustard, Cal. ½ lb glass	1 50 @ —

SUGAR, ETC.

Cal. Cube, lb	11½@— —
Powdered	11½@— —
Fine crushed	11½@— —
Granulated	11 @— —
Golden C	9½@— —
Cal. Syrup, kgs	70 @— —
Hawaiian Molasses	26 @ 30

TEA.

Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 50
Hyson	30 @ 35
Fooo-Chow O	35 @— —
Japan, 1st quality	40 @— —
2d quality	20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., March 5, 1878.

IRON.— American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7½
Norway, according to thickness	6½@ 7
COPPER.— Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 29
Sheathing, Old Yellow	— @—
STEEL.— English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	15 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.— 10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.— By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.— Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, March 5, 3 P. M.

SILVER, 2½@2. GOLD in New York, par.

GOLD BARS, 890@910. SILVER BARS, 8@20 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾, Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 87½@88.

LONDON CONSOLS, 96 5-16; Bonds, 103.

QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending March 4, 1879.

HIGHEST AND LOWEST BAROMETER.

Feb 26	Feb 27	Feb 28	Mar 1	Mar 2	Mar 3	Mar 4
30.158	30.055	30.071	30.017	30.258	30.314	30.186
30.064	30.005	30.020	29.991	30.037	30.238	30.051

MAXIMUM AND MINIMUM THERMOMETER.

70	61	61	61.5	57	59.5	58
50	53	48.5	49.3	43.7	46.7	53

MEAN DAILY HUMIDITY.

77	87.7	64.7	61	63.3	70	81.3

PREVAILING WIND.

NW	W	W	S	SW	S	S

WIND—MILES TRAVELED.

100	105	203	138	247	214	243

STATE OF WEATHER.

Fair.	Clear.	Clear.	Fair.	Fair.	Fair.	Rainy

RAINFALL IN TWENTY-FOUR HOURS.

			.13			1.57

Total rain during the season, from July 1, 1878, 13.10 in.

WATSONVILLE, July 29th, 1878,

MESSRS. DEWEY & CO.—*Gents:*—I was not expecting my patent so soon. You certainly kept your word when you said no time would be lost. I remain, youretruly,

W. T. EASTERDAY.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Griffith Consolidated Mill and Mining

Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. f) levied on the 21st day of January, 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
J H Brewer	36	50	$ 10 00
Warren Bryant	not issued	2f00	420 00
Alexander Bryant	37	1125	225 00
Alexander Bryant	38	1125	225 00
L H Foote	39	100	20 00
L G Harvey, Trustee	35	4000	800 00
J H Roberts	19	500	100 00
J H Roberts	20	500	100 00
J H Roberts	21	500	100 00
J H Roberts	22	500	100 00
J H Roberts	26	500	f00 00
J H Roberts	27	500	100 00
J H Roberts	28	500	100 00
J H Roberts	29	500	100 00
J H Roberts	30	500	100 00
J H Roberts	31	500	100 00
J H Roberts	32	500	100 00
J H Roberts	33	500	100 00
J H Roberts	34	500	100 00
J H Roberts	280	200	40 00
J H Roberts	281	200	40 00
J H Roberts	282	200	40 00
J H Roberts	283	200	40 00
J H Roberts	284	200	40 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, No. 330 Pine street, Room 48, San Francisco, California, on the 26th day of March, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessement thereon, together with costs of advertising and expenses of sale.

G. M. CONDEE, Secretary.

Office, Room 48, No. 330 Pine St., San Francisco, Cal.

Office Wide Awake Prospecting and Mining

Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Pickot-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors.

C. HILDEBRANDT, Secretary.

POSTPONEMENT.—The delinquent day of the above named assessment has been postponed until Tuesday, the First day of April, 1879, and the day of sale until Thursday, the First day of May, 1879, at the same hour and place. By order of the Board of Directors.

C. HILDEBRANDT, Secretary.

San Francisco, March 1st, 1879.

Summit Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the fourth day of February, A. D. 1879, an assessment (No. 7) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, San Francisco.

Any stock upon which this assessment shall remain unpaid on the eleventh (11th) day of March, A. D., 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the Tuesday, the eighth day of April, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine Street San Francisco, Cal.

The California and Oregon Land Company.

—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the First day of March, A. D., 1879, an assessment (No. 2) of Forty Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 5, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of April, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Saturday, the Tenth day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco, California.

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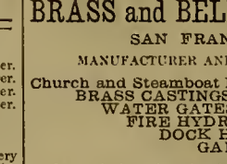

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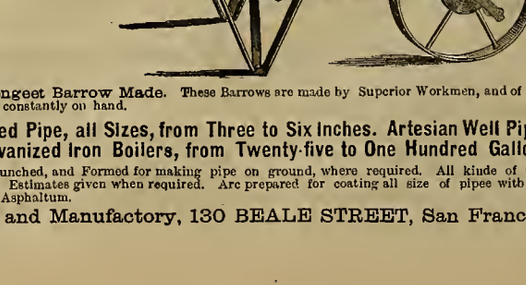

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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AURORA, Nev., Dec. 7th, 1878.

MESSRS. DEWEY & Co., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

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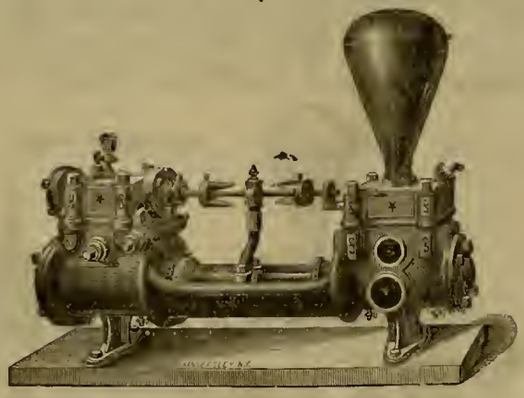

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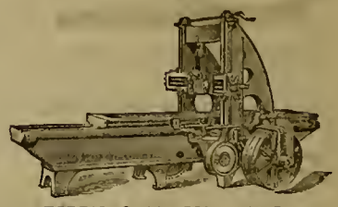

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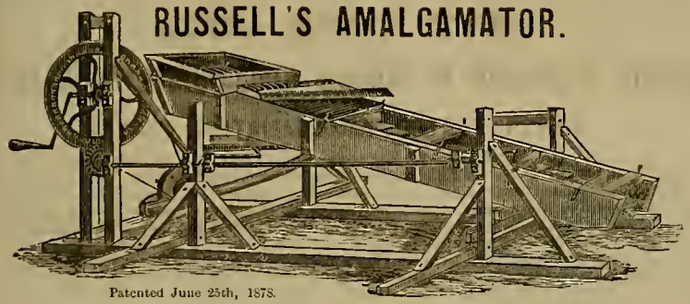

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The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

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Walla Walla, Dec. 24th.

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THE SAFETY POWDER COMPANY,

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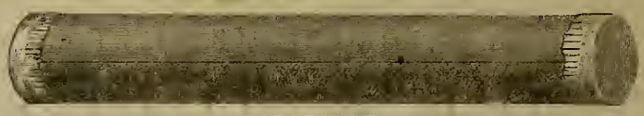

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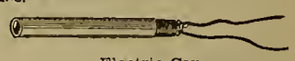
GEN. W. S. ROSECRANS, President.

Fuse Lighter and Fuse.

COL. SAM'L O. GREGORY, Secretary.

Safety Cap and Fuse.



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Safety Powder, Caps, Electric Caps, and Fuse Lighters.

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Cold does not affect them. They cause no headaches or other inconveniences in handling, and the smoke from their explosion contains no poisoning or sickening vapors.

Their blasting force, with slight tamping, at least equals that of any Powders now used, but they admit and require strong tamping to bring out their immense and peculiar lifting power which follows their detonating work. They should be fired, therefore, by our

Safety Cap,

Which allows tamping without danger. They can be fired by any caps now employed in blasting, but the use of these is always dangerous with any Powder, and the loss of the throwing power resulting from lack of tamping renders it with our Powders doubly objectionable.

Our SAFETY CAPS have twice or thrice the force of triple Giant Caps. When set on fire they do not explode, but merely burn off, and are perfectly safe in transporting and in tamping.

In round tin boxes, 50 cents.

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Cheap, handy and sure to light the Fuse upon the end of which it is fastened, only needs a trial to be appreciated by every miner who is up to "snuffs." 25 Cents per box; sent by mail.

Safety Fuse,

Equal to the best in the market, will be supplied at the lowest market prices.

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SILVER PLATED COPPER AMALGAMATING PLATES.

The BEST PROCESS yet discovered for SAVING FINE GOLD. Extensively used in Mines and Quartz Mills. Over FIVE HUNDRED ORDERS have been filled for these Plates.

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THAN ANY OTHER ROCK DRILL.

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HOISTING ENGINES,

ALL SIZES, DOUBLE AND SINGLE, WITH SINGLE and DOUBLE REELS.

Pressure Blowers. Diamond Anti-Friction Metal. Flexible Shafts.

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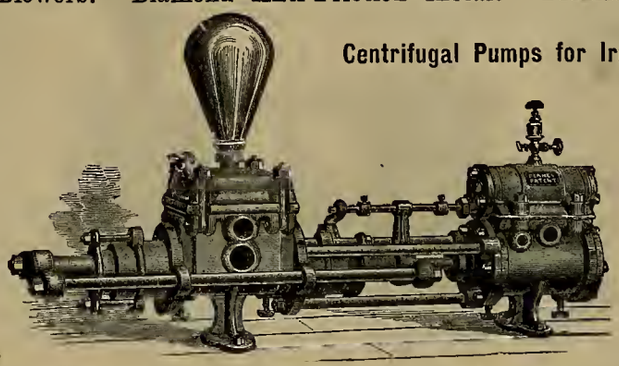

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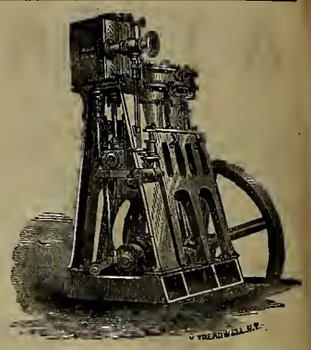
VERTICAL AND HORIZONTAL.



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Givee Better Reeults than any Compressor Known.

Putnam's Wood-Working Machinery.

MACHINISTS' TOOLS.

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HILL'S EXPLODERS.

SEND FOR CIRCULARS.

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PIPE & TUBES,

Seamless Lap-Welded,

For Steam, Gas, Water and Oil Wells.

All Sizes, from One-Fourth to 15 Inches Diameter.

—ALSO—

LAP-WELDED

PUMP COLUMN,

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Air & Hydraulic Pipe,

From Three to Fifteen Inches in Diameter.

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GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS
Nos. ONE, TWO and THREE.
Stronger, Better and Safer than any other High Explosive.

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

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SILVER PLATED AMALGAMATING PLATES.

The best process yet discovered for saving fine or float gold. Extensively used with great success in gravel and placer mining in various parts of the Pacific Coast. Over five hundred orders have been filled, and the demand is constantly increasing. A large number of these Plates were sent to Snake River mines, Idaho, last year, and a great many orders are being filled for them this season. Circulars containing full instructions for working these Plates sent with each order. Old Mining Plates bought or taken in exchange for new Silver Plated Plates, and full value allowed. Gold extracted from old Plates at a moderate cost by a new and economical process. Old Plates (which often contain a surplus of gold above the cost of plating) can be re-plated.

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Mining Men and the public generally are cautioned against unprincipled and irresponsible parties traveling through the country, endeavoring to secure orders for very inferior qualities of Silver Plated Mining Platee.

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These Steam Governors have long been known as THE BEST, and as lately Improved and Perfected, they have no Rival.

THE SAFETY STOP

On these Governors is alone worth double the price of the Governor. We have sold over six hundred, and

Never one has Failed.

They ars sold at the same price (or less) as ordinary Governors. Send for Circular.

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To Mining Men!

All who are interested in improved Mining Machinery, are requested to examine one of the largest size of

PAUL'S PULVERIZING BARREL,

Which can be seen (prior to shipment), at the Golden State and Miners' Foundry, 237 First Street, near Howard.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, MARCH 15, 1879. VOLUME XXXVIII Number 11.

Boiler Explosions.—No. 2.

(Written for the PRESS by H. W. RICE.)

When steam engines were first introduced io Califoroia for furoishing motive power for threshing machines, it was thought by many that they could never be euccessfully used on account of danger from fire. The idea of having firo in a harvest field, where dry straw was scattered loosely about, or piled so oear that the smallest sparks could alight upoo it. Beeidcs, the sun poured down its heat almost intense eoough to make sufficient steam for the threshing work, and, undoubtedly, would do so if there was sufficicot moisture, and a way to receive and confine it. The danger from fire was all that was thought of as an obstacle to the success of stoam threshing engines. Danger from explosions was never discuesed or evon meotioned. No engiue was seut out witbout a competeot eogioeer to run it, and for a considerable time no explosioos took place. Engines at that time were not as large and powerful as at tbe prcsent day, and it was necessary to work them to their fullest capacity to do the work required; yet the work was performed, and no eugines exploded.

About four years after the first introduction of steam in our barvest fields an explosion occurred in Contra Costa county, near Pachoco. Probably there is oot a case on record wbere the destructive force of coufiued steam pressure was so dreadfully illustrated as it was ou that occacion. On the next day after the explosion we visited the place, for the sole object, if possible, of learning thc cause, and for sucb instruction as might be gained or obtained from a survey of the terrible wreck which was spread io such confusion over that large wheat field. At the time of our visit there was not a person preseot, aod a good opportunity preseoted itself to look carefully at what was to be seen, without hearing a word to excite or prejudice. Where the engine stood nothing was left but the ash-pan, which was flattened and bedded into the earth. The boiler was strong, and all parts being of nearly equal strength, no particular spot gave way, but it was literally torn into fragments. The largest piece was a boiler head holding the tubes—32 iu number—four feet eight inches long, aud two inches in diamter. This piece was thrown about 50 feet, and struck the eeparators, where the feeders usually stand. The steam dome, weigbing about 200 pounds, was lifted in the air and thrown ovcr the separator, and dropped about 400 feet from wbere it started. The truck wheels were tbrown in four different directions, and one of them we were not able to find. A span of horsee were standing near tbe separator, attached to a wagon loaded with bound wheat bundles. The horses were fully 40 feet from tbe engine. One of these horses was lifted into tbe air, carried over the load, and dropped about 15 feet behiud the wagon. Tbe wagon pole was broken and carried on top of the load, and parts of the harness were left on tbe way whicb marked the direction that was taken by the horse. We learned afterwards that a man was reclining under the wagon and a dog by his side was killed, while the man escaped uninjured. The engineer was thrown ahout 100 feet and, of course, was instautly killed. Tbe owner of the machine was struck by a piece of iron and crippled for life.

We afterwards heard a great many conflicting reports from different persons. It was said that tlie engineer made the remark in the morniug that he would "make steam with her or blow ber to —." The place he mentioned probably bas not a fit climate for our present style of machinery. This statement was contradicted, but having often heard the same or like expresieions, it offers a good opportunity to express disgust at recklessness or carelessness in any form, more especially when it endaogers the lives of ionocent persons who are obliged to work around these machines, besides beiug a very foolish piece of profanity.

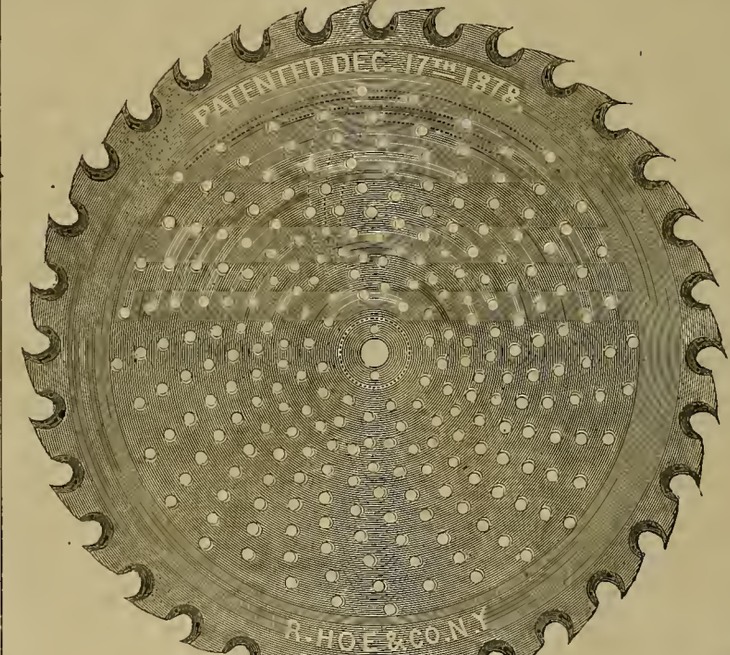
The most reliable information shows that the engineer was one who kept his engine carefully oiled and cleaned. The safety-valve was neatly ground to a perfect fit, no steam being allowed to blow off, and no part of tho boiler or engioe was allowed to lack tho least amount of water or eteam. It had been staoding for fully an hour with a fire of wood aod live coals, aod tbe steam gauge iodicated a pressure of 140 pouods. There was no water glass, but three compressioo gauge cocks were used to determine the amouot of water in the boiler. The engineer opened the throttle valve and directed a man to take bold of the fly-wbeel and start it off the ceoter. At the instaot it took eteam it exploded. Here is excellent opportunity to explaio the cause of ao explosion by either of two tbeories, as there were persons staodiog by who declare that the water was low, and others as pereistently maintaio that there wae fully two gauges. If the water was low aod the crowo sheet and top tubes were overbeated, it is easy to see that when the eogine valve moved and a cylinder full of steam was drawn out, tbe water would rise over the hot iron, and the explosion would be caused by the "spheroidal state of the water," a popular theory, which is fully described in old and reliable publicatioos which are in the reach of any person who wishes to become familiar with them. They should be carefully read by every engineer or eugine owner.

If there was plenty of water in the boiler, which was the more probable conclusiou, then the explosion was from another cause, whicb the nature of this case would indicate to be true. If a boiler which is perfectly tight has steam raised to a high pressure, and the fire is sufficient to keep up the pressure, no steam being allowed to blow off, and no water being allowed to be forced into it, it is supposed tbat the globules of water in the boiler come in contact with the heated surfaces, and, becoming heated, they move away, giving place to cooler ones. This slow circulation causes all the water in the boiler to be heated higher than would be required to make it into steam. If the boiler is left perfectly quiet, and allowed to cool off, no harm would come of it, but if the water becomes agitated, as by a shock or jar, to give it a quick motion, the globulee flash into steam instantly, and uo greater destruction could take place if it were filled with giant powder.

It is claimed that this can be effectually obviated by allowing the safety-valvc to blow gently, or by pumping in a little water quite ofteo. Io somo sawmills there is considerable timo that the engine is obliged to stand still while the saws aro being put io order, and it is positively ordered by owners that the safety-valve be always allowed to blow off while tbis is beiog done. If engineers of threshing engioes would make this a rule, undoubtedly a great many of the boilers would be saved which are now blowo up.

An Improvement in Circular Saws.

Our lumbermen aod wood-workers will be interested io the improvement in circular saws shown in the engraving on this page. The improvemeot is a simple one, and yet those wbo have tried it assure us that its working is most gratifying and effective. It is styled the ventilated or perforated saw, and is one of the many useful inventions of R. H. Hoe & Co. Its style of manufacture has an influence both upon the quality of the saw itself and upon its working, as may be learned from the following review of



THE VENTILATING OR PERFORATED CIRCULAR SAW.

the results obtained by perforating the blade in the manner shown in the engraving :

The manufacturers of circular saws tell us that all large circular saw plates warp badly in the process of hardening, varying from one to four or five inches from true. The tendency is to dish, because the periphery of the plate cools fastest, and has the same result as shrinking a tire on a wagon wheel. To obviate this difficulty the body of tbe plate is thickly perforated with circular boles. These allow of the contact of the cold oil and the escape of the gas generated by it and the hot steel, as freely throughout tbe body of the plate as at the peripbery. The whole plate will therefore shrink equally, and remain straight through the entire process of mauufacture. Platee frequently break while hardening, and many are broken while being drawn under the hammer, to counteract the buckle produced by hardening. A good working saw cannot be made from a plate that has been badly cast in hardening. Tbe unequal strain of the metal caused by hammering for the purpose of trueing a badly warped plate, is the principle cause of a saw's breaking while in use, or making a cut. The small circular holes, instead of weakening the plate (as unprofessionals would suppose), add materially to its stre ngth, and lessens its liability to break while working.

In the workiog of the saw it ie found that all the chip that escapes from the throats of the teeth and is driveu between the saw and timber, will fall into the holes and he carried out of the cut, thos relieving the plate from all friction and cooscquent heating. Furthermore, each beveled bole will act as a fan, causing a rapid curreot of air to flow through the body of the saw—air io motion abeorbs heat rapidly—and will tbus prevent the saw from beating. This method of ventilatiog large circulars is applicable to solid as well as chisel bit saws, and we shall be able to ruo mucb thinner saws than tbose oot so perforated.

It will be remembered that tbe chisel tootb circular saws are also the iovention of R. H. Hoe & Co. They have giveo wide satisfaction according to all accounts that we have seen. Tbese were introduced oo this coast by Tatum & Bowen, No. 3 Fremont street, S. F., aud the same firm is now introducing the perforated saw whicb we bave described. Tbe perforated saw has been used in the Puget Sound lumber district and the report is that its operatiou is moet satiefactory.

The Isthmus Canal Project.

Tbe old problem of a canal cutting tbe Isthmus of Darien is now assuming new life tbrough the persistent inquiry of tbe French. On another page in tbis issuc, will be found a brief summary of the results attained by the last body of French engineers sent out to study the feasibility of the eanal. Their report is being followed up by French writers wbo take up tbe resultant benefits of the canal and adorn them witb rosy colors. The latest of these views is that of the *Economiste Francaise*. This journal has been figuring the cailing time between different commercial centers, whicb court the Chinese trade, and the computations are fonnd to be vastly in favor of our Eastern seaboard over England. Our Eastern merchants and manufacturers are pushiug their Eoglish competitors close to the wall in many ports of the world, and they will make haste to avail themselves of any advantages whicb tbey may find in assailing the eastern coast of Asia with their merchandise.

Tbc French journal, to which we have alluded, gives statistics showing the actual differences in distances and time betwcen voyages from tbe English channel to Pacific and Chinese ports, and from New York to the same poiots. Tbe advantages are in favor of the latter, being to San Francisco, Callao, Valparaiso and Sandwicb Islands, four and a balf days, or from 3½% to 4⅜%, and 8½ days, or 7%, to Shanghai. If an isthmus canal be opened, tbe difference for sailing veseels would be 24 days, or from 33% to 51% from New York to the four places named, and 22½ days, or 28% to Shanghai. The average gain to New York vessels would be 2,000 miles, or 19 days over English and French competitors. Attention is then called to the iocreased use of steamers since the opening of the Suez canal. The same result would follow by the isthmus route. The difference then in favor of New York for steamers, which is now very emall, amounting to only one day, or from 1½% to 3%, would, with tbe canal, be, to San Francisco, 12 out of 29 days, 41%; Callao, 12 out of 21, or 57%; Valparaiso, 12 out of 27, or 44%; to the Sandwich Islands, 12 out of 35, or 34%—an advantage of 44% on the average for New York, simply doubling the commercial advantages to the United States with the Pacific.

It will he greatly to the glory of the Freuch engineers and capitalists if they succeed at Darien, wbere so many commercial powers, including our own government, have explored and turned back in dismay. Although, we should dislike, on general principles, to see any foreign nation win control of any artery of commerce which will he so important to tbis country as the isthmus caual, still if the project goes much longer by default by our inactivity, their cau be no cause for complaint. Perhaps it would be as well to have the French own the canal as auy other foreign power, and so long as we get the commercial benefit, perhaps we can afford to let the French raise tbe money and reap tbe glory.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Ens.

Douglas District, Wyoming.

EDITORS PRESS:—Douglas creek, in Douglas district, Carbon county, Wyoming Territory, is a beautiful stream running through the Medicine Bow mountain range. The Medicine Bow mountain forms a broad, elevated range, with a gradual easterly descent toward the Laramie plains. There is a narrow but beautiful and picturesque valley along the course of Douglas creek. This valley is very winding, and is over-topped by high peaks on either side. The average altitude is about 9,000 feet above the sea; the crest of the peaks about 10,000 feet, and the most elevated point probably 11,000 feet.

Kind of Rock.

The mass of the Medicine Bow range is gray gneiss and granite. The greater portion of the latter is red granite, its feldspar being red orthoclase. These metamorphic rocks have been penetrated by large masses of igneous rocks; and the great upheaval, displacement and scattering of the metamorphic rocks shows the igneous action to have been most intense. The action has been general throughout the range, though in some places we can still see evidence of stratification, but these localities are few. Any fossil forms must necessarily have been destroyed by the intense and wide-spread igneous action, rendering it impossible to give the age of the rock mass of which the range is composed.

At considerable depths below the surface the greater portion of the rock is greenstone (massive rock serpentine). This is shown by the development of the mines now being worked here, the Keystone and Florence; the wall rock of both these mines being composed of greenstone, occasionally passing into talc-schist.

Conclusions from Geological Formation.

Assuming that the now universally accepted theory of the formation and filling of fissures is correct (*i. e.*, the formation of fissures by earthquakes, caused by volcanic action, and the filling by chemical solution and infiltration from the interior, the solution being aided by steam and heated gases), we are led to believe that a great many fissures must have been formed in this range. And that a large amount of steam and heated gases must have resulted from the intense volcanic action, which would exist in the crevices long after the eruptive action had ceased, thus aiding in the solution of the metals and filling of the fissures.

The next inquiry will naturally be: "What metals are the material filling these fissures likely to contain?" Of the number and quantity of each it would be impossible to form an estimate, as many of the metals are found in veins which traverse all formation. I shall, therefore, confine myself to the probability of finding a single number of the group, viz., gold.

It does not require a very wise man to predict, and even prove, the existence of gold in this belt, as it has already been found in sufficient quantity to pay for its extraction in both the Keystone and Florence mines. Hence I will consider the probability of its being found in the veins and in considerable quantity. In this connection we must consider the influence of the country rock on the contents of lodes. While no general laws can be laid down under this head that will be applicable to all localities, yet experience has well established the fact, that for every mineral-bearing locality where the country rock is dissimilar a classification of such rock is admissible into what is called ore-carrier and non-carrier; this is especially true of gold-bearing districts, and in one district in the Hartz mountains a gold-bearing quartz vein is found running through gray and red gneiss. Now, this vein pays well during its continuance in the gray gneiss, but is almost barren in the red.

From personal experience I can state, that the country rock of all rich gold-bearing ledges that I ever saw (notably those of the South American mining company and Callao mining company in Guayana, Venezuela) was gray gneiss, the wall rock at considerable depths being greenstone in both instances. I am aware that good and paying gold-bearing veins have been found in a purely granite formation, but gray gneiss is regarded, and correctly so, as a far more favorable gold-bearing formation. I will here state that gneiss is a granite rock, but should not be confounded with a true granite. The chief distinction between them is that in gneiss the mica is aggregated into layers, giving to the rock lines of cleavage; while in the true granite the mica is irregularly disseminated through the mass and possesses therefore no lines of fracture.

One of the veins before alluded to, viz., that of the Callao mining company, has a maximum width of nine feet, pinching out in places to three feet, the average being about six feet. Now, this district (Douglas creek) has been subjected to more intense igneous action than that of Callao. The country rock is essentially the same in both districts. It is not unreasonable, therefore, to predict the existence of as large, or even larger, gold-bearing veins in the former as in the latter.

A Good Field for Prospectors.

But little prospecting has been done in this range, yet I know of no better field, and for two reasons: 1. On account of the good natural facilities the district offers for treating all classes of ore. 2. The excellent wagon road between Laramie City, a pleasant city situated on the Union Pacific railroad, and the range.

The entire range is covered with a thick growth of pine; the trees have an average diameter of about one foot. This timber makes an excellent fuel, and is also good mining timber; the only expense to be incurred would be that of cutting and delivering.

Douglas creek furnishes an abundant supply of water for all purposes, both winter and summer. So that the question of a sufficient supply of fuel and water for metallurgical purposes is here very nicely solved.

A tri-weekly stage coach runs between Laramie City and the town of Douglas. The latter is a mining town of about 200 inhabitants, situated in the range, and about 12 miles from its eastern slope. The road is through the Laramie plains for a distance of 33 miles; then ascending the eastern slope of the range it leads through the most level portion of the same for a distance of 12 miles, when Douglas is reached. Grading has been done where it was found necessary, so that good facilities are offered for travel and the transportation of heavy machinery between the range and the Union Pacific railroad. J. G. MURPHY, E. M.

The Industries of Inyo County.

EDITORS PRESS:—This region should, geographically, belong to Nevada, lying, as it does, east of the Sierra Nevada mountains. Our supplies from San Francisco are shipped either via. Carson or the southern route, via. Mohave. By either route, freight is about five cents per pound, and thousands of tons are shipped yearly to these mining districts and farming settlements. From Borden, Fresno county, the distance nearly due east, across the Sierras, according to survey made last summer by Mr. Sherwin, is 90 miles to Lake district, a new mining district formed last year. There is a good wagon road from Borden, or Madeira, to the saw mills at Fresno Flats, distance, 50 miles; the other 40 miles, there is only a dim, rough trail. It is estimated that $50,000 would build a wagon road through to Lake district. This district (altitude about 9,000 feet above sea level) is on the eastern slope of the Sierra Nevada range. Running parallel with the Sierra is another grand range called the Inyo, or White mountains, where peaks of 12,000 feet and upwards may be seen. Lying between these two romantic ranges is Owens valley, which is over 100 miles long from Lake district to Owens lake. Owens river heads in the vicinity of Lake district, and empties into Owens lake, while the San Joaquin heads a short distance from the other, but meanders to the western slope of the Sierras.

Mines and Farms.

Mono lake, the "Dead sea of the West," is only a few miles from Lake district, and the celebrated Bodie mines are still north of Mono. Imagine, now, that you are looking south from this elevated region and you will take in wild, romantic sceneries, especially along the Sierras from Mono to Owens lake. But, unless there is "money in it," what do we care for the grand and sublime in nature! Well, then let us scamper south along the Inyo range and detached hills, and we will strike some rich mining districts. There are Blind Springs (Benton), Indian district, Montgomery, Indian Queen, Bellville, Columbus, Silver Peak, Golden Wedges, Johnson mines, Lida Valley, Eclipse, Darwin, Cerro Gordo, Coso mines, etc. Strike again across the valley and run north along the eastern slope of the Sierra range, and you will run into Alahama, Kearsarge, Silver Sprout, Fish Springs mines, Bishop Creek mines, French district, Minnietta, Laurel, Lake Prescott, Dunherhurgh, etc. Judging from present indications we are "almost persuaded" that the mineral resources of this big country is inexhaustible, and that within a short time the population will increase a hundredfold, when streams of hullion will be continuously rushing to your city.

We will start again at Lake district, which overlooks a large valley called

Long Valley,

About 15 miles long and several miles wide. On account of its altitude, about 7,000 feet above sea level, it is not a grain-producing valley, but an excellent summer range for stock, grass and water being abundant. Thousands of horses, cattle, sheep and hogs are driven early every summer into this valley from the various settlements south, and late in the fall are driven back again by their owners. Owens river runs through Long valley. About 100 miles south of this valley is

Round Valley,

Which is six miles long and three miles wide. This is a fine valley, under a high state of cultivation. Wheat, oats, barley, corn, potatoes, and all kinds of vegetables grow well here. Although the altitude is between 4,000 and 5,000 feet above sea level, good crops have been raised every year (no failure yet) since 1865, which was the first year of farming in this locality. This valley lies at the base of the Sierras, and is well watered by three large creeks, which are sufficient for irrigating purposes. Two or three miles farther is

Pleasant Valley,

Where several farms are yielding good crops. Still southeast four or five miles is the thriving settlement of Bishop Creek. Four stores, two schoolhouses, church, two or three hotels, a number of saloons, two flouring mills, one brewery and malt house, shoemakers, blacksmith shops, etc., flourish here.

About six miles south of Bishop Creek is the "Watson place," where grain and alfalfa do well and considerable fruit is raised. A vineyard of 15 acres, producing excellent grapes, may be seen here.

Still south seven miles is the Big Pine settlement, where large crops of the cereals, alfalfa, etc., are raised.

On a "bench," nestled at the base of the Sierras and almost encircled by hills, is a fertile little valley of a few hundred acres, where fruit in great profusion is grown by Bell and Baker.

Fish Springs, seven miles from Big Pine, is another farming settlement, and from there to Independence there is more or less farming done.

Independence

Is the county seat of Inyo, where a weekly paper (*Inyo Independent*) is published, which has for seven or eight years disseminated valuable information respecting this region. Camp Independence (the "Fort," two miles north of town,) is in latitude 36° 50′, altitude 4,598 feet above sea level.

From Independence, south, to Lone Pine (16 miles) there is also considerable farming. Lone Pine is quite a town, where the southern mining camps of this county get their supplies. A few miles south of Lone Pine is Owens lake. From the lake, in fact from Lone Pine, the country is a desert waste to Mohave, the nearest railroad point, over which the Cerro Gordo Freighting Company navigate their "prairie schooners."

All the foregoing settlements lie west of the river (Owens) and the thousands of acres under cultivation are entirely irrigated by the large, purling streams issuing from the canyons of the Sierras. Very few streams flow from the White mountains, hence the comparative scarcity of the arable land along their base. However, considerable desert land is being reclaimed east of the river, water for irrigating purposes is taken out of that large stream. Several miles of ditches have already been dug by Col. Alexander, Owens, Collins and others who raised a crop last year. It is stated that the land is very productive, providing an abundance of water is applied.

More anon, respecting our climate, soil, its products, etc. T. E. J.

Owens Valley, Inyo Co., Cal.

Atomic Silver — Electrical Metallurgy.

EDITORS PRESS:—The following extracts are from one of many letters I receive on the amalgamation of metals, and as this subject is of universal interest I answer it through the PRESS:

Almarin B. Paul—DEAR SIR: I received with much interest your article entitled "Rebellious Miners," published in SCIENTIFIC PRESS for November.

1. If the atomic doctrine be true of gold, is it not equally true of silver?

2. Does not our silver ores as a general thing contain a goodly percentage of metallic silver?

3. It occurred to me while reading your article that our scientific men ought to experiment more largely with electricity in reducing and saving the precious metals. Our best writers on chemistry now admit that all chemical action depends on electrical action; in other words, that electricity is the intelligent agent.

4 What are the results of your experiments in this direction? Electricity is the coming power and should be carefully looked after by mining men.—A. W., Vestal, Montana.

Upon these points I comment as follows:

1. We cannot apply the same rule to silver as to gold, though both are precious metals; and for the reason that while gold is a simple, silver, to a great extent, is a compound, in other words, not universally in a metallic condition. The great value in the Comstock ores (outside of gold) is in metallic silver, and there is no reason why much of it is not in an atomic condition, though I do not think as universally so as gold. Although I worked Comstock ores for over six years, I never investigated the atomic question, as relates to silver, as I have since, with gold; and for good reasons it takes a vast number of atoms of silver to make a dollar, while a dollar is easily lost or saved if gold; and besides, the percentage gained in working silver, is so vastly ahead of that gained by the barbarous way of working our gold ores.

2. By experiments, I have satisfied myself that there is, in all ores, a much larger percentage of metallic silver than is usually credited to be, and besides there is a great deal of ore considered "rebellious" silver ore that can be worked in consequence of its large per cent. of metallic silver, to a much greater profit without fire than with it; this I apply more particularly to lower grade silver ore. There is too general an opinion that because an ore may carry a large per cent. of silver, that the only successful way to treat it, is to chloridize. I admit a better per cent. may be obtained, but will not admit that in all ores it is always the best way or the most profitable. In this age, we work more for profit than per cent., glory or science. One reason there is such a general resort to the roasting of silver ore is, some carry the "baser" metals, as lead, zinc, antimony or copper, and as all must be worked "like they work the Comstock," where the ores are entirely dissimilar, the result is they produce very base bullion, besides vitiating the mercury, and making, in consequence, a heavy loss of mercury and silver. To avoid this "fouling" and baseness of bullion, they say the ores must be roasted. Thus far, they are right, but by a change of operation, and not "work like the Comstock," all the expense of roasting might be avoided, and as good result, with merchantable bullion obtained. If our millmen do not know how to accomplish this, I do, and others as well as myself.

3. Now as to the electrical feature as applied to amalgamating the precious metals. I have expended 10 years on this very question, and have accomplished much, and with one exception—a treatment for the separating cheaply, of the precious metals from base bullion. I have concentrated the good points of these experiments all into my "Dry Amalgamating Barrel Process." You will see in my last pamphlet, page 9, that I say—

Although I have well considered the science of its metallurgical features, its introduction here is of minor importance. This is a practical age; man's aim is wealth rather than science. I therefore present it in a practical shape, and for the present will only attempt to prove my statement by *bars of bullion;* but here I must say, that the process, in a scientific sense, is in perfect accord with the effectual laws of chemical and *electrical science*, all of which, in due time, will be as much appreciated by the scientific, as by the practical miner, who only scans his bullion as a test of merit.

Again, on page 5 I say—

I adopt, therefore, dry reduction, and add to it dry amalgamation, *under heat of electrical action, which in all nature is life*, thus producing amalgamation by *attraction* as well as compulsion.

I first called this system the "electric process," as the amalgamation is based on electrical science, but subsequently dropped the electric part, for the reason I found it was making pecuniary headway backward, this talking about electrical metallurgy, as too many mining men get frightened when they are asked to touch anything with some new scientific idea in it, just as if the art of handling precious metals was to stand still while the world was advancing in everything else.

At the same time I dropped the talk I did not drop the merits or give any further explanation, and now could convey considerable more on electrical metallurgy than I propose to do. What is the use of parading any new scientific fact for solid-headed miners? They want the bullion—not science. The more one seeks to give scientific solutions for practical results the less value is given to any new process or discovery, no matter what it is. I might also add, what is the use of expending time and money on experiments? There is no reward for it. In fact one actually injures his reputation as a sensible business man by advancing new principles, no matter how great the merit.

4. As to the progress and results I have made by my radical treatment of ores, I will answer thus:

1st. I have determined that what has been deemed a myth of alchemistical science to be a *practical* fact—viz, that there is such a thing as "philosophical mercury" (as the alchemist called it). In practical wording, that mercury can be placed in such a condition as to have affinity only for gold and silver. In other words, that I can work ores containing gold, silver, lead, antimony, zinc, copper or arsenic, as a whole or singly, with the precious metals, and amalgamate *only* gold and silver, and produce bullion finer than coin, and oftener above 950·1000 fine than under it, and will prove it can be done on a scale of 100 tons a day as easily as 100 pounds.

2d. That the large body of silver ores now put through the process of roasting can be more profitably worked without it and all bullion be free of base, or, rather, 950·1000 fine.

3d. That by the disintegration of ores and chemical applications, I can generate, in a *practical amalgamating machine*, so much electricity as to defy the strength of the strongest man—not only that, but be dangerous to handle.

4th. That I will amalgamate gold so fine that paper can be gilded with it.

5th. That there is no such thing as gold being in any other condition than metallic—in other words, that gold is a simple.

6th. Taking ores from any of the leading gold mines of California that the best mills, working stamps, copper plates and blankets, do not get, on an average, 40% of the full value of the ore.

7th. That the majority of mills of California working as above, do not average one-third the value of the ores, and that the great bulk of the gold lost is atomic gold, and gold so fine that paper can be gilded with it in its natural state.

I make the above declarations as important and practically deduced facts for such of the mining community who can appreciate advancement. Now, some may say if I can do all this, I ought to be a very rich man—that all I should want would be bags to put the gold in. But such is not the case. My mind has been too many years absorbed (very foolish in me for my own interests, I must admit,) in these experiments, and so much so that I forgot how to make money, and only remembered how to spend it. I propose, however, to change this programme, and now will endeavor to turn experience to some purpose. Really, Mr. Editor, I must beg pardon for making so long and free an answer to so short a letter, but my ideas run away with my pen. More anon. Yours,

ALMARIN B. PAUL.

San Francisco, March 1st, 1879.

MECHANICAL PROGRESS.

A New Iron Car.

Since the first railroad became a practical success efforts have been made with unusually poor results to make good cars of the same material as the tracks. Two classes of men have been experimenting. One composed of engineers, who have not made sufficient allowance for the strains developed in practical use, such, for instance, as an occasional collision, and went to the extreme of light construction; the other class of practical car builders started on the basis of their experience in wood-working, and not only used too much iron, making their cars heavy and costly, but used it in forms not well calculated to give good results, because the material was not applied in a way to secure its full strength. A couple of Buffalo gentlemen, who combine both energetic and practical training, have recently invented and patented an iron car which is expected to strike the happy mean. The inventors are Charles H. Kellogg, engineer of the Kellogg bridge works, and Mr. John W. Seaver, mechanical engineer of the same establishment. Several trial cars are now being constructed for the Buffalo & Southwestern railway so that the results of their practical use will soon be known. These gentlemen claim that if an iron car can be made strong enough to cut through any wooden car in a collision, and to keep its shape even when thrown from the track, it will last practically forever, that is, of course, excepting the necessary renewal of wearing parts. By their improved construction platform cars can be built for $500, and they will make contracts at these figures. The improved car uses, however, a patent semi-elliptic spring, costing about $50, which would make the two cost just the same as if built on the old plan.

One novelty in construction is the entire absence of any truss rods under the frame, all the iron that would have been used in them being added in the form of two additional longitudinal sills. The truss rods were good enough in resisting dead weight, but, in case of accident, the frame would buckle sideways or upward and the rods gave not a bit of resistance. As now built, the frame has six sills of channel iron, giving great stiffness in all directions, while at the same time, making the weight of iron used the minimum. Every piece is riveted in its place and no dependence is placed on bolts and nuts. A large factor of safety, seven, is allowed in estimates of strength of the trucks, while five is the factor of the box frame. In a form of coal car now being manufactured, every part is iron or steel, even to the floor, sides and cross-bars on the brakes. This iron floor of riveted plates adds largely to the strength, but no allowance is made for that in the estimates. The inventors make a point of the arrangement of the swing motion and springs, a special patent covering that construction. The arrangement is such that the springs cannot be overloaded, as after dropping to a certain point, or in case of breakage, the weight is taken up by the bearings and the springs entirely relieved. In going around curves the body swings in a sort of parallel motion from the spring hangings and settles easily back on the bearings when the curve is passed. In every part of the work rolled iron of the form best adapted to meet the peculiar strains of the situation are used, and the result is a car weighing but eight tons that will carry 20 as easily as the old wooded cars can get along with 12.

We clip the above from the Buffalo *Courier*. In regard to the wear of iron cars heretofore and the prejudice which exists against them, a correspondent of the *Railroad Gazette* says: Some 20 years ago the New York Central & Hudson River Railroad Company added to their rolling stock 500 iron box cars, the floor framing being of six sills of riveted channels, and the box of 2 × 2 × ¼ angle irons, covered with iron 1-10 of an inch thick. The bodies were all iron, excepting the floor and a lining some three feet high. These cars, after 20 years' use, are to be found upon the main line and its connections, in apparently as good condition as when new. Occasionally there is one with a small patch in the side where the iron has rusted through. Notwithstanding this good service, a number of minor officials and employees of this road persist in condemning iron cars in general, and invariably say: "Our company built 500 of them 20 years ago, and have not built any since; therefore they are good for nothing." Now let us ask the reason thereof.

If these cars, built at a date when the knowledge of iron construction was in its infancy, will pass through 20 years of service unharmed, is it not safe to conclude that, with the improved shapes of iron at command, together with the experience developed by the greatly increased use of iron in bridges, buildings, etc., where it is superseding wood daily, that a car possessing the essential requirements of good rolling stock, viz., lightness, strength and durability, with easy access to wearing parts, and lastly, and probably one of the most important qualities, cheapness of manufacture, may be produced? Possibly the true reason for this animosity to iron cars in general by these gentlemen is that, as a class, they are men unskilled in the construction of iron, their experience being confined to wood, and that it is but natural they should give preference to a form of building with which they are familiar, and condemn any innovation in their branch of work that would necessitate either their learning what would be comparatively a new profession, or being superseded by men who possess such knowledge.

Composite Ships.

Notwithstanding that the mixed construction of vessels has been tested and found wanting in the elements of strength and durability, both by the government and by individual shipowners, still there are those who adhere to its fortunes, and advocate the adoption of this type of construction as adapted to the general want. There are four prominent objections to composite vessels: 1st. Wood and iron do not work well together, unless the iron is galvanized, and this would make the vessel too costly for general service. 2d. The frame should be stronger than the planking. There is so much of common sense in this to a practical mind, that we need not pause to discuss the question. This required strength can only be obtained by increasing the number of frames in the vessel, or making them much larger, and indeed both are a necessity. 3d. The security of the butts of the planking is insufficient, especially at the wood ends, where a nut cannot be put on the end of the screw bolt in the vicinity of the deadwood. This leaves the wood ends insecurely fastened. The butts elsewhere also have no solidity of fastening. The plate extending from frame to frame to receive the butt is a sham at best. The frames should be sufficiently near each other to become the recipients of a scarph nib on each frame, and the planking should be scarphed flatwise, or, in the thickness of the plank; in a 4-inch plank, the inside nib may be 1½ inches, and the outside nib, 2½ inches; the inner nib should be tight, and the outer one calked, showing only one butt, the scarph extending across both frames, and receiving fastening through both frames. The fourth objection is in the small fastenings, the bolts are too small to hold the planking solid for calking. The points of the holts do not fill the holes in the frames, and cannot be made to fit unless the points are of reduced size, and then they would be of insufficient strength. The calking of composite vessels is of the boat calking type, mere chintzing compared to the solid calking of a wooden vessel. In the very nature of the materials it is quite impossible to have drift sufficient to make the fastening tight in the wooden plank and loose in the iron frame, and yet have solid work. When composite vessels are built, the planking should be sufficiently thick to receive edge bolting between alternate frames. As a general rule, however, ship-owners have been more anxious to show that the composite is the cheaper than that they are the better vessel. Ship-owners, as well as underwriters, will learn by experience, if in no other way, that the best ship is the cheapest.—*The American Ship.*

The Great Government Testing Machine.

The great testing machine designed by Mr. Albert Emery, for the United States Commissioners for testing iron and steel, which has been in process of construction for three years past at the Watertown (Mass.) Arsenal, is now completed. Some experimental tests made with it in the presence of the Commissioners are thus described by the Boston *Traveler:*

The merit of this new testing machine lies in its great power united with its mathematical accuracy. In illustration of this, a few of the interesting results it has reached in the course of the recent experiments may be cited. A five inch bar of iron was pulled apart, and the strain registered in doing it was 772,000 pounds. To attest its minute exactness, a horse hair was next submitted to the strain, and it yielded to a registered force of two pounds. Again, a pine blocks of four inches thickness and two feet in length was taken and pressed into a board of two inches thickness. Then, to again ascertain refinement of accuracy, a hen's egg was taken and inclosed in plaster of Paris, with two small holes in each end, and, the pressure being applied, the contents were forced out of these apertures at a strain of 25 pounds, and such is the command over the action of the machine that the pressure was stopped in an instant, and the yolk ceased to be expelled, the shell of the egg remaining unbroken. A nut was also cracked by the machine without crushing the kernel. No such nicety of regulated pressure, combined with such an enormous range of power and absolutely exact registration of the strain exerted, has ever before been attained.

PROGRESS OF STEAM ENGINE ECONOMY.—With Smeaton's early Newcomen engines the consumption of coal was 29.76 lbs. per hour per horse power. Afterwards, as improved, 17.6 lbs. In 1811 the Cornish pumping engine required 10.87 lbs. per hour per horse power; in 1842 the improvements had reduced it to 2.90 lbs. In 1863 the best marine engines consumed 4 lbs. of coal per hour per horse power, but in 1872 only 2.11 lbs. were required.

THE most fatal disease that threatens the vitality of many of our oldest and largest machine establishments is *Conservatism.* When a concern settles down to running on its accumulated reputation, without an effort to improve its patterns, processes or style of work, the disease will surely enfeeble it, while its enterprising rivals push ahead, until the crisis approaches and it is forced to cry, "help me, Cassius, or I sink."—*American Machinist.*

SCIENTIFIC PROGRESS.

The Origin of Comets.

In the exposition of his theory of the development of the solar system, Kant supposes the comets to be formed from the matter of the condensing solar nebula. By him they were regarded as planets, which, in some way, had been thrown out of their normally circular orbits. Laplace, on the other hand, in his exposition of the nebular hypothesis, took the ground that comets were formed from the matter which is scattered through the stellar spaces, and that in their origin they have no relation with the solar nebula. Have we, in the accumulation of facts since the days of Kant and Laplace, learned anything that may help us to decide between these theories? Such is the inquiry proposed by Prof. H. A. Newton, who in a recent number of the *American Journal of Science and Arts,* considers: First, what peculiarities each of them requires in the shape and distribution of the cometic orbits; and, second, compares with the theories the facts that have been observed with regard to the paths of 247 comets. The cometic paths are represented by the writer in two graphic curves, and when the results of actual observations are put into the same form, it is at first found that the curve thus obtained differs from both the theoretical ones. However, as the known comets all have their perihelion (that part of their orbit nearest the sun) within the orbit of Mars, and are exposed to planetary disturbances, the author calculates the influence of these disturbances, and arrives at the conclusion that the curve corresponding to the actual cometary paths is thus brought into good agreement with the theoretical curve deduced from Laplace's hypothesis, whereas it does not agree so well with that deduced from Kant's. It would seem, then, that the origin of comets must be placed in interstellar space.—*Scientific American.*

THE LAW OF THE TELEPHONE.—M. Hermann, has adduced certain experiments to show that du Bois Reymond's theory that the action of the telephone can be explained from the general law of induction in which the bending of the iron plate is taken into account, and the induction of the current path upon itself is neglected, does not explain the facts observed. Prof. H. F. Weber has written a paper in which he showed that Hermann's experiments agreed entirely with the theoretical laws of induction, and that Reymond was wrong in neglecting the induction of the current path upon itself, which last was really the principal agent in producing the agreement between theory and practice. Ten days later Helmholtz presented a paper to the Berlin Academy which covered the same ground as Prof. Weber's paper. The general results of these papers are as follows: (1.) "In the telephonic circuit the tone is in general altered." (2.) "The phase-displacement that occurs during the telphonic transit is not a constant quantity, its amount changes with the constitution of the path of the current, and depends on the number of vibrations." (3.) "In certain cases, however, the amplitude of the induced current becomes independent of the vibration number, and thus the tone of the exciting sound is unchanged."

A TOADSTOOL WITH THE ODOR OF CHLORINE.—A writer in the December number of the *Bulletin* of the Torrey Club records his discovery of a toadstool, which was exhaling a strong odor of chlorine when found, and which has been described as a new species by Mr. C. H. Peck, under the name of *Agaricus chlorinosmus.* The writer states that "there could be no doubt that the plant was exhaling chlorine, since there is no other substance known having the same, or even a remotely similar odor." From this he draws the inference that the "chlorine was taken up from the soil by the plant, in the form of a chloride, most probably the chloride of ammonium, or possibly of sodium." As a comment on this, the editor of the *Bulletin* calls attention to the fact that the Californian *eschscholtzia* is well known to have a colorless juice but with the odor of hydrochloric acid; yet this juice, on being tested, has been found to give not even a trace of chlorine, and "perhaps the same result will appear in the case of the new agaris." The odors of different fungi, like those of flowering plants, are almost as numerous and varied as the species themselves.—*Scientific American.*

THE BUBBLE IN SPIRIT-LEVELS.—In a recent part of the *Comptus Rendus* it is recorded that M. Plantamour made some observations upon the displacement of the bubble in spirit-levels, and found that there was a daily maximum during the afternoon, accompanied by gradual changes, which extended over a period of several successive days. In confirmation of his observations, M. d'Abbadie reported his own experience at Olinda, Brazil, in 1837; at Gondar, Ethiopia, in 1842; and subsequently, at Saqa. At each of these places the bubbles of the levels showed small variations in the direction of the plumb-line. Astronomers have doubtless suffered from these changes, without being aware of their cause, and have been obliged to mask them by taking the means of frequent observations.

POPLAR TREES AS LIGHTNING CONDUCTORS.—Observation has induced a very popular belief in Europe and throughout the northern Atlantic States, where poplar trees are cultivated, that lightning strikes these trees in preference to all others. Prof. Asa Gray, in a note to the *American Agriculturist,* says that the reason which lies at the bottom of this wide-spread opinion is coming to light. Green herbage, and green wood—sappy wood—are excellent conductors of electricity. A tree is shattered by lightning only when the discharge reaches the naked trunk or naked branches, which are poorer conductors. An old-fashioned Lombardy poplar, by its hight, by its complete covering of twigs and small branches, and their foliage down almost to the ground, and by its sappy wood, makes a capital lightning-rod, and a cheap one. Happily no one can patent it and bring it round in a wagon and insist upon trying it. To make it surer, the tree should stand in a moist ground or near water, for wet ground is a good conductor, and dry soil a poor one. It is recommended to plant a Lombardy poplar near the house, and another close to the barn. If the ground is dry, the nearer the well the better, except for the nuisance of the roots that will get into it.

THE PLANET MARS.—Prof. Lockyer is of the opinion that human life on the planet Mars may be very much like human life on the earth. The light cannot be so bright, but the organs of sight may be so much more susceptible as to make the vision quite as good. The heat is probably less, as the polar snows certainly extend further, but by no means less in proportion to the lessened power of the solar rays. The professor agrees with others that several remarkable seas—including inland seas, some of them connected and some not connected by straits with still larger seas—are now definable in the southern hemisphere, in which, as in the case also with the earth, water seems to be much more widely spread than in the northern hemisphere. There is, for example, a southern sea exceedingly like the Baltic in shape; and there is another and still more remarkable sea, now defined by the observation of many astronomers—one near the equator, a long straggling arm, twisting almost in the shape of an S laid on its back, from east to west, at least 1,000 miles in length, and 100 miles in breadth.

A NEW CHEMICAL—SILICIURETED HYDROGEN.—We have received from Dr. Theodor Schuchardt, of Goerlitz, a specimen of a new body which he calls silicium strontium. It is formed from the preparation of metallic strontium by electrolysis, but no particulars are given as to the substances present or the reaction by which it is formed. As received from Dr. Schuchardt, the compound is a gray powder with a slight odor resembling phosphuretod hydrogen. When mixed with diluted hydrochloric acid, a rapid evolution of the spontaneously inflammable siliciureted hydrogen takes place. No particulars as to price are mentioned, but, if obtainable in any quantity, this compound will probably be the readiest source of siliciureted hydrogen.—*Chemical News.*

SOLIDS IN SOLUTION.—There is something quite remarkable in regard to solids in solution. When in solution they assume the mechanical properties of liquids. The entire mass of the solution is in the liquid state, and, to all appearance, the molecules of the dissolved solid are as truly in the liquid condition as those of the solvent. Yet the molecules of the solid have not suffered any change of chemical composition. The natural inference then is, that they have experienced a change of mechanical condition. Something, perhaps, similar to the allotropic conditions of sulphur, phosperous, etc. The alternative supposition is that the physical molecules of the solid are more complex than the chemical molecules, and in the process of solution are broken up into others less complex, which, in their association, have the mechanical properties of a liquid.

ATMOSPHERIC VAPOR.—It is maintained by Dr. J. M. Anders that a large proportion of the vapor of the atmosphere may be accounted for through the process of transposition from plant life, where there is about from 25% to 30% of woodland in the country, and on this ground, considers that the practice of forest culture should be highly commended as a means of improving atmospheric conditions.

THE Telectroscope is the name proposed for a new apparatus designed by M. Senlecq, and which we are informed by *Nature,* is designed to reproduce, telegraphically, at a distance, the images obtained in the camera obscura. In this device the inventor has utilized the lately-observed sensitiveness of selenium to various shades of light.

GAS AND WATER PIPES AS A SOURCE OF ELECTRICITY.—Mr. C. O. Gregory, in a communication in the *English Mechanic,* states that he has successfully used the gas and water pipes in his dwelling as a source of electricity for a microphone. He connects one of his microphone wires with the gas pipe, the other with the water pipe, and finds the current ample, and, of course, constant.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 20.		Week Ending Feb. 27.		Week Ending Mar. 6.		Week Ending Mar. 13.	
Alpha	21	15¾	21	18¼	20	17¼	19¾	18
Alta	7½	7	6⅞	5¼	5⅝	5	5¼	5
Andes	50c	65c	60c	50c	50c	45c	50c	40c
Alps	....	....	....	....	....	....	....	....
Argenta	65c	60c	1	90c	1.40	1	1.35	1.10
Atlantic	....	....	....	....	....	....	..	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1	....	1¼	1	....	....	....	....
Belcher	8½	7½	7¼	6¼	6⅞	6	9	6⅝
Belmont	55c	50c	50c	40c	50c	45c	1	40c
Best & Belcher	25¼	24	24	24¼	20	17¾	19½	17⅞
Bullion	8⅝	7½	7⅞	6⅞	6¼	4	6	5¼
Bechtel	70c	55c	75c	50c	85c	50c	75c	60c
Belle Isle	30c	....	30c	....	35c	30c	35c	30c
Bodie	7½	2¼	7⅝	6¾	7	6	6½	5½
Benton	5¼	5	5	4.40	4½	3.90	4.20	3⅞
Bulwer	16	16½	20	18	19½	17¼	18	15
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.05	65c	1.40	85c	2	1.40	2⅝	1.60
Belvidere	1.40	80c	60c	40c	85c	50c	65c	60c
Booker	45c	55c	50c	40c	1	40c	1	60c
Caledonia	3.10	2.90	2⅞	2.55	3⅞	2	3.20	2.70
California	7⅞	7⅝	7⅞	5⅞	6½	5⅝	6	5⅝
Challenge	3.95	3	3.70	3	3	2¼	3½	2.65
Chollar-Potosi	49½	48	49	46	46	39½	45	39½
Comanche	....	....	....	....	....	....	....	....
Confidence	17¼	15¼	16¼	14	14¼	12¼	15¼	13
Con Imperial	1.35	1.05	1.30	1.15	1.15	1	1.40	1
Con Virginia	7¾	7¼	7¼	5¾	6¼	5⅞	5⅞	5¼
Crown Point	6½	6	5⅞	4¾	5¼	4.40	6⅝	4.90
Con Washoe	....	....	....	....	....	....	....	....
Champion	....	....	10c	....	45c	25c	25c	20c
Concordia	....	....	....	....	25c	15c	....	....
Dayton	50c	....	....	....	50c	....	....	....
DeFrees	10c	....	10c	....	5c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	30c	....	30c	25c	35c	30c
Eureka Con	30	29¾	29	27½	29	27½	28	27½
Exchequer	7	6	7½	5½	5½	4.60	5½	4¾
Endowment	20	15	15c	5c	10c	5c	5c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	5⅞	5	5	4.60	4.80	4½	5¼	4.55
Gila	5c	....	30c	5c	30c	25c	30c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	5½	10	9	10	9	58c	50c
Goodshaw	50c	45c	50c	....	60c	45c	55c	25c
Gould & Curry	14¾	13⅝	13⅝	11⅞	11¼	9¼	10⅝	9¼
Hale & Norcross	18¾	17	17¼	15⅞	16¼	14¼	17	14
Hillside	2¼	2	2.65	2.40	2.60	2¼	2.60	2½
Highbridge	1¼	1	80c	60c	75c	55c	60c	55c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	30c	25c	20c	....	15c	....
Independence	2	1.80	1.80	1¾	1.60	1.35	1.90	1.60
Julia	4.20	3.90	5¼	5⅛	5⅝	4.60	5⅞	5½
Justice	5½	5½	5½	4	4½	4	4.30	4
Jackson	7¼	6	7¼	7	7½	7	8	7¾
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6½	5⅞	5⅞	4⅞	5⅝	4½	5⅝	4⅞
Kossuth	20c	15c	25c	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.90	1¼	1.95	1¾	1.65	1	1.30	1.10
Lady Wash	1.90	1.60	1.70	1¼	1.45	1	1.20	1.10
Leopard	1	90c	85c	50c	85c	70c	80c	75c
Leviathan	65c	55c	65c	50c	50c	40c	35c	25c
Leeds	80c	75c	1	60c	1	70c	70c	....
Lee	....	....	....	....	....	....	....	....
May Belle	10c	....	....	....	....	....	25c	....
Modoc	....	....	10c	5c	10c	....	10c	....
Manhattan	3	2½	2.90	2¼	2½	1¼	1.60	1¼
Martin White	5	....	6	5⅝	7	6	7	6¾
McClinton	85c	40c	75c	60c	90c	75c	80c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	40¾	38½	47½	39½	43	37¾	41	36½
Mides	....	....	....	....	1¼	....	....	....
Morning Star	....	....	....	....	3	....	....	....
North Con Virginia	11¼	9	14¾	10	12½	10½	13	10½
New York	85c	60c	65c	45c	50c	30c	50c	25c
Northern Belle	10	9	10	8	9½	9	10½	9¾
New Coso	...	....	....	....	....	....	....	....
Navajo	25c	20c	20c	15c	20c	15c	30c	25c
Occidental	....	....	....	....	....	....	....	....
Ophir	42	39¾	43½	40	41½	35½	37	34¾
Oriental	5c	....	20c	15c	15c	5c	10c	5c
Overman	12	11	10¾	9½	12⅝	10¾	12¾	11½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	2	....	....	....
Phil Sheridan	30c	25c	50c	40c	45c	25c	40c	35c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	6⅛	6¼	5	6	5	6¾	6
Richer	65c	....	1	....	1	75c	75c	65c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15⅝	14	13¾	13	13½	11⅛	14	11
Seg Belcher	25	24	27	....	....	....	27	25
Sierra Nevada	49	46½	57	47¾	48¾	45	47	44⅝
Silver Hill	2.70	2.40	2½	2	2¼	1.95	2.20	1.90
Silver King	9½	9¼	10	9¼	8½	....	8½	8
Silver Prize	....	....	10c	....	....	....	....	....
Succor	1	65c	60c	45c	50c	30c	50c	40c
Summit	2.65	2.15	3¾	2.30	3	2.15	2½	2
Scorpion	1.60	1.40	1.70	1½	1½	1	1.60	1¼
Solid Silver	60c	55c	60c	55c	65c	40c	50c	40c
South Bodie	30c	....	30c	....	30c	....	30c	25c
South Standard	....	....	....	....	....	....	....	....
Star	75c	....	75c	70c	60c	....	60c	50c
St. Louis	....	....	50c	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1.70	1.40	1¾	1¼	1¾	1.40	1¾	1.55
Tiptop	1¼	90c	1	90c	90c	70c	65c	55c
Trojan	35c	25c	30c	25c	50c	25c	25c	20c
Union Con	68	61	90	67½	78	68	76½	66
Utah	18	16	20	16¾	17	13½	18	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1.20	2.05	1.35	1.55	1.20	1¾	1.40
Wells-Fargo	20c	15c	15c	....	20c	15c	15c	5c
Woodville	....	....	25c	....	25c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	22½	20½	22½	20	19	17	20	16⅝

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 7.

200 Andes....40c
320 Alta....5¼@5
10 Alpha....18
140 Best & Belcher...18@17¾
750 Bullion....5¼
490 Belcher....6⅝@6½
290 Benton....4
1265 California....5⅝@5½
250 Crown Point...4.70@4.80
2605 Con Imperial....1.05@1
250 Caledonia....2.70
150 Confidence....13@13¼
115 Challenge....2⅝@2.65
65 Chollar....39½@40
895 Con Virginia....5⅝@5¼
180 Dardanelles....2
215 Exchequer....4¾
600 Flowery....85@80c
755 Gould & Curry....9⅝@9½
305 Hale & Nor....14
400 Justice....4.10@4
2230 Julia....5⅝@5⅝
30 Kentuck....4¾
160 Lady Bryan....1.20
110 Lady Wash....1.10
700 Leviathan....30c
665 Mexican....36½@37¼
200 North Con Vir...10½@10¾
990 N Bonanza....1½
360 New York....50@45c
90 Overman....11¼@11⅝
500 Ophir....35@35¼
330 Sierra Nevada....45@44¾
590 Savage....11@11⅛
100 S Potosi....2.05
940 Silver Hill....2.10@2
650 Solid Silver....50c
600 Succor....45c
245 Scorpion....1.40@1¼
250 Trojan....25@20c
100 Utah....13¾@13½
135 Union Con....66@66½
100 Wells-Fargo....15c
1550 Ward....1½@1.40
430 Yellow Jacket....16¾@16⅝

AFTERNOON SESSION.

610 Argenta....1.15@1.10
400 Albion....40@35c
200 Belmont....45c
910 Bechtel....70@65c
65 Bodie....6@6½
100 Belvidere....60c
70 Bulwer....16⅝
300 Black Hawk....1.65
100 Belle Isle....35c
100 Booker....70c
250 Champion....20c
120 C Pacific....1½
100 Caledonia (B H)....2.20
100 Chieftain....15c
100 Dudley....90c
100 Day....30c
40 Eureka Con....28
300 Esmeralda....1
50 Endowment....5c
125 Goodshaw....45c
160 Grand Prize....4.55
15 Golden Terra....9
100 Giant & O A....4½
100 Hillside....2½@2.60
450 Highbridge....60c
380 Independence...1.70@1⅝
50 Jackson....8
270 McClinton....75@80c
100 M White....6⅝
100 Minnietta Belle....25c
330 Mono....2¼
30 Manhattan....1½
400 Navajo....30c
500 Oriental....10c
450 Paradise....1⅞@1.80
10 Raymond & Ely....6½
50 Real del Monte....2
1200 Star....50@60c
65 Silver King....8
100 S Bodie....25c
735 Summit....2¼@2.40
760 S Bulwer....80@75c
175 Tiptop....55c
3025 Tuscarora....5@10c
150 Tioga Con....1.80

Saturday A. M., Mar. 8.

25 Alpha....18
270 Alta....5¼@5¼
45 Andes....40c
260 Argenta....1.15
110 Best & Belcher..18¾@18½
690 Belcher....6⅝@6½
925 Bullion....5¼@5½
340 Booker....60c
610 Bodie....6
370 Benton....4.20@4.05
330 Bulwer....15@15½
100 Belvidere....60c
150 Bechtel....60c
100 Belmont....40c
100 Belle Isle....35c
330 Black Hawk...1.60@1.70
300 Con Esmeralda....1
640 Con Virginia....5¾
460 California....5⅝@5⅝
140 Confidence....13¼
260 Chollar....40¼@41
240 Crown Point...4.80@4.90
2455 Con Imperial....1.05@1
100 Champion....25c
350 Challenge....2¾
520 Caledonia....2.80@2.90
80 C Pacific....1.70@1½
1400 Caledonia (B H)..2.10@2
365 Dardanelles....2.10
250 Dudley....90@85c
190 Exchequer....5
205 Eureka Con....27¼@27¾
325 Flowery....80c
915 Gould & Curry....9⅝@9¾
80 Grand Prize....4.55
500 Goodshaw....25@40c
60 Golden Terra....50c
325 H & Norcross....14⅝@14¾
500 Highbridge....60@55c
45 Hillside....2½
100 Independence....1.60
370 Justice....4.10@4.20
1175 Julia....5⅝@5¾
100 Jackson....8
5 Kentuck....5
100 Kossuth....15c
300 Leviathan....25c
860 L Bryan....1.20@1.30
50 Lady Wash....1.15
575 Mexican....40@39½
200 Mackey....3.70
65 M White....7
50 Manhattan....1½
220 Mono....2.20@2.10
250 McClinton....75c
500 New York....25c
220 Navajo....25@30c
160 N Con Virginia...13@12¾
1325 N Bonanza....1½@1.40
500 Northern Belle....9¾
340 Ophir....36¾@37
125 Overman....12@12¼
55 Phil Sheridan....35c
650 Paradise....1.80@2.85
525 Raymond & E....6¼@6
1056 Savage....11¾@11⅝
850 Succor....50@45c
150 Sierra Nevada....46¾@47
280 Silver Hill....2.10
350 Solid Silver....50c
1660 Star....50c
750 Scorpion....1½
100 S Potosi....2.05
100 S Bulwer....75c
100 South Bodie....25c
450 Summit....2½
100 Silver King....8½
25 Tuscarora....10c
615 Tiptop....50@55c
150 Tioga....1.60@1½
440 Union Con....75@72
230 Utah....14@14½
1295 Ward....1.70@1¾
200 Wells-Fargo....15c
590 Yellow Jacket...17¼@17½

Monday A. M., Mar. 10.

725 Alta....5¼@5½
120 Alpha....18@18½
130 Best & Belcher...19¼@19⅝
280 Belcher....7⅝@7¾
640 Bullion....5⅞@6
510 Benton....4.15@4.05
25 Chollar....42
750 California....5¾@5½
350 Con Virginia....5⅝@5¼
190 Crown Point....5¼
390 Con Imperial....1.05@1
410 Challenge....3
540 Caledonia....3¼@3.20
220 Confidence....14@14½
220 Dardanelles...2.15@2.20
360 Exchequer....5½@5⅝
1150 Flowery....80@85c
265 Gould & Curry...10¼@10½
200 Hale & Nor....16@15⅞
235 Justice....4¼@4.30
435 Julia....5½@5⅝
105 Kentuck....5
80 Lady Bryan....1¼
885 Leviathan....25@30c
390 Mexican....40½@41
150 Mackey....3.80@3¾
240 North Con Vir...12¾@12½
1440 N Bonanza....1.95@1.60
225 Ophir....37@36¾
160 Overman....12¼
200 Phil Sheridan....40@35c
500 Solid Silver....45c
200 Savage....13⅝
360 Sierra Nevada....46½@47
1020 Silver Hill....2.05@2.20
110 S Potosi....2.05
750 Succor....45c
40 Seg Belcher....25
375 Scorpion....1½@1.60
100 Trojan....25c
50 Utah....17¾
370 Union Con....75@76½
755 Ward....1.65@1¾
625 Yellow Jacket....18@18⅝

AFTERNOON SESSION.

150 Albion....40c
375 Argenta....1.15@1¼
800 Belmont....45@50c
200 Belle Isle....30c
385 Bodie....6
250 Bechtel....70@65c
1300 Booker....80@75c
300 Belvidere....60c
310 Bulwer....16@15½
1610 Black Hawk....2@2.15
1200 Caledonia (B H)...1.90@2
100 Con Pacific....1½
100 Day....30c
225 Dudley....80@75c
40 Eureka Con....27¾
75 Endowment....5c
665 Grand Prize....4.70@4.85
300 Gila....30c
420 Goodshaw....40@45c
40 Giant & O A....4½
5 Golden Terra....8
150 Hamburg....50c
60 Hillside....2½
840 Highbridge....60@55c
25 Independence....1.60
250 Jackson....8
745 Leopard....75@80c
180 Mono....2¼@2.20
450 McClintou....75c
50 May Belle....25c
420 Modoc....10c
50 Northern Belle....9⅝@10
780 Navajo....25@30c
100 Oriental....5c
1005 Paradise....1.95@2
650 Raymond & Ely...6½@6⅝
200 Richer....70@75c
215 Standard....20
1000 Star....50c
120 S Bodie....25c
730 S Bulwer....75@80c
220 Summit....2.40
2025 Tuscarora....5@10c
425 Tioga Con....1.55@1.60
10 Tiptop....65c
400 University....75c

Tuesday A. M., Mar. 11.

130 Alta....5¼@5½
110 Alpha....18½@18¾
200 Andes....40c
110 Best & Belcher....18¾
495 Belcher....7¾@7¾
405 Bullion....5⅛@5¼
230 Benton....4@3.90
80 California....5¾
345 Caledonia....3@3.10
1195 Con Virginia....5⅝@5¼
5370 Con Imperial..1.05@1.10
60 Chollar....42
325 Crown Point....5½@5
30 Confidence....13¾
720 Challenge....3
1390 Dardanelles....1@1½
860 Exchequer....5
450 Flowery....75c
835 Gould & Curry....9⅝@10
190 H & Norcross....16½@16½
260 Justice....4¼@4.20
715 Julia....5½@5⅝
125 Kentuck....5¼@5⅝
600 Lady Bryan....1¼
100 Lady Wash....1.20
400 Leviathan....25@30c
565 Mexican....40½@41
150 Mackey....3.80@3.90
350 New York....40@50c
300 North Con Vir....11¼@11
625 N Bonanza....1¾@1.80
155 Ophir....36½
20 Overman....12¼
400 Phil Sheridan....35@40c
100 S Potosi....2.05
565 Sierra Nevada....46@46¼
440 Savage....13¾@13¼
660 Silver Hill....2@2.05
700 Succor....45@40c
600 Solid Silver....45c
405 Scorpion....1½
300 Trojan....25@20c
205 Utah....18
400 Union Con....75@74
100 Wells-Fargo....5c
600 Ward....1.65
360 Yellow Jacket...16¾@18¾

AFTERNOON SESSION.

100 Argenta....1¼@1.15
100 Albion....40c
920 Booker....80c@1
155 Bodie....5¾@5½
250 Bechtel....70@65c
150 Belvidere....60@55c
245 Bulwer....17¾@18
850 Belmont....70@80c
665 Black Hawk....2¼@2½
50 C Pacific....1.70
200 Caledonia (B H)....2
200 Day....30c
900 Dudley....60@75c
70 Eureka Con....28
325 Giant & O A....4½
300 Goodshaw....55c
400 Grand Prize....5@5¼
200 Gila....30c
295 Hussey....15c
500 Hillside....2½
375 Hamburg....50@60c
500 Highbridge....60c
50 Independence....1.60
350 Jackson....8
1970 Leopard....75@80c
50 Minnietta Bell....25c
305 Mono....2¼@2.10
400 McClinton....75c
200 Modoc....10c
300 M White....6⅝
270 Northern Belle....9⅝@10
150 Navajo....25c
2000 Oriental....5c
185 Paradise....1.90@1¾
300 Raymond & Ely....6¾
100 Richer....65c
200 Star....50c
100 S Bodie....30c
275 Silver King....8½
550 Summit....2@2.10
720 S Bulwer....75@80c
1025 Tuscarora....5@10c
100 Tiptop....65c
1125 Tioga Con....1.60@1¾
900 University....75@65c

Wed'sday A.M., Mar. 12.

315 Andes....50@40c
230 Alpha....19
290 Alta....5¼@5⅝
100 B & Belcher....19¾@19½
575 Bullion....6
735 Belcher....7⅝@8
325 Benton....4@3.95
20 Chollar....43
530 Con Virginia....5⅝@5¼
285 California....5¾
675 Crown Point....5½@5⅝
195 Caledonia....3
4115 Con Imperial..1.20@1.15
10 Confidence....14¼
1120 Challenge....3@3.10
2250 Dardanelles....1@1½
450 Exchequer....5⅜
200 Flowery....75@80c
365 Gould & Curry...10⅜@10⅝
730 Hale & Nor....17@16½
60 Justice....4¼@4.20
540 Julia....5⅝@5⅝
50 Kossuth....15c
800 Leviathan....35@30c
100 Lady Bryan....1¼
170 Lady Wash....1.20
185 Mexican....40@39⅞
100 Mackey....3.80
200 North Con Vir..11¼@11¾
255 New York....45@40c
350 N Bonanza....1.80@1.70
60 Overman....12¼
480 Ophir....35¾@35½
425 Phil Sheridan....35c
800 Succor....40c
260 Savage....14
190 S Nevada....46⅝@46¼
400 Solid Silver....45@40c
370 Silver Hill....2@1.95
100 S Potosi....2.05
100 Trojan....20c
60 Utah....18@17⅞
400 Union....73@74
1050 Wells-Fargo....10c
1570 Ward....1.65@1¾
330 Yellow Jacket...19½@19⅞

AFTERNOON SESSION.

80 Albion....25c
825 Argenta....1.35@1¼
90 Bulwer....17½@16½
615 Bechtel....65@75c
270 Bodie....5⅞@6¼
685 Black Hawk....2¼@2⅝
3055 Belmont....80c@1
200 Belle Isle....30c
370 Booker....90@80c
100 Caledonia (B H)....1.95
550 C Pacific....1.70@1¾
650 Day....30@35c
120 Dudley....75c
30 Eureka Con....27¾
50 Esmeralda....90c
165 Grand Prize....4.90@5
525 Giant & O A....4¾@5
200 Hamburg....50c
600 Highbridge....60c
50 Hillside....2½
150 Hussey....15c
270 Independence....1.90
100 Jefferson....30c
90 Jackson....8@7⅞
900 Leopard....75@80c
240 Leeds....70c
250 McClinton....70@60c
45 Manhattan....1.60@1½
40 M White....6⅝@6¾
260 Mono....2¼@2.20
100 Modoc....10c
100 Northern Belle..10½@10⅝
450 Oriental....5c
430 Paradise....1.70
80 Real Del Monte....2¼@2
300 Raymond & Ely...6⅝@6¼
700 Richer....65c
500 S Bodie....30c
1030 Summit....2@2¼
950 S Bulwer....85@80c
85 Silver King....8½
90 Standard....20c
800 Star....50c
1215 Tiptop....65c
75 Tioga Con....1¾
1525 Tuscarora....5@10c
300 University....65c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery st
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3	20	Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Florence Blue Gravel M Co	California	3	03	Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1	50	Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Hussey Con G & S M Co	Nevada	7	15	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	1 00	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Phil Sheridan G & S Co	Nevada	8	15	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Yellow Jacket S M Co	Nevada	31	1 00	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Black Hawk G M Co	California	4	25	Dec 10	Jan 11	Mar 20	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	05	Jan 13	Feb 17	Mar 21	Wm A Van VanBokkelen	309 Cal
Carmelo Bay Coal Co	California	2	25	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 17	Apr 2	J T McGeoghegan	316 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hanover Con M Co	California	2	25	Jan 30	——	Mar 24	Wm A Andoe	327 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
MariposaLand & M Co	California	15	1 00	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Apr 9	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Taul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Ætna M Co	Arizona	J S Benear	420 Montgomery st	Annual	Mar 24
Armand G & S M Co	California	J L Fields	240 Montgomery st	Annual	March 27
Atlanta M Co	Utah	E B Jago	420 Montgomery st	Annual	April 5
Buckeye G & S M Co	California	C A Sankey	331 Montgomery st	Annual	March 28
Equitable T & M Co		Charles J Collins	227 Montgomery st	Annual	Mar 21
Maryland Con G & S M Co	California	J T Gayson	419 California st	Special	March 22
Melones Con M Co	California	A Noel	419 California st	Annual	March 25
South End M Co	Nevada	R N Van Brunt	318 Pine st	Annual	March 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Feb 20
Indian Queen M & M Co	California	A K Durbrow	69 Nevada Block	25	Dec 17
Standard G M Co	California	W Willis	309 Montgomory st	1 00	Mar 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Mar. 6.

155 Alta....5¼@5¼
80 Alpha....17¼@18
290 Andes....45@50c
165 Best & Belcher..18½@18¾
700 Bullion....5⅝
1290 Belcher....6⅝@6½
320 Benton....4.10@4¼
475 Caledonia....2¾@2.70
1660 Con Imperial....1@1.05
160 Chollar....39½
250 C Dorado....10c
185 California....5⅝
275 Challenge....2¼@2.65
235 Con Virginia....5⅝
180 Confidence....13¼
450 Crown Point....4¾@4.80
175 Dardanelles....2
455 Exchequer....4.80@5
250 Flowery....80@85c
635 Gould & Curry....9⅝@9½
405 Hale & Nor....14½@14¼
240 Justice....4.05
1035 Julia....4.60@4.70
505 Lady Wash....1@1.20
460 L Bryan....1¼@1.20
430 Mexican....38@38½
170 Mackey....3.65@3.70
125 Morning Star....3
100 New York....50c
460 N Con Virginia..11¼@11½
740 N Bonanza....1.65@1.60
330 Ophir....36@36¼
90 Overman....11⅝@11½
590 Phil Sheridan....30@25c
195 Sierra Nevada....45½@46¾
215 Savage....11⅛@11½
390 Silver Hill....2.05
500 Succor....50@45c
600 Solid Silver....50c
100 Trojan....25c
130 Utah....14
285 Union Con....69@68
400 Wells-Fargo....15c
635 Ward....1.20@1¼
635 Yellow Jacket....17@17¼

AFTERNOON SESSION.

2025 Argenta....1
400 Belmont....45@50c
100 Belvidere....65c
495 Bodie....6@6½
245 Bulwer....17¼@17½
100 Black Hawk....1.65
225 Bechtel....60c
100 Belle Isle....30c
360 Booker....55@60c
400 Chieftain....25c
50 C Pacific....1¾
450 Champion....20@15c
695 Dudley....75@85c
120 Eureka Con....28
300 Esmeralda....1
100 Endowment....5c
120 Grand Prize....4.70@4¾
500 Goodshaw....45@50c
200 Golden Terra....9½@9⅝
200 Hussey....15c
600 Highbridge....65c
650 Hillside....2½@2.60
645 Independence...1¼@1.40
250 Jefferson....85c
100 Modoc....10c
1000 Martin White....6¾
70 Mono....2½
310 Manhattan....1½
250 Minnietta Bell....20c
50 Northern Belle....9⅝
745 Navajo....10@15c
220 Paradise....1.60@1.80
685 Raymond & Ely....6¾@7
460 Summit....2¼@2.35
400 Star....60@65c
170 S Bodie....30c
1400 S Bulwer....75@80c
140 Tiptop....60@70c
400 Tioga Con....1.40@1½
25 Tuscarora....10c

Thursd'y A. M., Mar. 13.

75 Alta....5¼
400 Andes....50@45c
140 Alpha....19¾@19½
1195 Belcher....9@8⅞
660 Bullion....5⅞
28 Benton....3¾
800 Brilliant....75c
430 California....6@5⅞
460 Con Virginia....5½
1715 Crown Point....6¼@6
70 Chollar....45@44½
1650 Con Imperial..1.40@1.35
330 Confidence....15½@15
270 Caledonia....3@2.95
590 Challenge....3¼@3.35
1400 Dardenelles....1¼@1.15
1915 Exchequer....5½@5¼
250 Flowery....85@75c
199 Gould & Curry...10⅝@10¼
150 Hale & Nor....16½
205 Justice....4.20@4.10
565 Julia....5⅝
70 Kentuck....5⅝@5¼
30 Lady Wash....1.10
510 Lady Bryan....1.10
515 Leviathan....35@30c
225 Mexican....39¾
150 Mackey....3.85@3.80
200 New York....40c
225 North Con Vir....11¼@11
285 N Bonanza....1.70
500 N Sierra Nevada....5c
266 Ophir....35¼@34¾
250 Overman....12¾@12¾
100 Phil Sheridan....35c
30 Seg Belcher....27@25
125 Sierra Nevada....47@46½
70 Savage....13½
255 Succor....45@40c
405 Silver Hill....2.05@1.90
50 Scorpion....1½
400 Solid Silver....45c
80 S Potosi....2.05
500 Trojan....20c
60 Union Con....73½
70 Utah....18@17¾
200 Wells-Fargo....15c
200 Ward....1.65@1.60
230 Yellow Jacket....20@19½

AFTERNOON SESSION.

1325 Argenta....1.35@1.40
300 Belle Isle....30c
100 Bulwer....16¼@16⅝
125 Bodie....5½@6
1525 Bechtel....1.30@1.40
2775 Belmont....75@85c
225 Belvidere....50@60c
520 Black Hawk...2.60@2.70
770 Booker....80@75c
140 C Pacific....1¾@1.90
200 Caledonia (B H)....1.90
200 Defiance....90c
450 Dudley....75c
195 Eureka Con....26¼@26
100 Goodshaw....50c
225 Grand Prize....4.60
260 Giant & O A....4¾@5
50 Gila....30c
400 Hamburg....50@60c
635 Highbridge....60c
50 Independence....1.70
50 Jackson....7½
230 Leopard....85c
100 Leeds....70c
15 Martin White....6⅝
665 Mono....2.40@2½
255 Manhattan....1⅝@2
950 McClinton....70@75c
240 Northern Belle...10⅝@11
50 Oriental....5c
350 Paradise....1.60
400 Richer....70@75c
120 Raymond & Ely....6¾
150 Silver King....8¾
1750 S Bulwer....80@90c
1010 S Bodie....25@35c
400 Star....50@55c
50 Summit....2.40
6325 Tuscarora....5@10c
450 Tioga Con....1¾
100 Tiptop....65c

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 12.

100 Alpha....18¾@18⅝
30 Alta....5.35
190 Belcher....7.95@7.90
20 Benton....4½
30 Black Hawk....2¼
100 Best & Belcher...19⅝@19½
30 Con Virginia....5⅝
375 Con Imperial....1.15
150 Crown Point....5⅝
70 Caledonia....3.05
75 California....5⅝@5⅝
20 Challenge....3 10
20 Chollar....43
160 Exchequer....5@5½
10 Gould & Curry....10⅝
150 Hale & Nor....16¾@16⅝
200 Justice....4.20
350 Julia....5⅝@5.60
120 Mexican....39½@40
150 Ophir....35½@35⅝
10 Overman....12
50 Phil Sheridan....30c
100 Savage....13¾
40 Sierra Nevada....46⅝
70 Silver Hill....1.95
60 Utah....18
10 Union Con....73½
130 Ward....1.65
40 Yellow Jacket...19½@19⅝

AFTERNOON SESSION.

20 Andes....40c
200 Argenta....1¼@1½
50 Belcher....8¼
50 Bullion....5⅝
100 Booker....85c
60 Black Hawk....2.60@2½
40 Benton....4½@4
55 Caledonia....3¼@3.05
310 Con Imperial....1¼
50 Con Virginia....5⅝
10 Crown Point....5.90
200 Endowment....5c
25 Hale & Nor....16¼@16½
180 Julia....5.65
300 Mariposa....4½@4
50 Mackey....3.85
180 Niagara....2@1.95
150 New York....40c
50 Ophir....35⅝@35½
100 Phil Sheridan....35c
50 Savage....13¾
40 Silver Hill....1.95
200 Trojan....20@23c
750 Tuscarora....5c
320 Ward....1⅝@1.70
100 Wells-Fargo....15c
40 Yellow Jacket....19⅝

California Board—Latest Sales.

Wed'sday A.M., Mar. 12.

50 Alpha....18@16½
1000 Atlanta....5@4c
40 Alta....5¼@5⅛
650 Ætna....17c
50 Black Hawk....2.40
125 Belmont....80c
250 Brilliant....75@45c
40 Best & Belcher...20¼@20½
60 Belcher....7¾@7¾
30 Bullion....5¼
50 California....5⅝@6
45 Con Virginia....5¼@5½
220 Con Imperial..1.15@1.17½
40 Crown Point....5½
30 Chollar....42½
130 Challenge....3¼
40 Exchequer....5½
250 Favorite....55c
100 Globe....4c
40 Gould & Curry...10⅝@10⅞
40 Hale & Norcross....17
80 Justice....4¼@4.20
30 Julia....5⅝
40 Mexican....40½
1000 Monumental....4c
100 Mint....17c
400 N Sierra Nevada....6c
1000 N Monumental....6c
30 Ophir....30½
100 Succor....25c
100 S Utah....12c
70 Savage....14@14¼
10 Sierra Nevada....46¼
200 S Europa....50c
60 Silver Jacket....95c
300 Trojan....20@21c
1000 U Flag....1c
50 Union....73@73½
40 Yellow Jacket..19⅝@19½

Mining Share Market.

The past week has been peculiarly trying on the nerves of our stock people. Not that the unfavorable fluctuations have been so large, but the market has been so changeable, so fitful, that it has either led operators astray or left them in painful uncertainty as to what it would do next. There have, in fact, been several "breezes" during the week, but as nothing could be discovered to justify them, they fell almost as quickly as they rose. The weakness which characterized last week's proceedings was present at the opening of this, and the same slow, steady decline was plainly perceptible. A gentle upward push was given generally along the line on Monday. There was no regularity in the advance, but the general tendency was upward. The cause of it can only be conjectured. It is supposed to have been due to rumors of further negotiations between Mr. Sutro and the Comstock managers. The water stocks were strong at an advance in this "bullish" appearance, Union being the feature at the north end. On Tuesday the bruces were suddenly taken out and the propped market immediately fell, a general decline characterizing the day from opening to close. Toward the end of the week there was again a slight improvement, though, as heretofore, what caused the appreciation was kept in the background. At the finish, while there was depression in the prices of some securities, and all transactions were limited, there was an affecting rise in others, and the market closed with a quiet steadiness.

Additional Rights to Homestead Settlers.

Following is the full text of the act granting additional rights to homestead settlers on public lands within railroad limits, approved March 3d, just before the adjournment of the last Congress:

"*Be it enacted, etc.*, That from and after the passage of this act, the even sections within the limits of any grant of public lands to any railroad company, or to any State in aid of any railroad or military road, shall be open to settlers under the Homestead laws, to the extent of 160 acres to each settler; and any person who has, under existing laws, taken a homestead on any even section within the limits of any railroad or military road land grant, and who, by existing laws, shall have been restricted to 80 acres, may enter, under the Homestead laws, an additional 80 acres adjoining the land embraced in his original entry, if such additional land he subject to entry; or if such person so elect, he may surrender his entry to the United States for cancellation, and thereupon he entitled to enter lands under the Homestead laws the same as if the surrendered entry had not been made; and the person so making an additional entry of 80 acres, or a new entry after surrender and cancellation of his original entry, shall be permitted so to do without payment of fees and commissions; and the residence and cultivation of such person upon and of the land embraced in his original entry shall he considered residence and cultivation for the same length of time upon and of the land embraced in his additional or new entry, and shall be deducted from the five years residence and cultivation required by law: Provided, that in no case shall a patent issue upon an additional or new homestead entry under this act until the person has actually and in conformity with the Homestead laws, occupied, resided upon and cultivated the land embraced thereon at least one year.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments: Hillside, March 5th, $5,220; Tyho Con., March 1st, $4,119.89; Tyho Con., March 5th, $3,975.29; Standard, March 8th, $19,529.91; Northern Belle, March 5th, $6,196.99; Paradise Valley, March 9th, $2,843.25; Grand Prize, March 10th, $12,500; Hillside, March 11th, $4,740; Christy Con., March 11th, $5,463.

THE name of Rev. H. W. Reed has been stricken from the roll of the Baptist Minister's Meeting of San Francisco, for misrepresentations at the East regarding the Chinese question.

THE Central Pacific Railroad Company are doing a good business despite the dull times. The earnings for February came up to $1,093,000—a gain of $112,500.

THERE are said to be an average of 50 applicants for each of the subordinate vacant offices in the new Congress, and members are nearly distracted.

ARRANGEMENTS have been made for commencing work on the Canada Pacific railroad at an early date.

IT is stated that the position of director of the geological surveys will be given to Clarence King.

THE New York Bullion Club talk of building an edifice to cost $1,000,000.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MOORE.—*Ledger*, Mar. 8: The first clean-up at this mine was made this week. Including sulphurets it will average about $50 per ton.

VOLCANO DISTRICT ITEMS.—A clean-up of a crushing of 140 tons of ore from the Downs mine yielded $7,000. At the mine the indications are that there is more runs of satisfactory character in store. There is a ledge seven ft in width, all of high-grade ore; in fact it is probably the richest body of quartz in the county. The quartz is of a whitish character. The mine and mill give steady employment to 25 men. The survey has just been made of a road, 114 rods in length, at Cape Cruce gulch, between the mine and mill. A Santa Cruz company has located 40 acres of gravel mining ground, one and a half miles north of Volcano. The ground is supposed to be rich, but great difficulty has been experienced in getting rid of the water. The present company propose to put up an engine, sink a shaft and prospect in a thorough style. The Grass Valley gravel claim is in full blast, and the owners are sanguine of its success. The Volcano tunnel is in 1,300 ft, with over 900 ft still to be bored.

OTHER NOTES.—The Hercules is progressing finely; shaft down 100 ft. At the bottom a tunnel runs north along the vein 70 ft. It is now decided to put down the shaft 200 ft deeper. An improved method of hoisting rock at this mine consists of a self-dumping car. It needs no bucket-lander, and this effects a considerable saving. The Centennial mill is shortly to be started on ore from the Victoria. Fifteen tons are on the dump, estimated to yield $12 per ton. The Fort John mine is developing slowly. Work is let by contract, and only two men are employed. These parties claim the ground, and the prospect is fair for considerable litigation before the question of ownership is settled.

CALAVERAS.

BANNER MINE.—Cor. *Chronicle*, Mar. 8: The shaft has been sunk to 200 ft, bringing to light a well-developed vein, rich in precious metal. Its engine are 35 horse-power, and it employs 20 men.

SAN PEDRO.—This mine has attained a depth of 150 ft, with fine, regular walls from six to eight ft apart, encasing a true fissure vein.

HOEY & SLITER.—*Chronicle*, Mar. 8: Work was resumed in the Hoey & Sliter mine on the 3d inst., operations so far being confined to getting things in readiness for taking the water out. A San Francisco company has bonded the mine for 60 days, with the privilege of purchasing at the end of that time or abandoning it as they see fit.

MAMMOTH.—A clean-up has recently been made at the Mammoth hydraulic (J. C. Veith proprietor) that would be considered phenomenal if the claim was located anywhere else but here. It was large enough to permit the declaration of a dividend of about $4,000 per share. That, for a short run, is one of the best yields ever heard of. The Mammoth stands at the head of hydraulics in the middle and southern mines.

FRESNO.

FINE GOLD.—Cor. *Republican*, Mar. 5: Work in the Fresno Gold mining company's mines is in full blast. The works were started up on the 24th of February. Twenty men are now employed and a larger force will be put on as soon as the necessary arrangements can be made to work to advantage. Ore of a high grade is being taken out and the mine belonging to the company will be started up next week. Another five-stamp battery will soon be added.

LOS ANGELES.

SILVERADO.—Cor. Anaheim *Gazette*, Mar. 8: But little work has been done at any of the mines. The Blue Light company prosecuted work upon two tunnels, with six men employed, until about the 1st of February, when all work was suspended. This company is endeavoring to consummate arrangements with San Francisco parties for the erection of reduction works, two experts in the interest of those parties having visited and inspected the mine during the past month. Morgan & Mills have continued work during the entire winter on the Mountain Lode, and are sanguine of having developed a good paying ledge carrying both silver and gold. The mill enterprise of Capt. John L. Bray, of San Francisco, has not been consummated according to the original contract, which called for the completion of a 10-stamp mill on or before March 1st. The failure is reported to be caused by the illness of Capt. Bray and the death of his partner. Advices from Capt. Bray state that he now has arrangements completed for the fulfillment of the contract, with an extension of time. Sixty days further time is asked, which the interested parties will no doubt grant.

INYO.

GOOD PROPERTIES.—*Independent*, Mar. 1: Mining progress just now in and around Cerro Gordo is by no means slow. The Ygnacio is still yielding plenty of rich ore. The Diaz brothers are opening the San Lucas, in a four-ft ledge of splendid milling ore, sufficient to constantly supply a 10-stamp mill. The Palma mine, owned by Messrs. Hughes & Diaz, is producing fine ore and free gold. At the dump of the Guymas mine, being developed by Antoine Moreno, there is 60 tons of high-grade galena, and the property bids fair to equal the Union in value. The gold ledges of Beveridge district, since having been opened during the winter to the depth of 100 ft, show stronger and richer ore bodies at the bottom.

UNION CON.—Lately good miners have been in demand at Cerro Gordo. Since the visit of Messrs. Belshaw & Beaudry, some two or three weeks ago, work has been pushed ahead in all matters with increased vigor. New drifts have been started, and all of them look well. The water-works, after lying idle all winter, during which snow was used instead, were started up the 23d ult. The lower furnace is to be fired up again soon for a long run.

MONO.

RED CLOUD CON.—Bodie *Standard*, Mar. 10: On the 400 level the Red Cloud ledge has been cut at a point 155 ft from the shaft. The ledge is about three ft wide, and contains the same blue rock which characterized it in the levels above. Drifts have been started north and south on the ledge. The west crosscut, same level, is now in 94 ft. The blue rock in this crosscut has given way to the reddish-brown porphyry, characteristic of the 250 level, and in which the best mines of the district have been found. The indications now are that the country is pitching to the east, while it seemed to be pitching west on the 250 level. On the 250 level the winze on the Packard and Morton ledge was stopped at a depth of 25 ft, in consequence of the accumulation of water, of which there is considerable in this ledge. All down the winze the same fine prospects in coarse gold could be obtained which were found when the ledge was first cut. The west crosscut, from the north drift of the same level, has cut through two ft of clay, and appears to be in the casing of the ledge.

BLACKHAWK.—The Warren vein, which was struck last week on the 220 level, new shaft, has been developed to a distance of 12 ft south from the crosscut, showing a fine four-ft ledge of valuable gold-bearing quartz. A north drift has also been started, which shows the vein in that direction to as good advantage as in the south. The crosscut is being advanced west for the second ledge, in exceedingly hard porphyry. Work has been retarded by visitors. The second ledge will be struck in a few days. The shaft is now down 805 ft. At 320 ft another level will be started, and a crosscut run for the ledge again.

STANDARD.—No change in the east crosscut from the main shaft; total length, 328 ft; progress for the week, 28 ft. The south drift from the crosscut has been advanced during the week 22 ft. The ledge is four ft wide, and looks well. The north drift from the east crosscut, 500 level, has been run 14 ft; total length, 90 ft. The ledge here is two ft wide of very good ore. North drift on West Standard is in 100 ft from west crosscut. The ledge is 18 inches wide of very rich ore. Connection has been made between the West Standard south drift and the drift coming from the south line. The ledges have come together. The north drift on the Cook ledge is in 150 ft from the southern boundary. The ledge is 18 inches wide, of very fine ore.

CON. PACIFIC.—The winze being sunk on ledge No. 2, 65 ft from the mouth of the tunnel, is down 57 ft. The ledge has pitched eastward so as to constitute the hanging wall of the winze, and is over 20 inches in width of an improved grade of ore. Progress will be more speedy hereafter, as three shifts of men will be employed. Work on the new central shaft, 550 ft south of the winze, was resumed on Saturday with increased force, and will be continued as a double-compartment and timbered with square sets. It is now 172 ft in depth, with indications of a favorable formation for crosscutting.

MARYLAND CON.—Work upon this mine is being pushed as rapidly as possible by the company. Their shaft is now in red porphyry and a ledge of considerable size of decomposed quartz. A crosscut will shortly be started for the Bonanza ledge, as there is no better showing in the camp.

AN IMPORTANT WORK.—The north drift from the Mono shaft, 400 level, has reached the Bodie line, 125 ft north of the Mono hoisting works. A crosscut will at once be run east and west the entire width of the two mines, 600 ft, and a station for a turn-table, etc., is now being cut out at the boundary line. This work is one of great importance. The 400 level of the Mono is equivalent to the 500 level of the Bodie new shaft. The proposed crosscut will be very likely to demonstrate what there is in the south end of the Bodie mine, as well as the value of the Mono.

NEVADA.

THE HUDSON MINE.—*Herald*, Mar. 9: The shaft is down 155 ft, and the ledge keeps improving in thickness, quality of rock, and is becoming better defined. At the bottom of the shaft the ledge is five feet thick. The stoping thus far has been done on the south side toward Deer creek. The mine was bonded some time ago, and the parties bonding will, without doubt, effect a sale to an Eastern company. A new road has been graded from the Pleasant valley road along the brow of the Beckman hill down to the mine.

BLOOMFIELD MINE.—The company are now washing through shaft No. 0, which is the uprise at the end of the main tunnel. They will still use shaft No. 8, which has been the inlet into the branch tunnel heretofore in use, in case of stoppage of operations in shaft No. 9, so that no time need be lost.

PROVIDENCE MINE.—The uprise for the new shaft, at the Providence mine, has been completed. The shaft was started from the 000 level, and from the starting point to the place where it comes to the surface on the side of the hill is nearly 800 ft. Some very rich rock was cut through in making the uprise. The new shaft gives a splendid chance for air. The air now is just as pure as at the surface.

SNEATH & CLAY MINE.—This mine has been recently purchased by Messrs. Shoecraft & Sprague. It is proposed to incorporate it and sell the stock here. The stock of the company is divided into 100,000 shares at a par value of $10 per share. The property consists of 1,100 ft of gold-bearing quartz. There is a 12-stamp mill on the mine, with hoisting works, and these are supplied with three engines and two boilers. Besides there are sheds and other necessary buildings. It will cost about $1,500 to start everything in working shape. The incline is down 470 ft, with four levels which have been run, and from which over $400,000 were taken out; the company will incorporate as soon as 40,000 shares of the capital stock has been subscribed. The mine is at present in the hands of mining engineer, Fred. A. Sacket, Esq., who is receiving subscriptions for the stock.

THE DEADWOOD MINE.—*Transcript*, Mar. 7: The average amount of ore now being extracted is 15 tons to every 24 hours. A crushing of 185 tons has just been made, and there is besides 200 tons more on the dump. Workmen are engaged in attaching pipes so that in a few days the mill and hoisting works will be run by hurdy-gurdy power at an expense not exceeding $4 or $5 per day.

THE SMITH MINE.—The north drift is now in over 50 ft. The last 12 ft of it has been in solid boulders, but there is a good prospect for shortly being in soft granite again. The drift extends along a small ledge that increases in size and quality as it is developed. It is expected that 150 ft more will reach the rich chute that was formerly worked down on 80 ft and paid over $100 per ton. The chute is supposed to be at least 200 ft long.

PLACER.

THE KEEHNER & HOLER QUARTZ MINE.—*Herald*, Mar. 8: Messrs. Keehner & Holer are now sinking a shaft on the old New York ledge, on the old Poland ranch. The shaft is now down 38 ft. They have raised 26 tons, which milled at the rate of $13 per ton. This enterprise shows that there is an abundance of quartz in and around Duncan hill which may be made remunerative by the application of individual industry.

THE BOOTH QUARTZ MINE.—This mine is now leased to Messrs. Robinson, Ferguson and Gould Bros. The shaft is down 175 ft. The hoisting works, which are operated by a whim and horse-power, are in fine working order. The rock pays from $8 to $10 per ton. The ledge is from two to five ft in width. The indications now are that the company is raising excellent milling rock, to be crushed in Messrs. Simons & Palster's quartz mill on North Ravine. The Booth mine failed to be remunerative in the hands of a stock company some years since, but under the control of practical miners its bids fair to become valuable property.

IOWA HILL ITEMS.—J. B. Hobson's claim, at Independence hill, had run seven days when it was compelled to shut down for want of water. The Orion mine is owned by capitalists of Springfield, Mass., and San Francisco. The superintendent is W. W. Anderson, of Gold Run, an experienced and thorough miner. Night and day shifts of men are working on the rimrock and into the Sugar Loaf. They are at present using about 625 inches of water, and expect to have as much more for use. At the Morning Star nothing can be done until they have a supply of water in the big ditch. Watts Bros. have a small claim on Strawberry Flat in which washing is going on, the water supply coming from Indian canyon. The men have some heavy rock to work and found it necessary, on this account, to put up a powerful derrick last fall. The mast is 60 ft high and the boom 50 ft in length. Entwistle's claim is running with 250 inches of water. Joseph Byrne and David Beardsley are about to work a 10-stamp mill on the Columbus mine on Roach hill. John Mills has a small hydraulic mine which will pay well this season if he gets the necessary water. Anton Phillips, a Portuguese, has a hydraulic claim here that has always paid well when the water season permitted of its being worked. The owner generally has two or three men besides himself to operate ft. The mine has not been worked this season.

SHASTA.

WHISKYTOWN.—Cor. Reading *Independent*, Mar. 6: Knox, Woodward & Co. have run a tunnel on their lead about 100 ft. Although they have run through some very inferior rock, they have now reached a place where it prospects very rich indeed. They have quite an amount of quartz on hand and are running the arastra as fast as the water will permit. A clean-up of some of the quartz taken out last summer yielded about $60 per ton. Mr. Banghart's mine, same diggings, on Mad Mule, is yielding very rich. We have just seen weighed over 40 ounces of pure gold, which he lately took out in one day. He has run a tunnel into the hill several hundred ft. He expects to reach a very rich point soon, at which he sank a shaft last summer, but owing to the water, could not sink it further. The Morning Light, a new mine recently discovered at the head of Murderer's gulch, about one mile west of Whiskytown, is prospecting well. A tunnel is being run and it is expected that the ledge will be reached within a few days. At the Peckham mine, now owned by Stroud & Co., the work is being pushed quite rapidly. The mill has been received on the ground and will be in operation within a few weeks. Work on the extension is being rapidly pushed forward. Their arastra runs night and day, but on account of scarcity of water, can do but little more than half work. Williams & Ketchum are working their claim on Saw Mill flat. They have an abundance of water and are receiving good returns.

TUOLUMNE.

A NEW INTEREST.—*Union-Democrat*, Mar. 8: The Seeber claim, a short distance below town, begins to assume an appearance of business. The shaft has already been sunk to a depth of 40 ft. The vein is about 18 inches wide. The rock taken out looks well, and the parties at work represent that it prospects encouragingly. The intention is to sink to a depth of about 50 ft, and then to start a drift. The bottom of the shaft is now several ft below the bed of Woods creek, and water begins to retard the work. The present outlook of the mine is promising, and it is to be hoped that it will prove a success.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—Gold Hill *News*, Mar. 12: The drift, 1650 level, connecting the C & C shaft and the Con. Virginia shaft, is receiving needed repairs. The joint Con. Virginia winze from the 1950 level is down 67 ft, and still in hard blasting porphyry. The joint drift on the 2150 level continues to make rapid progress in hard blasting porphyry. The C & C shaft is cutting dry, hard rock, and nearing the 2300 level. The daily yield of this mine is about 240 tons.

MEXICAN.—A joint Ophir upraise has been started from the 2100 level of the Ophir to meet the drift running north on the 2000 level for ventilation. The joint Union Con. incline winze is now 278 ft on the slope below the 1600 level, and in hard blasting porphyry. The north drift, 2000 level, continues in soft porphyry, through which it is making seven ft per day.

OPHIR.—Repairs to the main shaft, above the 1465 level, have been continued. Work in the incline has been resumed. From the main north drift, 2100 level, a joint Mexican upraise has been started for the 2000 level for ventilation.

SAVAGE.—The pumps are holding the water at the 2040 tank. Repairs to the vertical shaft and incline continues.

EXCHEQUER.—North drift, 2400 level, is in soft ground, requiring to be timbered. The vein widens as this drift is pushed on north.

CON. VIRGINIA.—Repairs to the shaft below the 1400 level have been rendered necessary by its gradual sliding to the east so as to interfere with the running of the cages. Repairs to the 1050 connecting drift are being made. The joint California winze is making two ft per day through hard porphyry. Three ft per day are being made in the joint drift 2150 level to connect with the joint winze, the material encountered being porphyry.

SIERRA NEVADA.—The sump at the bottom of the east shaft has been completed and a drift started on the 2200 level in that coming north from the incline. It is now 60 ft below the 2300 level. The north drift, 2200 level, is still in soft ground, the face 390 ft from the north crosscut. Good progress is being made in the upraise from the 1700 level to connect with the North Con. Virginia shaft.

GOULD & CURRY.—Repairs last week stopped developments, but work is now making usual progress. The winze on the Savage line is being sunk from the 1900 level to the 2000 level, and crosscuts east are being run joint with the Best & Belcher on both the 1700 and 1900 levels. The Osbiston shaft is still encountering a heavy flow of water, the pumps raising 30 miners' inches.

NORTH BONANZA AND FLOWERY.—The water tank at the 300 level of the joint shaft is ready to talk and the rock chute is completed. An engine of sufficient capacity to sink 2,000 ft was bought yesterday, and will soon be placed in position. The north drift is following the ledge at the rate of six ft per day. There is no water there to hinder operations.

BELCHER.—The main incline is now 125 ft below the 2560 level. The south drift on the 2560 level is averaging seven ft per day.

UTAH.—Repairs to the incline during the past week have somewhat delayed operations at other points. A water tank has been put in near the bottom of the incline, so as to be in readiness when the standing pumps are in place.

OVERMAN.—The winze from the 1600 level is still in porphyry containing streaks of quartz, which are increasing in size with depth. The north drift, 1000 level, is in soft vein matter from which some water seeps in. The O & C shaft is down 470 ft in good working ground.

YELLOW JACKET.—Put in the new air-compressor. The engine of the compressor is now on its bed. The work of putting in the air pipes is progressing well.

HALE & NORCROSS.—The winze from the east drift, 2000 level, is nearing the 2100 level. The pumps are all holding the water below the 2000 level.

CROWN POINT.—The north drift, 2500 level, is still skirting the ore vein, laying it bare ready for crosscutting.

BULLION.—An airway is being cut in the crosscut, 1840 level, for better ventilation. The formation encountered is still porphyry and quartz. The foundation stones for the new air compressor are being laid, and the shaft is undergoing repairs at the 500 station.

BEST & BELCHER.—The general overhauling at the Gould & Curry last week interfered with work in the mine somewhat, but operations are now going on as usual. A joint drift is being run with Con. Virginia west on the 1700 level and joint crosscuts east with the Gould & Curry on both the 1700 and 1900 levels.

JULIA CON.—Pumping to the surface and into the Sutro Tunnel. The sprung and twisted reel shaft has been replaced by a new one. The bailing tanks have been taken out of the shaft. There has been a good down current of air again given to the north compartment of the shaft. The 2000 level has not yet been freed from water.

MT. HOOD & VANCOUVER.—Last evening the 1400 level of the Mint shaft was drained and the water was taken from the sump 25 ft below that level.

WARD.—Work in the east crosscut, 800 level, will be resumed the last of this week. The men are digging the trench for the water pipe from the tank to the works. The new engine will start as soon as the new skeet is ready for use.

NORTH CON. VIRGINIA.—The shaft is still encountering the hardest kind of rock, but making three ft per day. It will connect with the upraise from the 1700 level of the Sierra Nevada in about 10 days.

UNION CON.—The work of enlarging and retimbering the north drift, 1450 level, connecting with the Sierra Nevada, continues. The joint Mexican winze from the 1000 level is down 278 st on the slope, in hard blasting porphyry.

CHOLLAR-COMBINATION SHAFT.—The work of putting in the 6-inch pipe for the air compressor has been completed, and the compressor itself is being put in place as fast as possible.

JUSTICE.—At the old Waller Defeat ground, three shifts of seven men each are employed extracting ore which is being worked at the Pappoose mill. The capacity of this mill is 20 tons per day, and it is kept running.

CON. IMPERIAL.—South drift, 2200 level, to connect with the old workings of the Yellow Jacket, is in 50 ft, and in fine looking quartz.

LADY BRYAN.—Sinking below the 600 level as usual. The drifts north and south on this level are still being driven ahead and making good progress. The one to the south is in very fine looking quartz, but of low grade. The one north is outside the quartz formation, but is still in the vein.

LEVIATHAN.—The face of the north lateral drift on the

[Continued on Page 172.]

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 20.		Week Ending Feb. 27.		Week Ending Mar. 6.		Week Ending Mar. 13.	
Alpha	21	15¾	21	18½	20	17¼	19¾	18
Alta	7⅛	7	6⅞	5½	5⅝	5	5⅛	5
Andes	50c	65c	60c	50c	50c	45c	50c	40c
Alps	....	....	....	....	....	....	....	....
Argenta	65c	60c	1	90c	1.40	1	1.35	1.10
Atlantic	....	....	....	....	....	....	..	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1	....	1¼	1	....	....	....	....
Belcher	8⅞	7½	7¼	6¼	6⅞	6	9	6⅜
Belmont	55c	50c	50c	40c	50c	45c	1	40c
Best & Belcher	25½	24	24	24½	20	17¾	19½	17⅞
Bullion	8⅜	7½	7⅞	6⅜	6¼	4	6	5¼
Bechtel	70c	55c	75c	50c	85c	50c	75c	60c
Belle Isle	30c	....	30c	....	35c	30c	35c	30c
Bodie	7½	2½	7⅜	6¾	7	6	6⅛	5⅛
Benton	5¾	5	5	4.40	4½	3.90	4.20	3¾
Bulwer	18	16½	20	18	19½	17¼	18	15
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.05	65c	1.40	85c	2	1.40	2⅜	1.60
Belvidere	1.40	80c	60c	40c	85c	50c	65c	60c
Booker	45c	55c	50c	40c	1	40c	1	60c
Caledonia	3.10	2.90	2¾	2.55	3¾	2	3.20	2.70
California	7⅞	7⅝	7⅞	5⅞	6⅞	5⅝	6	5⅜
Challenge	3.95	3	3.70	3	3	2⅛	3½	2.65
Chollar-Potosi	49½	48	49	46	46	39½	45	39½
Comanche	....	....	....	....	....	....	....	....
Confidence	17½	15½	16½	14	14½	12½	15⅛	13
Con Imperial	1.35	1.05	1.30	1.15	1.15	1	1.40	1
Con Virginia	7½	7½	7½	5¾	6⅛	5¾	5⅜	5½
Crown Point	6½	6	5⅞	4¾	5½	4.40	6⅛	4.90
Con Washoe	....	....	....	....	....	....	....	....
Champion	....	....	10c	....	45c	25c	25c	20c
Concordia	....	....	....	....	25c	15c	....	....
Dayton	50c	....	....	....	50c	....	....	....
DeFrees	10c	....	10c	....	5c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	30c	....	30c	25c	35c	30c
Eureka Con	30	29¾	29	27½	29	27½	28	27½
Exchequer	7	6	7½	5⅛	5½	4.80	5½	4¾
Endowment	20	15	15c	5c	10c	5c	5c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	5¾	5	5	4.60	4.80	4½	5¼	4.55
Gila	5c	....	30c	5c	30c	25c	30c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	5½	10	9	10	9	58c	50c
Goodshaw	50c	45c	50c	....	60c	45c	55c	25c
Gould & Curry	14¾	13⅝	13⅜	11⅝	11¼	9¼	10⅝	9¼
Hale & Norcross	18⅜	17	17½	15⅞	16⅛	14½	17	14
Hillside	2¼	2	2.65	2.40	2.60	2¼	2.60	2½
Highbridge	1¼	1	80c	60c	75c	55c	60c	55c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	30c	25c	20c	....	15c	....
Independence	2	1.80	1.80	1¾	1.60	1.35	1.90	1.60
Julia	4.20	3.90	5¾	5⅛	5⅜	4.60	5¾	5½
Justice	5½	5⅛	5⅛	4	4½	4	4.30	4
Jackson	7¼	6	7¼	7	7½	7	8	7¾
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6¼	5¾	5⅞	4¾	5⅜	4½	5⅜	4¾
Kossuth	20c	15c	25c	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.90	1½	1.95	1¾	1.65	1	1.30	1.10
Lady Wash	1.90	1.60	1.70	1¼	1.45	1	1.20	1.10
Leopard	1	90c	85c	50c	85c	70c	80c	75c
Leviathan	65c	55c	65c	50c	50c	40c	35c	25c
Leeds	80c	75c	1	60c	1	70c	70c	....
Lee	....	....	....	....	....	....	....	....
May Belle	10c	....	....	....	....	....	25c	....
Modoc	....	....	10c	5c	10c	....	10c	....
Manhattan	3	2½	2.90	2½	2½	1½	1.60	1½
Martin White	5	....	6	5⅜	7	6	7	6⅜
McClinton	85c	40c	75c	60c	90c	75c	80c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	40¾	38½	47½	39½	43	37¾	41	36½
Mides	....	....	....	....	1½	....	....	....
Morning Star	....	....	....	....	3	....	....	....
North Con Virginia	11½	9	14¾	10	12½	10½	13	10½
New York	85c	60c	65c	45c	50c	30c	50c	25c
Northern Belle	10	9	10	8	9½	9	10½	9¾
New Coso	....	....	....	....	....	....	....	....
Navajo	25c	20c	20c	15c	20c	15c	30c	25c
Occidental	....	....	....	....	....	....	....	....
Ophir	42	39¼	43½	40	41¼	35½	37	34¾
Oriental	5c	....	20c	15c	15c	5c	10c	6c
Overman	12	11	10¾	9½	12⅜	10¾	12¾	11½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	2	....	....	....
Phil Sheridan	30c	25c	50c	40c	45c	25c	40c	35c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	6⅛	6¼	5	6	5	6¾	6
Richer	65c	....	1	....	1	75c	75c	65c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15⅜	14	13¾	13	13½	11⅞	14	11
Seg Belcher	25	24	27	....	....	....	27	25
Sierra Nevada	49	46½	57	47¾	48¾	45	47	44⅜
Silver Hill	2.70	2.40	2½	2	2¼	1.95	2.20	1.90
Silver King	9½	9¼	10	9⅛	8½	....	8½	8
Silver Prize	....	....	10c	....	....	....	....	....
Succor	1	65c	60c	45c	50c	30c	50c	40c
Summit	2.65	2.15	3¼	2.30	3	2.15	2½	2
Scorpion	1.60	1.40	1.70	1½	1½	1	1.60	1¼
Solid Silver	60c	55c	60c	55c	65c	40c	50c	40c
South Bodie	30c	....	30c	....	30c	....	30c	25c
South Standard	....	....	....	....	....	....	....	....
Star	75c	....	75c	70c	60c	....	60c	50c
St. Louis	....	....	50c	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1.70	1.40	1¾	1¼	1¾	1.40	1¾	1.55
Tiptop	1¼	90c	1	90c	90c	70c	65c	55c
Trojan	35c	25c	30c	25c	50c	25c	25c	20c
Union Con	68	61	90	67½	76	68	76½	66
Utah	18	16	20	16¼	17	13½	18	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1.20	2.05	1.35	1.55	1.20	1¾	1.40
Wells-Fargo	20c	15c	15c	....	20c	15c	15c	5c
Woodville	....	....	25c	....	25c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	22⅜	20½	22½	20	19	17	20	16⅜

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 7.

300 Andes....40c
220 Alta....5½@5
10 Alpha....18
140 Best & Belcher...18@17¾
750 Bullion....5¼
490 Belcher....6⅜@6½
290 Benton....4
1265 California....5⅜@5½
250 Crown Point...4.70@4.80
2605 Con Imperial....1.05@1
250 Caledonia....2.70
150 Confidence....13@13¼
115 Challenge....2¾@2.65
65 Chollar....39½@40
895 Con Virginia....5⅜@5¼
180 Dardanelles....2
215 Exchequer....4¾
600 Flowery....85@80c
755 Gould & Curry....9⅜@9¼
305 Hale & Nor....14
400 Justice....4.10@4
2280 Julia....5⅜@5⅜
30 Kentuck....4½
160 Lady Bryan....1.20
110 Lady Wash....1.10
700 Leviathan....30c
665 Mexican....36½@37½
200 North Con Vir...10½@10¾
990 N Bonanza....1½
360 New York....50@45c
90 Overman....11½@11⅝
500 Ophir....35@35½
330 Sierra Nevada....45@44¾
590 Savage....11@11⅛
100 S Potosi....2.05
940 Silver Hill....2.10@2
650 Solid Silver....50c
600 Succor....45c
245 Scorpion....1.40@1½
250 Trojan....25@20c
100 Utah....13¾@13½
135 Union Con....66@66½
100 Wells-Fargo....15c
1550 Ward....1½@1.40
430 Yellow Jacket....16⅜@16¼

AFTERNOON SESSION.

610 Argenta....1.15@1.10
400 Albion....40@35c
200 Belmont....45c
910 Bechtel....70@65c
65 Bodie....6@6½
100 Belvidere....60c
70 Bulwer....16¾
300 Black Hawk....1.65
100 Belle Isle....35c
100 Booker....70c
250 Champion....20c
120 C Pacific....1½
100 Caledonia (B H)....2.20
100 Chieftain....15c
100 Dudley....90c
100 Day....30c
40 Eureka Con....28
300 Esmeralda....1
50 Endowment....5c
125 Goodshaw....45c
160 Grand Prize....4.55
15 Golden Terra....9
100 Giant & O A....4½
100 Hillside....2½@2.60
450 Highbridge....60c
380 Independence...1.70@1¾
50 Jackson....8
270 McClinton....75@80c
100 M White....6¾
100 Minnietta Belle....25c
330 Mono....2¼
30 Manhattan....1⅛
400 Navajo....30c
600 Oriental....10c
450 Paradise....1⅞@1.80
10 Raymond & Ely....6¼
50 Real del Monte....2
1200 Star....50@60c
65 Silver King....8
100 S Bodie....25c
735 Summit....2½@2.40
750 S Bulwer....80@75c
175 Tiptop....55c
3005 Tuscarora....5@10c
150 Tioga Con....1.60

Saturday A. M., Mar. 8.

25 Alpha....18
270 Alta....5¼@5¼
45 Andes....40c
260 Argenta....1.15
110 Best & Belcher..18¾@18½
690 Belcher....6⅜@6½
925 Bullion....5¾@5½
340 Booker....60c
610 Bodie....6
370 Benton....4.20@4.05
330 Bulwer....15@15½
100 Belvidere....60c
150 Bechtel....60c
100 Belmont....40c
100 Belle Isle....35c
330 Black Hawk...1.60@1.70
300 Con Esmeralda....1
640 Con Virginia....5¾
460 California....5⅜@5½
140 Confidence....13¼
260 Chollar....40¼@41
240 Crown Point...4.80@4.90
2455 Con Imperial....1.05@1
100 Champion....25c
350 Challenge....2¾
520 Caledonia....2.80@2.90
80 C Pacific....1.70@1½
1400 Caledonia (B H)..2.10@2
365 Dardanelles....2.10
250 Dudley....90@85c
190 Exchequer....5
205 Eureka Con....27½@27¾
325 Flowery....80c
915 Gould & Curry....9⅜@9¾
80 Grand Prize....4.55
500 Goodshaw....25@40c
50 Golden Terra....50c
325 H & Norcross....14¾@14¾
500 Highbridge....60@55c
45 Hillside....2½
100 Independence....1.60
370 Justice....4.10@4.20
1175 Julia....5⅜@5¾
100 Jackson....8
5 Kentuck....5
100 Kossuth....15c
300 Leviathan....25c
860 L Bryan....1.20@1.30
50 Lady Wash....1.15
575 Mexican....40@39¼
200 Mackey....3.70
65 M White....7
50 Manhattan....1½
220 Mono....2.20@2.10
250 McClinton....75c
500 New York....25c
220 Navajo....25@30c
160 N Con Virginia...13@12¾
1325 N Bonanza....1½@1.40
500 Northern Belle....9¾
340 Ophir....36½@37
125 Overman....12@12¼
55 Phil Sheridan....35c
650 Paradise....1.80@2.85
525 Raymond & E....6¼@6
1056 Savage....11½@11⅝
850 Succor....50@45c
150 Sierra Nevada....46¾@47
280 Silver Hill....2.10
350 Solid Silver....50c
1660 Star....50c
750 Scorpion....1½
100 S Potosi....2.05
100 S Bulwer....75c
100 South Bodie....25c
450 Summit....2½
100 Silver King....8½
25 Tuscarora....10c
615 Tiptop....50@55c
150 Tioga....1.60@1½
440 Union Con....75@72
230 Utah....14@14½
1295 Ward....1.70@1¾
200 Wells-Fargo....15c
590 Yellow Jacket....17¼@17½

110 Best & Belcher....18¾
495 Belcher....7¾@7⅞
405 Bullion....5⅛@5¾
230 Benton....4@3.90
80 California....5¾
345 Caledonia....3@3.10
1195 Con Virginia....5⅜@5¼
5370 Con Imperial..1.05@1.10
60 Chollar....42
325 Crown Point....5½@5
30 Confidence....13¾
720 Challenge....3
1390 Dardanelles....1@1½
860 Exchequer....5
450 Flowery....75c
835 Gould & Curry....9⅞@10
190 H & Norcross....16¼@16½
260 Justice....4¼@4.20
715 Julia....5½@5⅜
125 Kentuck....5¼@5⅛
600 Lady Bryan....1½
100 Lady Wash....1.20
400 Leviathan....25@30c
565 Mexican....40½@41
150 Mackey....3.80@3.90
350 New York....40@50c
300 North Con Vir....11½@11
625 N Bonanza....1¾@1.80
155 Ophir....36½
20 Overman....12¼
400 Phil Sheridan....35@40c
100 S Potosi....2.05
565 Sierra Nevada....46@46½
440 Savage....13⅜@13¼
660 Silver Hill....2@2.05
700 Succor....45@40c
600 Solid Silver....45c
405 Scorpion....1½
300 Trojan....25@20c
205 Utah....18
400 Union Con....75@74
100 Wells-Fargo....5c
600 Ward....1.65
360 Yellow Jacket....18⅜@18¾

AFTERNOON SESSION.

100 Argenta....1¼@1.15
100 Albion....40c
920 Booker....80c@1
155 Bodie....5½@5½
250 Bechtel....70@65c
150 Belvidere....60@55c
245 Bulwer....17¾@18
850 Belmont....70@80c
665 Black Hawk....2¼@2½
50 C Pacific....1.70
200 Caledonia (B H)....2
200 Day....30c
900 Dudley....60@75c
70 Eureka Con....28
325 Giant & O A....4½
300 Goodshaw....55c
400 Grand Prize....5@5¼
200 Gila....30c
295 Hussey....15c
500 Hillside....2½
375 Hamburg....50@60c
500 Highbridge....60c
50 Independence....1.60
350 Jackson....8
1970 Leopard....75@80c
50 Minnietta Bell....25c
305 Mono....2¼@2.10
400 McClinton....75c
200 Modoc....10c
300 M White....6⅞
270 Northern Belle....9½@10
150 Navajo....25c
2000 Oriental....5c
185 Paradise....1.90@1¾
300 Raymond & Ely....6½
100 Richer....65c
200 Star....50c
100 S Bodie....30c
275 Silver King....8½
550 Summit....2@2.10
720 S Bulwer....75@80c
1025 Tuscarora....5@10c
100 Tiptop....65c
1125 Tioga Con....1.60@1¾
900 University....75@65c

Monday A. M., Mar. 10.

725 Alta....5¼@5½
120 Alpha....18@18½
130 Best & Belcher...19½@19⅝
280 Belcher....7⅞@7¾
640 Bullion....5⅞@6
510 Benton....4.15@4.05
25 Chollar....42
750 California....5¾@5⅝
350 Con Virginia....5⅜@5¼
190 Crown Point....5¼
390 Con Imperial....1.05@1
410 Challenge....3
540 Caledonia....3½@3.20
220 Confidence....14@14½
220 Dardanelles...2.15@2.20
360 Exchequer....5½@5⅜
1150 Flowery....80@85c
265 Gould & Curry...10¼@10½
200 Hale & Nor....16@15⅞
235 Justice....4½@4.30
435 Julia....5½@5⅜
105 Kentuck....5
80 Lady Bryan....1¼
885 Leviathan....25@30c
390 Mexican....40½@41
150 Mackey....3.80@3¾
240 North Con Vir...12¾@12¾
1440 N Bonanza....1.95@1.60
225 Ophir....37@36¾
160 Overman....12¼
200 Phil Sheridan....40@35c
500 Solid Silver....45c
200 Savage....13⅝
360 Sierra Nevada....46½@47
1020 Silver Hill....2.05@2.20
110 S Potosi....2.05
750 Succor....45c
40 Seg Belcher....25
375 Scorpion....1½@1.60
100 Trojan....25c
50 Utah....17½
370 Union Con....75@76½
755 Ward....1.65@1¾
625 Yellow Jacket....18@18⅜

AFTERNOON SESSION.

150 Albion....40c
375 Argenta....1.15@1½
800 Belmont....45@50c
200 Belle Isle....30c
385 Bodie....6
250 Bechtel....70@65c
1300 Booker....80@75c
300 Belvidere....60c
310 Bulwer....16@15½
1610 Black Hawk....2@2.15
1200 Caledonia (B H)...1.90@2
100 Con Pacific....1½
100 Day....30c
225 Dudley....80@75c
40 Eureka Con....27¾
75 Endowment....5c
685 Grand Prize....4.70@4.85
300 Gila....30c
420 Goodshaw....40@45c
40 Giant & O A....4½
5 Golden Terra....8
150 Hamburg....50c
60 Hillside....2½
840 Highbridge....60@55c
25 Independence....1.60
250 Jackson....8
745 Leopard....75@80c
180 Mono....2¼@2.20
450 McClinton....75c
50 May Belle....25c
420 Modoc....10c
50 Northern Belle....9¾@10
780 Navajo....25@30c
100 Oriental....5c
1005 Paradise....1.95@2
650 Raymond & Ely...6½@6⅞
200 Richer....70@75c
215 Standard....20
1000 Star....50c
120 S Bodie....25c
730 S Bulwer....75@80c
220 Summit....2.40
2025 Tuscarora....5@10c
425 Tioga Con....1.55@1.60
10 Tiptop....65c
400 University....75c

Tuesday A. M., Mar. 11.

130 Alta....5¼@5½
110 Alpha....18@18½
200 Andes....40c

70 Real Del Monte....2¼@2
300 Raymond & Ely...6⅜@6½
700 Richer....65c
500 S Bodie....30c
1030 Summit....2@2¼
950 S Bulwer....85@80c
85 Silver King....8¼
90 Standard....20c
800 Star....50c

Wed'sday A.M., Mar. 12.

315 Andes....50@40c
230 Alpha....19
290 Alta....5½@5⅝
100 B & Belcher....19¾@19½
575 Bullion....6
735 Belcher....7⅞@8
325 Benton....4@3.95
20 Chollar....43
530 Con Virginia....5⅜@5½
285 California....5¾
675 Crown Point....5½@5⅝
195 Caledonia....3
4115 Con Imperial..1.20@1.15
10 Confidence....14½
1120 Challenge....3@3.10
2250 Dardanelles....1@1¼
450 Exchequer....5⅜
200 Flowery....75@80c
365 Gould & Curry...10½@10⅝
730 Hale & Nor....17@16½
60 Justice....4½@4.20
540 Julia....5⅝@5⅝
50 Kossuth....15c
800 Leviathan....35@30c
100 Lady Bryan....1¼
170 Lady Wash....1.20
185 Mexican....40@39¾
100 Mackey....3.80
200 North Con Vir..11¾@11¾
255 New York....45@40c
350 N Bonanza....1.80@1.70
60 Overman....12¼
480 Ophir....35¾@35½
425 Phil Sheridan....35c
800 Succor....40c
260 Savage....14
190 S Nevada....46¾@46¼
400 Solid Silver....45@40c
370 Silver Hill....2@1.95
100 S Potosi....2.05
100 Trojan....20c
60 Utah....18@17¾
400 Union....73@74
1050 Wells-Fargo....10c
1570 Ward....1.65@1¾
330 Yellow Jacket...19½@19¼

AFTERNOON SESSION.

80 Albion....25c
825 Argenta....1.35@1¼
90 Bulwer....17½@16½
615 Bechtel....65@75c
270 Bodie....5⅞@6½
685 Black Hawk....2½@2⅝
3055 Belmont....80c@1
200 Belle Isle....30c
370 Booker....90@50c
100 Caledonia (B H)....1.95
550 C Pacific....1.70@1¾
650 Day....30@35c
120 Dudley....75c
30 Eureka Con....27¾
50 Esmeralda....90c
165 Grand Prize....4.90@5
525 Giant & O A....4¾@5
200 Hamburg....50c
600 Highbridge....60c
50 Hillside....2½
150 Hussey....15c
270 Independence....1.90
100 Jefferson....30c
90 Jackson....8@7¾
900 Leopard....75@80c
240 Leeds....70c
250 McClinton....70@60c
45 Manhattan....1.60@1½
40 M White....6⅞@6⅞
260 Mono....2¼@2.20
100 Modoc....10c
100 Northern Belle..10½@10⅞
450 Oriental....5c
430 Paradise....1.70

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCK ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	A.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery st
Bechtel Con M Co	California	1		Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3		Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
Caledonia S M Co	Nevada	26		Jan 31	Mar 7	Mar 28	W Wegener	414 California st
DeFrees M & M Co	Nevada	9		Mar 11	Apr 11	May 3	T E Atkinson	318 Pine st
Dudley M Co	California	2		Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3		Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Florence Blue Gravel M Co	California	3		Jan 22	Feb 25	Mar 15	F A McGee	Merchants Ex
Flowery M Co	Nevada	1		Jan 29	Mar 4	Mar 21	W W Stetson	309 Montgomery st
Gila S M Co	Nevada	3		Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Gould & Curry S M Co	Nevada	35	1	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Hussey Con G & S M Co	Nevada	7	5	Jan 20	Feb 26	Mar 21	R H Brown	327 Pine st
Julia Con M Co	Nevada	8	10	Jan 21	Feb 27	Mar 19	A Noel	419 California st
Leopard M Co	Nevada	9	[illegible]	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Leviathan M Co	Nevada	8		Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Manhattan S M Co	Nevada	2	1	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	10	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	[illegible]	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	[illegible]	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Navajo M Co	Nevada	5	[illegible]	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
Overman S M Co	Nevada	43	30	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Phil Sheridan G & S Co	Nevada	8	5	Jan 21	Feb 24	Mar 17	D L Thomas	203 Bush st
Resolute T & M Co	California	1	[illegible]	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	10	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	5	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
South Bulwer G M Co	California	2	[illegible]	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	5	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Yellow Jacket S M Co	Nevada	31	10	Jan 15	Feb 19	Mar 19	Mercer Otey	Gold Hill Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	A.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argent M Co	Nevada	4	0	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Aurora T & M Co	California	3	0	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Black Hawk G M Co	California	4	5	Dec 10	Jan 11	Mar 20	B S Kellogg	306 Pine st
Booker Con G M Co	California	1	6	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	1	5	Jan 13	Feb 17	Mar 21	Wm A Van VanBokkelen	309 Cal st
Carmelo Bay Coal Co	California	2	5	Dec 20	Feb 20	Mar 20	John Greif	636 Washington st
Con Dorado M Co	Nevada	1	0	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 16	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	0	Feb 12	Mar 17	Apr 2	J T McGeoghegan	316 Pine st
Eagle S M & M Co	Nevada	12	5	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Fairfax M Co	Nevada	1	15	Jan 25	Feb 28	Mar 20	O C Miller	426 California st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hanover Con M Co	California	2	25	Jan 30	—	Mar 24	Wm A Andoe	327 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
MariposaLand & M Co	California	15	30	Jan 10	Feb 12	Mar 12	Leander Leavitt	309 Montg'y st
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
New York M Co	Nevada	18	10	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 3	Apr 9	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A R Taul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Ætna M Co	Arizona	J S[illegible]ncar	420 Montgomery st	Annual	Mar 24
Armand G & S M Co	California	J L [illegible]elds	240 Montgomery st	Annual	March 27
Atlanta M Co	Utah	E [illegible]ago	420 Montgomery st	Annual	April 5
Buckeye G & S M Co	California	C A[illegible]nkey	331 Montgomery st	Annual	March 28
Equitable T & M Co		Chas J Collins	227 Montgomery st	Annual	Mar 21
Maryland Con G & S M Co	California	J T[illegible]ayson	419 California st	Special	March 22
Melones Con M Co	California	A [illegible]el	419 California st	Annual	March 25
South End M Co	Nevada	R Van Brunt	318 Pine st	Annual	March 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W Traylor	37 Nevada Block	2 00	Feb 20
Indian Queen M & M Co	California	A Durbrow	69 Nevada Block	25	Dec 17
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Mar 12

1215 Tiptop....65c
75 Tioga Con....1¾
1525 Tuscarora....5@10c
300 University....65c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Mar. 6.

155 Alta....5½@5¼
80 Alpha....17½@18
290 Andes....45@50c
165 Best & Belcher..18½@18¼
700 Bullion....5¾
1290 Belcher....6⅜@6½
320 Benton....4.10@4¼
475 Caledonia....2¾@2.70
1660 Con Imperial....1@1.05
160 Chollar....39½
250 C Dorado....10c
185 California....5⅞
275 Challenge....2½@2.65
235 Con Virginia....5⅜
180 Confidence....13¼
450 Crown Point....4¾@4.80
175 Dardanelles....2
455 Exchequer....4.80@5
250 Flowery....80@85c
635 Gould & Curry....9⅜@9½
405 Hale & Nor....14½@14⅝
240 Justice....4.05
1035 Julia....4.60@4.70
505 Lady Wash....1@1.20
460 L Bryan....1¼@1.20
430 Mexican....38@38½
170 Mackey....3.65@3.70
125 Morning Star....3
100 New York....50c
460 N Con Virginia..11½@11½
740 N Bonanza....1.65@1.60
330 Ophir....36@36½
90 Overman....11⅜@11½
590 Phil Sheridan....30@25c
195 Sierra Nevada....45½@46¼
215 Savage....11¾@11½
390 Silver Hill....2.05
500 Succor....50@45c
600 Solid Silver....50c
100 Trojan....25c
130 Utah....14
285 Union Con....69@68
400 Wells-Fargo....15c
635 Ward....1.20@1½
635 Yellow Jacket....17@17¼

AFTERNOON SESSION.

2025 Argenta....1
400 Belmont....45@50c
100 Belvidere....65c
495 Bodie....6@6½
245 Bulwer....17¼@17½
100 Black Hawk....1.65
225 Bechtel....60c
100 Belle Isle....30c
360 Booker....55@60c
400 Chieftain....25c
50 C Pacific....1¾
450 Champion....20@15c
695 Dudley....75@85c
120 Eureka Con....28
300 Esmeralda....1
100 Endowment....5c
120 Grand Prize....4.70@4¾
500 Goodshaw....45@50c
200 Golden Terra....9½@9¾
200 Hussey....15c
500 Highbridge....65c
650 Hillside....2½@2.60

Thursd'y A. M., Mar. 13.

75 Alta....5¼
400 Andes....50@45c
140 Alpha....19¾@19½
1195 Belcher....9@8⅞
660 Bullion....5¾
28 Benton....3¾
800 Brilliant....75c
430 California....6@5½
460 Con Virginia....5½
1715 Crown Point....6½@6
70 Chollar....45@44½
1650 Con Imperial..1.40@1.35
330 Confidence....15½@15
270 Caledonia....3@2.95
590 Challenge....3½@3.35
1400 Dardanelles....1¼@1.15
1915 Exchequer....5½@5¼
250 Flowery....85@75c
199 Gould & Curry...10⅜@10¼
150 Hale & Nor....16½
205 Justice....4.20@4.10
565 Julia....5⅜
70 Kentuck....5½@5¼
30 Lady Wash....1.10
510 Lady Bryan....1.10
515 Leviathan....35@30c
225 Mexican....39¾
150 Mackey....3.85@3.80
200 New York....40c
225 North Con Vir....11½@11
285 N Bonanza....1.70
500 N Sierra Nevada....5c
266 Ophir....35¼@34½
250 Overman....12⅜@12¼
100 Phil Sheridan....35c
30 Seg Belcher....27@25
125 Sierra Nevada....47@46½
70 Savage....13½
255 Succor....45@40c
405 Silver Hill....2.05@1.90
50 Scorpion....1½
400 Solid Silver....45c
80 S Potosi....2.05
600 Trojan....20c
60 Union Con....73½
70 Utah....18@17¾
200 Wells-Fargo....15c
200 Ward....1.65@1.60
230 Yellow Jacket....20@19½

AFTERNOON SESSION.

1325 Argenta....1.35@1.40
300 Belle Isle....30c
100 Bulwer....16½@16⅝
125 Bodie....5½@6
1525 Bechtel....1.30@1.40
2775 Belmont....75@85c
225 Belvidere....50@60c
520 Black Hawk...2.60@2.70
770 Booker....80@75c
140 C Pacific....1¾@1.90
200 Caledonia (B H)....1.90
200 Defiance....90c
450 Dudley....75c
195 Eureka Con....26½@26
100 Goodshaw....50c
225 Grand Prize....4.60
260 Giant & O A....4½@5
50 Gila....30c
400 Hamburg....50@60c
635 Highbridge....60c
50 Independence....1 70
50 Jackson....7½
230 Leopard....85c

645 Independence....1¼@1.40
250 Jefferson....85c
100 Modoc....10c
1000 Martin White....6¾
70 Mono....2¾
310 Manhattan....1½
250 Minnietta Bell....20c
50 Northern Belle....9¾
745 Navajo....10@15c
220 Paradise....1.60@1.80
685 Raymond & Ely....6¾@7
460 Summit....2¼@2.35
400 Star....60@65c
170 S Bodie....30c
1400 S Bulwer....75@80c
140 Tiptop....60@70c
400 Tioga Con....1.40@1½
25 Tuscarora....10c

100 Leeds....70c
15 Martin White....6¼
665 Mono....2.40@2½
255 Manhattan....1½@2
950 McClinton....70@75c
240 Northern Belle....10⅞@11
50 Oriental....5c
350 Paradise....1.60
400 Richer....70@75c
120 Raymond & Ely....6¾
150 Silver King....8¼
1750 S Bulwer....80@90c
1010 S Bodie....25@35c
400 Star....50@55c
50 Summit....2.40
6325 Tuscarora....5@10c
450 Tioga Con....1¾
100 Tiptop....65c

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 12.

100 Alpha....18¾@18½
30 Alta....5.35
190 Belcher....7.95@7.90
20 Benton....4½
30 Black Hawk....2½
100 Best & Belcher...19¾@19½
30 Con Virginia....5¾
375 Con Imperial....1.15
150 Crown Point....5¾
70 Caledonia....3.05
75 California....5⅜@5¼
20 Challenge....3 10
20 Chollar....43
160 Exchequer....5@5¼
10 Gould & Curry....10⅜
150 Hale & Nor....16¾@16½
200 Justice....4.20
350 Julia....5⅝@5.60
120 Mexican....39¾@40
150 Ophir....35½@35⅜
10 Overman....12
50 Phil Sheridan....30c
100 Savage....13¾
40 Sierra Nevada....46½
70 Silver Hill....1.95
60 Utah....18
10 Union Con....73½
130 Ward....1.65

40 Yellow Jacket....19½@19¾

AFTERNOON SESSION.

20 Andes....40c
200 Argenta....1¼@1½
50 Belcher....8¼
50 Bullion....5¾
100 Booker....85c
60 Black Hawk....2.60@2½
40 Benton....4½@4
55 Caledonia....3½@3.05
310 Con Imperial....1¼
50 Con Virginia....5¾
10 Crown Point....5.30
200 Endowment....5c
25 Hale & Nor....16¼@16¼
180 Julia....5.65
300 Mariposa....4½@4
50 Mackey....3.85
180 Niagara....2@1.95
150 New York....40c
50 Ophir....35½@35¼
100 Phil Sheridan....35c
50 Savage....13¾
40 Silver Hill....1.95
200 Trojan....20@23c
750 Tuscarora....6c
320 Ward....1½@1.70
100 Wells-Fargo....15c
40 Yellow Jacket....19¾

California Board—Latest Sales.

Wed'sday A.M., Mar. 12.

50 Alpha....18@16½
1000 Atlanta....5@4c
40 Alta....5½@5½
650 Ætna....17c
50 Black Hawk....2.40
125 Belmont....80c
250 Brilliant....75@45c
40 Best & Belcher...20½@20½
60 Belcher....7¼@7⅞
30 Bullion....5¼
50 California....5½@[illegible]
45 Con Virginia....5½@[illegible]
220 Con Imperial....1.15@1.17
40 Crown Point....5
30 Chollar....42
130 Challenge....[illegible]
40 Exchequer....[illegible]
250 Favorite....[illegible]
100 Globe....[illegible]

40 Gould & Curry...10⅜@10⅛
40 Hale & Norcross....17
80 Justice....4½@4.20
30 Julia....5⅜
40 Mexican....40½
1000 Monumental....4c
100 Mint....17c
400 N Sierra Nevada....6c
1000 N Monumental....6c
30 Ophir....30½
100 Succor....25c
100 S Utah....12c
70 Savage....[illegible]
10 Sierra Nevada....[illegible]
200 [illegible]
[illegible]
[illegible]

Mining Share Market.

The past week has been peculiarly trying on the nerves of our stock people. Not that the unfavorable fluctuations have been so large, but the market has been so chaugeable, so fitful, that it has eitber led operators astray or left them in painful uncertainty as to what it would do next. There have, in fact, been sovoral "breezes" during the week, but as nothing conld be discovered to justify them, they fell almost as quickly as they rose. Tbe weakness which characterized last week's proceedings was present at the opening of this, and the same slow, steady decline was plainly perceptible. A gentle upward push was given generally along the line on Monday. There was no regularity in the advauce, but the general tendeucy was upward. The cause of it can only be coujectured. It is supposed to have been due to rumors of further negotiatious between Mr. Sutro and the Comstock managers. The water stocks were strong at an advance in this "bullish" appearance, Union being the feature at the north end. On Tuesday the braces were suddenly taken out and the propped market immediately fell, a general decline characterizing the day from opening to close. Toward the end of the week there was again a slight improvement, though, as heretofore, what caused the appreciation was kept in the background. At the finish, while there was depressiou in the prices of some securities, and all transactions were limited, there was an affecting rise in others, and the market closed with a quiet steadiness.

Additional Rights to Homestead Settlers.

Following is the full text of the act granting additional rights to bomestead settlers on public lands within railroad limits, approved March 3d, just before the adjournment of the last Congress:

"*Be it enacted, etc.*, That from and after the passage of this act, the even sections within the limits of any graut of public lands to any railroad company, or to any State in aid of any railroad or military road, shall bo open to settlers under the Homestead laws, to the extent of 160 acres to each settler; and any person who bas, under existing laws, taken a homestead on any even section within the limits of any railroad or military road land grant, and who, by existing laws, shall have been restricted to 80 acres, may enter, under the Homestead laws, an additional 80 acres adjoining the land embraced in his original entry, if sucb additional land be subject to entry; or if such person so elect, be may surrender his entry to the United States for cancellatiou, and tbereupon be entitled to enter lands under the Homestead laws the same as if the surrendered entry bad not been made; and the person so making an additional entry of 80 acres, or a new entry after surrender and cancellation of bis original entry, shall be permitted so to do without payment of fees and commissions; and the residence and cultivation of such person upon and of the land embraced in his original entry shall he considered residence and cultivation for ,the same length of time upon and of tbe land embraced in his additional or new entry, and shall be deducted from the five years residence and cultivation required by law: Provided, tbat in no case shall a patent issue upon an additional or new homestead entry under this act until tbe person has actually and in conformity with the Homestead laws, occupied, (resided upon and cultivated tbe land embraced thereon at least one year.

Bullion Shipments.

Since our last issue, we have noticed tbe following bullion sbipments: Hillside, March 5tb, $5,220; Tybo Con., March 1st, $4,119.89; Tybo Con., March 5tb, $3,975.29; Standard, March 8th, $19,529.91; Nortbern Belle, March 5th, $6,196.99; Paradise Valley, March 9tb, $2,843.25; Grand Prize, March 10tb, $12,500; Hillside, March 11tb, $4,740; Christy Con., March 11tb, $5,463.

THE name of Rev. H. W. Reed has been stricken from tbe roll of tbe Baptist Minister's Meeting of San Francisco, for misrepresentations at the East regarding the Chinese question.

THE Central Pacific Railroad Company are doing a good business despite the dull times. The earuings for February came up to $1,093,000—a gain of $112,500.

THERE are said to be an average of 50 applicants for each of the subordinate vacant offices in the new Congress, and members are nearly distracted.

ARRANGEMENTS bave been made for commencing work on tbe Canada Pacific railroad at an early date.

IT is stated that the position of director of the geological surveys will be given to Clarence King.

T[illegible] New York Bullion Clnb talk of building an [illegible] to cost $1,000,000.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MOORE. *Ledger*, Mar. 8: The first clean-up at this mine was made this week. Including sulphurets it will average about $10 per ton.

VOLCANO DISTRICT ITEMS.—A clean-up of a crushing of 140 tons of ore from the Downs mine yielded $7,000. At the mine the indications are that there is more runs of satisfactory character in store. There is a ledge seven ft in width, and of high-grade ore; in fact it is probably the richest body of quartz in the county. The quartz is of a whitish character. The mine and mill give steady employment to 65 men. The survey has just been made of a road, 14 miles in length, at Cape Cruz gulch, between the mine and mill. A Santa Cruz company has located 40 acres of gravel mining ground, one and a half miles north of Volcano. The ground is supposed to be rich, but great difficulty has been experienced in getting rid of the water. The present company propose to put up an engine, sink a shaft and prospect in a thorough style. The Grass Valley gravel claims are in full blast, and the owners are sanguine of its success. The Volcano tunnel is in 1,300 ft, with over 900 ft still to be bored.

OTHER NEWS.—The Hercules is progressing finely; shaft down 100 ft. At the bottom a tunnel runs north along the vein 70 ft. It is now decided to put down the shaft 200 ft deeper. An improved method of hoisting rock at this mine consists of a self-dumping car. It needs no bucket-hand, and this effects a considerable saving. The Centennial is still working. One night last week the shaft belonging to the rope-drum was twisted off. The Centennial mill shortly to be started on ore from the Victoria. Fifty tons are on the dump, estimated to yield $12 per ton. The Fort John mine is developing slowly. Work is let by contract, and only two men are employed. These parties claim the ground, and the prospect is fair for considerable litigation before the question of ownership is settled.

CALAVERAS.

BANNER MINE.—Cor. *Chronicle*, Mar. 8: The shaft bas been sunk to 100 ft, bringing to light a well-developed vein, rich in precious metal. Its engine are 35 horse-power, and employs 20 men.

SAN PEDRO.—This mine has attained a depth of 150 ft, with fine, regular walls from six to eight ft apart, encasing a true flume vein.

HOEY & STERR.—*Chronicle*, Mar. 8: Work was resumed in the Hoisy & Sliter mine on the 3d inst., operations so far being confined to getting things in readiness for taking water out. A San Francisco company has bonded the mine for 60 days, with the privilege of purchasing at the end of that time or abandoning it as they see fit.

MAMMOTH. A clean-up has recently been made at the Mammoth hydraulic (J. C. Veith proprictor) that would be considered phenomenal if the claim was located anywhere else but here. It was large enough to permit the declaration of a dividend of about $4,000 per share. That, for a short run, is one of the best yields ever heard of. The Mammoth stands at the head of hydraulics in the middle and southern mines.

FRESNO.

FINE GOLD.—Cor. *Republican*, Mar. 5: Work in the Fresno Gold Mining company's mines is in full blast. The works were started up on the 24th of February. Twenty men are now employed and a larger force will be put on as soon as the necessary arrangements can be made to work to advantage. Ore of a high grade is being taksn out and the mine belonging to the company will be started up next week. Another five-stamp battery will soon be added.

LOS ANGELES.

SILVERADO. Cor. Anaheim *Gazette*, Mar. 8: But little work has been done at any of the mines. The Blue Light company prosecuted work upon two tunnels, with six men employed, until about the 1st of February, when all work was suspended. This company is endeavoring to consummate arrangements with San Francisco parties for the erection of reduction works, two experts in the interest of those parties having visited and inspected the mine during the past month. Morgan & Mills have continued work during the entire winter on the Mountain Lode, and are sanguine having developed a good paying ledge carrying both silver and gold. The mill enterprise of Capt. John L. Bray of San Francisco, has not been consummated according to the original contract, which called for the completion of a 10-stamp mill on or before March 1st. The failure is reported to be caused by the illness of Capt. Bray and the death of his partner. Advices from Capt. Bray state that he now has arrangements completed for the fulfillment of the contract, with an extension of time. Sixty days further time is asked, which the interested parties will no doubt grant.

INYO.

GOOD PROPERTIES.—*Independent*, Mar. 1: Mining progress just now and around Cerro Gordo is by no means slow. The Yucio is still yielding plenty of rich ore. The Diaz brothers are opening the San Lucas, in a four-ft ledge of splendid milling ore, sufficient to constantly supply a 10-stamp mill. The Palma mine, owned by Messrs. Hughes & Dix, is producing fine ore and free gold. At the dump of the Guymas mine, being developed by Antoine Moreno, there is 60 tons of high-grade galena, and the property bids fair to equal the Union in value. The gold ledge of Beveridge district, since having been opened during the winter to the depth of 100 ft, show stronger and richer ore bodies at the bottom.

UNION CON.—Lately good miners have been in demand at Cerro Gordo. Since the visit of Messrs. Belshaw & Beaudry, some two or three weeks ago, work has been pushed ahead all matters with increased vigor. New drifts have be started, and all of them look well. The water-works, after lying idle all winter, during which snow was used, were started up on the 23d inst. The lower furnace is to be fired up again soon for a long run.

MONO.

RED CLOUD CON.—Bodie *Standard*, Mar. 10: On the 400 level the Red Cloud ledge bas been cut at a point 155 ft from the shaft. The ledge is about three ft wids, and contains the same ore rock which characterized it in the levels above. Drifts have been started north and south on the ledge. The west crosscut, same level, is now in 94 ft. The blue rock in this crosscut has given way to the reddish-brown porphyry, characteristic of the 250 level, and in which the best mines of the district have been found. The indications now are that the country is pitching to the east, while it sssmed to be pitching west on the 250 level. On the 250 level the winze on the Packard and Morton ledge was stopped at a depth of 25 ft, in consequsnce of the accumulation of water, of which there is considerable in this ledge. All down this winze the same fine prospects in coarse gold could be obtained which were found when the ledge was first cut. The west crosscut, from the north drift of the same level, has cut through two ft of clay, and appears to be in the casing of the ledge.

BLACKHAWK. The Warren vein, which was struck last week on the 200 level, new shaft, has been developed to a distance of 12 ft south from the crosscut, showing a fine four-ft ledge of valuable gold-bsaring quartz. A north drift has also been started, which shows the vein in that direction to a good advantage as in the south. The crosscut is both advanced west for the second ledge, in exceedingly hard porphyry. Work has been retarded by visitors. The second ledge will be struck in a few days. The shaft is now down 305 ft. At 320 ft another level will be started, and a crosscut run for the ledge again.

STANDARD. [illegible] change in tbe east crosscut from this main shaft; total length, 328 ft; progress for the week, 28 ft. The south drift from the crosscut has been advanced during the week 22 ft. The ledge is four ft wide, and looks well. The north drift from the east crosscut, 300 level, has been run 14 ft; total length, 96 ft. The ledge here is two ft wide of very good ore. North drift on West Standard is in 100 ft from west crosscut. The ledge is 18 inches wide of very rich ore. Connection has been made between the West Standard south drift and the drift coming from the south line. The ledges have come together. The north drift on the Cook ledge is in 150 ft from the southern boundary. The ledge is 18 inches wide, of very fine ore.

CON. PACIFIC.—The winze being sunk on ledge No. 2, 65 ft from the month of the tunnel, is down 57 ft. The ledge has pitched eastward so as to constitute tbe hanging wall of this winze, and is over 20 inches in width of an improved grade of ore. Progress will be more speedy hereafter, as three shifts of men will be employed. Work on the new central shaft, 550 ft south of the winze, was resumed on Saturday with increased force, and will be continued as a double-compartment and timbered with square sets. It is now 172 ft in depth, with indications of a favorable formation for crosscutting.

MARYLAND CON.—Work upon this mine is being pushed as rapidly as possible by the company. Their shaft is now in red porphyry and a ledge of considerable size of decomposed quartz. A crosscut will shortly be started for the Bonanza ledge, as there is no better showing in the camp.

AN IMPORTANT WORK.—The north drift from this Mono shaft, 400 level, has reached the Bodie line, 125 ft north of the Mono hoisting works. A crosscut will at once be run east and west tbis entire width of the two mines, 600 ft, and a station for a turn-table, etc., is now being cut out at the boundary line. This work is one of great importance. The 400 level of the Mono is equivalent to the 500 level of the Bodie new shaft. The proposed crosscut will bo very likely to demonstrate what there is in the south end of the Bodlo mine, as well as the value of this Mono.

NEVADA.

THE HUDSON MINE.—*Herald*, Mar. 0: The shaft is down 155 ft, and the ledge keeps improving in thickness, quality of rock, and is becoming better defined. At the bottom of the shaft the ledge is five feet thick. Tbe stoping thus far has been done on the south side toward Deer creek. The mins was bonded some tims ago, and the parties bonding will, without doubt, effect a sale to an Eastern company. A nsw road has been graded from the Pleasant valley road along the brow of tho Beckman bill down to the mine.

BLOOMFIELD MINE.—Tbe company are now washing through shaft No. 9, which is the uprise at the end of this main tunnel. They will still use sbaft No. 8, wbich has been the inlet into the branch tunuel beretofore in use, in case of stoppage of operations in shaft No. 9, so that no time need be lost.

PROVIDENCE MINE.—The upriss for the new sbaft, at the Providence mine, has been completed. The shaft was started from ths 600 level, and from the starting point to the place where it comes to the surface on the side of the hill is nearly 800 ft. Soms very rich rock was cut through in making the upriss. The new shaft gives a splendid chance for air. The air now is just as pure as at the surface.

SNEATH & CLAY MINE.—This mine has been rscently purchased by Messrs. Shoecraft & Sprague. It is proposed to incorporate it and sell the stock here. The stock of the company is divided into 100,000 shares at a par value of $10 psr share. The property consists of 1,100 ft of gold-bearing quartz. There is a 12-stamp mill on the mine, with hoisting works, and these are supplied with three engines and two boilers. Besides there are sheds and other necessary buildings. It will cost about $1,500 to start everything in working shape. The incline is down 470 ft, with four levels which bavs been run, and from which over $400,000 were taken out; the company will incorporate as soon as 40,000 shares of the capital stock has been subscribed. The mine is at present in ths hands of mining engineer, Fred. A. Sacket, Esq., who is receiving subscriptions for the stock.

THE DEADWOOD MINE.—*Transcript*, Mar. 7: The average amount of ore now being extracted is 15 tons to every 24 hours. A crushing of 185 tons has just been made, and there is besides 200 tons more on the dump. Workmen are engaged in attaching pipes so that in a few days the mill and hoisting works will be run by hurdy-gurdy power at an expense not exceeding $4 or $5 per day.

THE SMITH MINE.—The north drift is now in over 50 ft. The last 12 ft of it has been in solid boulders, but there is a good prospect for shortly being in soft granite again. The drift extends along a small ledge tbat increases in size and quality as it is developed. It is expected tbat 150 ft more will reach the rich chute that was formerly worked down on 80 ft and paid over $100 per ton. The chute is supposed to be at least 200 ft long.

PLACER.

THE KEEHNER & HOLER QUARTZ MINE.—*Herald*, Mar. 8: Messrs. Keehner & Holer are now sinking a shaft on tbs old New York ledge, on the old Poland ranch. The shaft is now down 38 ft. They bave raised 26 tons, which milled at the rate of $13 per ton. This enterprise shows that there is an abundance of quartz in and around Duncan hill which may be made remunerative by the application of individual industry.

THE BOOTH QUARTZ MINE.—This mine is now leased to Messrs. Robinson, Ferguson and Gould Bros. Tbe shaft is down 175 ft. The hoisting works, which are operated by a whim and horse-power, are in fine working order. The rock pays from $8 to $10 per ton. The ledge is from two to five ft in width. The indications now are that the company is raisiug sxcellent milling rock, to be erushed in Messrs. Simons & Pelster's quartz mill on North Ravine. The Booth mine failed to be remunerative in the hands of a stock company some years since, but undsr the control of practical miners its bids fair to become valuable property.

IOWA HILL ITEMS.—J. B. Hobson's claim, at Independence hill, had run seven days when it was compelled to shut down for want of water. The Orion mins is owned by capitalists of Springfield, Mass., and San Francisco. The superintendent is W. W. Anderson, of Gold Run, an experienced and thorough miner. Night and day shifts of men are working on the rimrock and into tbe Sugar Loaf. They are at present using about 625 inches of water, and expect to have as much more for use. At the Morning Star nothing can be done until they have a supply of water in the big ditch. Watts Bros. bavs a small claim on Strawberry Flat in which washing is going on, the water supply coming from Indian canyon. Ths men have some heavy rock to work and found it necessary, on this account, to put up a powerful derrick last fall. The mast is 60 ft high and the boom 50 ft in length. Entwistle's claim is running with 250 inches of water. Joseph Byrne and David Beardsley are about to work a 10-stamp mill on the Columbus mine on Roach hill. John Mills has a small hydraulic mine which will pay well this season if he gets the necessary water. Anton Phillips, a Portuguese, has a hydraulic claim here that has always paid well when ths watsr season permitted of its being worked. The owner generally has two or three men besides himself to operate it. The mine has not been worked this season.

SHASTA.

WHISKYTOWN.—Cor. Reading *Independent*, Mar. 6: Knox, Woodward & Co. have run a tunnel on their lead about 100 ft. Although they have run through some very inferior rock, they have now reached a place where it prospects very rich indeed. They have quite an amount of quartz on hand and are running the arastra as fast as the water will permit. A clean-up of some of the quartz taken out last summer yielded about $80 per ton. Mr. Banghart's mins, same diggings, on Mad Mule, is yielding very rich. We have just seen weighed over 40 ounces of pure gold, which he lately took out in one day. He has run a tunnel into the hill several hundred ft. He expects to reach a very rich point soon, at which he sank a shaft last summer, but owing to the water, could not sink it further. Ths Morning Light, a new mine recently discovered at the head of Murderer's gulch, about one mile west of Whiskytown, is prospecting well. A tunnel is being run and it is expected that the ledge will be reached within a few days. At the Peckham mine, now owned by Stroud & Co., the work is being pushed quite rapidly. The mill has been received on the ground and will be in operation within a few weeks. Work on the extension is being rapidly pushed forward. Their arastra runs night and day, but on account of scarcity of water, can do but little more than half work. Williams & Ketchum are working their claim on Saw Mill flat. They have an abundance of water and are receiving good returns.

TUOLUMNE.

A NEW INTEREST.—*Union-Democrat*, Mar. 8: Th Scsbcr claim, a short distance below town, begins to assume an appearance of business. The shaft has already been sunk to a depth of 40 ft. Ths vein is about 18 inches wide. The rock taken out looks well, and the parties at work represent that it prospects encouragingly. The intention is to sink to a depth of about 50 ft, and then to start a drift. The bottom of the shaft is now several ft below the bed of Woods creek, and water begins to retard the work. The present outlook of the mine is promising, and it is to bs hoped that it will prove a success.

NEVADA.

WASHOE DISTRICT.

CALIFORNIA.—Gold Hill *News*, Mar. 12: The drift, 1650 level, connecting the C & C shaft and the Con. Virginia shaft, is receiving needed repairs. The joint Con. Virginia winze from the 1950 level is down 07 ft, and still in hard blasting porphyry. The joint drift on the 2150 level continues to make rapid progress in hard blasting porphyry. The C & C shaft is cutting dry, hard rock, and nearing the 2300 level. Tbe daily yield of the mine is about 240 tons.

MEXICAN.—A joint Ophir upraise has been started from tbe 2100 level of the Ophir to meet the drift running north on the 2000 level for ventilation. The joint Union Con. ineline winzs is now 278 ft ou the slope bslow the 1600 level, and in hard blasting porphyry. The nortb drift, 2000 level, continues in soft porphyry, through which it is making ssven ft per day.

OPHIR.—Repairs to the main shaft, above the 1465 lsvel, bavo been continued. Work in tbe ineline has been resumed. From the main north drift, 2100 level, a joint Mexican upraise has been started fer the 2000 level for ventilation.

SAVAGE.—The pumps are holding the water at the 2040 tank. Repairs to the vertical sbaft and incline continues.

EXCHEQUER.—North drift, 2400 level, is in soft ground, requiring to be timbered. The vsin widens as tbis drift is pusbed on north.

CON. VIRGINIA.—Repairs to the shaft below the 1400 level have been rendered necessary by its gradual sliding to the east so as to interfere with the running of tbe cages. Repairs to the 1650 connecting drift are being made. The joint California winze is making two ft per day through hard porphyry. Three ft per day are being made in the joint drift 2150 level to connect with tbs joint winzs, the material encountered being porphyry.

SIERRA NEVADA.—The sump at the bottom of the east sbaft has been completed and a drift started on the 2200 level to meet that comiug north from the incline. It is now 60 ft below the 2300 level. The north drift, 2200 level, is still in soft grouud, the face 390 ft from the north crosscut. Good progress is being made in the upraise from tbe 1700 level to connect with tbe North Con. Virginia shaft.

GOULD & CURRY.—Repairs last week stopped developments, but work is now making usual progress. The winze on the Savage line is being sunk from the 1900 level to the 2000 level, and crosscuts east are being run joint with the Best & Belcher on both the 1700 and 1900 levels. The Osbiston shaft is still encountering a heavy flow of water, the pumps raising 30 miners' inches.

NORTH BONANZA AND FLOWERY.—Ths water tank at the 300 level of the joint shaft is ready to calk and the rock chute is completed. An engine of sufficient capacity to sink 2,000 ft was bought yesterday, and will soon be placed in position. The north drift is following the ledge at the rate of six ft per day. There is no water there to hinder operations.

BELCHER.—The main incline is now 125 ft below the 2560 level. The south drift on the 2560 level is averaging seven ft per day.

UTAH.—Repairs to the incline during tbe past week have somewhat delayed operations at other points. A water tank has been put in near the bottom of the incline, so as to be in readiness when the standing pumps are in place.

OVERMAN.—The winze from the 1600 lsvel is still in porpbyry containing streaks of quartz, which are increasing in size with depth. The north drift, 1600 level, is in soft vein matter from which some water seeps in. Tbe O & C shaft is down 470 ft in good working ground.

YELLOW JACKET.—Put in the new air-compressor. The engine of the compressor is now on its bed. The work of putting in the air pipes is progressing well.

HALE & NORCROSS.—The winze from the east drift, 2000 level, is nearing the 2100 level. The pumps are all holding ths water below the 2000 level.

CROWN POINT.—The north drift, 2500 level, is still skirting the ore vein, laying it bare ready for crosscutting.

BULLION.—An airwry is being cut in the crosscut, 1340 level, for better ventilation. The formation encountered is still porphyry and quartz. The foundation stones for the new air compressor are being laid, and the shaft is undergoing repairs at the 500 station.

BEST & BELCHER.—The general overbauling at tbe Gould & Curry last week interfered with work in tbe mine somewhat, but operations are now going on as usual. A joint drift is being run with Con. Virginia west on the 1700 levsl and joint crosscuts east with the Gould & Curry on botb the 1700 and 1000 levsls.

JULIA CON.—Pumping to the surface and into the Sutro Tunnel. The sprung and twisted reel shaft has been replaced by a new ons. Tho bailing tanks have been taken out of the shaft. Therc has been a good down current of air again given to the north compartment of the sbaft. The 2000 level has not yet been freed from water.

MT. HOON & VANCOUVER.—Last evening tho 1400 level of the Mint shaft was drained and the water was taken from the sump 25 ft below that level.

WARD.—Work in the east crosscut, 800 level, will be resumed the last of this week. The men are digging tbe trench for the water pipe from the tank to the works. The new engine will start as soon as tbe new skeet is ready for use.

NORTH CON. VIRGINIA.—Tbe shaft is still encountering the hardest kind of rock, but making three ft per day. It will connect with the upraise from the 1700 level of the Sierra Nevada in about 10 days.

UNION CON.—Tbc work of enlarging and retimbering the north drift, 1450 level, connecting with the Sierra Nevada, continues. Ths joint Mexican winze from the 1000 level is down 278 st on the slope, in hard blasting porpbyry.

CROLLAR-COMBINATION SHAFT.—The work of putting in the 6-inch pipe for the air compressor has been completed, and the compressor itself is being put in place as fast as possible.

JUSTICE.—At the old Waller Defeat ground, three shifts of seven men each ars employed extracting ore which is being worked at the Pappoose mill. The capacity of this mill is 20 tons per day, and it is kept running.

CON. IMPERIAL.—South drift, 2000 level, to connect with the old workings of the Yellow Jackst, is in 50 ft, and in fine looking quartz.

LADY BRYAN.—Sinking below the 600 level as usual. The drifts north and south on this level are still being driven ahead and making good progress. The [illegible] to the south is in very fine looking quartz, but of low grade. The one north is outside tbe quartz for [illegible], but is in the vein.

LEVIATHAN.—The face of the north [illegible] the

[Continued on Page [illegible]]

The Troublesome Teredo.

[Written for the PRESS by W. A. LAWSON.]

His Habits and Associates.

The teredo, or as it is more commonly called, the ship-worm, was formerly supposed to be a native of the tropical seas and to have been carried by ships into the colder waters, as it is now found along the northern coasts of Europe and America, and is in many places exceedingly destructive. But this belief has been recently proved to be erroneous. In the course of some excavations made at Belfast, the trunks of a tree, entirely riddled by the teredo, was found twelve feet below the surface, in strata of an age long previous to the days of navigation, and fossil woods, once the home of the teredo, have been found in many other localities, at considerable depths; facts which prove that the teredo has inhabited from a remote period the waters of the temperate zone. The most familiar species is the *teredo navalis*, which has always been met with in the Bay of San Francisco.

The teredo has of late years been the subject of much study by some naturalists, and much thought has been expended and many experiments made in the attempt to devise means of protection from its ravages. In waters where this pest abounds, a solid stick of timber, unprotected, becomes completely honeycombed in a year or two and may be broken by the slightest shock.

At Norfolk Navy Yard, a piece of wood, which had been immersed in sea-water only eight days, was penetrated by a teredo to the depth of one-eighth of an inch. They are so small when they enter the wood as to be almost invisible to the naked eye. The worm, as it may be called for convenience, enters at right angles to the grain until fairly into the wood, and afterwards excavates in a direction parallel with the fibers, diverging only to avoid some obstruction in its path. When full grown they measure from one to two and a half feet in length. It makes its home in the wood and derives its food entirely from the water. As it grows it constantly extends its cell or gallery, but avoids an intrusion into the lodging of another.

The teredo's method of perforation has been a matter of dispute, but late researches have shown that its excavations are accomplished by means of a partial rotary motion imparted to its bivalve shell. This shell is attached to or forms part of the larger or superior extremity of the teredo, which does all the boring. Through the inferior extremity which is constantly protruded into the sea, the teredo sucks up and circulates through its system, by means of syphon tubes, a constant current of water, containing the infusoria upon which it lives. It is hardly possible to apply the terms head and tail to a mollusk which bores at one end and feeds at the other. A muscular organ, called by naturalists its foot, and by which it holds itself firmly against the head of its gallery, while boring, projects from between the valves of the shell at that end of the teredo, which one would naturally call the head. The worm has a complicated muscular system for a creature whose whole life is devoted to the making of a hole and to filling it with its own growth. The cells made by it are commonly from one-quarter to one-third of an inch in diameter at the larger end, gradually increasing in size from the minute orifice by which its entrance was effected. Thus the teredo makes its home a prison that it never leaves. And so a timber whose surface may show no sign of its depredations may be completely riddled within. At first sight, the teredo would appear to have accomplished the problem of pulling its hole in after it.

Another timber-worm, still more destructive in its action, is of the order *isopoda* and genus *limnoria*. The best known species is the *L. terebrans*, much smaller than the teredo, being at maturity only from one-fifth to one-half of an inch in length. The limnoria penetrates at right angles to the line of the fibers and pursues its course across the grain of the wood. Countless numbers of these limnoria attacking a pile from all sides, eat almost into the heart of the timber, so that it may be broken by a slight lateral strain. T. J. Arnold, Engineer to the Harbor Commissioners, in his report made to the Board in February, 1873, states that the limnoria had only recently made its appearance in our waters. Since which time it has become as troublesome as the teredo.

Still another timber destroyer now inhabits our waters. Mr. J. R. Scupham, Asst. Engineer of the C. P. R. R., discovered it about two years ago in San Francisco bay, and it seems to be fast increasing in numbers. This last arrival is a crustacean of the genus *chilura*, and species *terebrans*. It is much larger than the limnoria, and attacks timber in the same way, by cutting across the grain of the wood. From the fact that it enters the piles just above the mud, it may do great injury before its presence is known or even suspected. What its fate may be in our waters it is impossible to determine. It is supposed to have been brought here by shipping from Australian ports.

Neither the teredo nor the limnoria will thrive in brackish waters. They require sea water, free from all impurities, and avoid places where the water is contaminated by the discharge from sewers. They do not attack piles while the bark remains on, but wherever the timber becomes exposed there they enter; with this difference: the teredo always penetrates from below low-water mark, while the limnoria most frequently attacks just below the line of high water. It is thought that the latter likes to take the sea air between tides. The Commissioners state that in the harbor of San Francisco the bark protects the piles for about two years, and that in the course of five years more they have to be renewed.

In the archives of Holland, is preserved a paper by Dr. E. H. Von Baumhauer (of which a translation appeared in the *Popular Science Monthly* for August and September, 1878,) containing a description of many methods for the preservation of timber, that were tested in Holland, under the direction of the Royal Academy of Sciences of Amsterdam. Of these methods were two classes: coatings applied to the surface of wood, or modifications of the surface itself; and impregnation of wood with different substances which modify the interior as well as the surface of the wood. Of the first class, eight processes were submitted to the Commission, including metallic paint; mixture of coal tar, resin and sulphur, applied hot; paraffine varnish; coal tar, applied cold in successive layers; turpentine; linseed oil; color paints, and charring the surface of the wood. Specimens of wood treated by these processes were placed in sea water in May, 1869. An examination made six months afterwards convinced the Commission that none of them were effective, and that no mere exterior application could guarantee protection. Of methods of impregnating wood, they examined the following: Sulphate of copper, green vitriol, acetate of lead, silicate of lime, oil of peat, and oil of creosote. The only one of these that found favor with the Commission was that which employed the oil of creosote. They concluded that mere external coatings were insufficient, as they were likely to be injured by mechanical means or were dissolved by the water. As soon as the smallest surface became exposed, the teredo penetrated. Impregnation with soluble salts is ineffective, because they are dissolved by the action of the sea water. In employing the oil of creosote, it is necessary that it be of good quality, the impregnation thorough, and such woods be used as will absorb oil readily. These conclusions were confirmed by subsequent experiments of Belgian and French engineers.

It is to be regretted that the Holland Commission made no experiments with petroleum. It was recommended to the Commission, but on account of its high price at the time, it was thought useless to try it. This substance, now so cheap (selling in Pennsylvania at about two and a half cents per gallon) and abundant in California, might make a most effective preservative if properly used. Some of the heavy California oil, which thickens on being exposed, and changes into a substance called maltha, (allied to asphaltum), would seem well suited to the purpose. Whatever process is used, it appears to be essential that the sap be thoroughly expelled from the wood, and the albumen that remains be coagulated by heat before the impregnation is effected.

The cost of the oil of creosote will probably prevent its general use for this purpose. It is obtained by the distillation of coal tar, and is sold in the Eastern market at about six cents per gallon. It is not manufactured here, and the crude coal tar commands a higher price in this market. One gallon of creosote oil is required for each cubic foot of wood. Various preservative methods employing creosote have been tried in San Francisco, called respectively, the Seely, Robbins, and Woods processes, but none have been satisfactory to the Harbor Commissioners.

A San Francisco company propose to erect works for the preservation of timber by the Thilmany process, which employs sulphate of copper, with the addition of chloride of barium, forming sulphate of baryta, which is claimed to be insoluble in water. Of all the processes tested by our Harbor Commissioners, this is the only one which has so far proved efficacious. They have a piece of Michigan pine which was treated by the Thilmany process, and placed in the water of the Bay, beside a piece of the same wood, unprotected. After an exposure of two years, the pieces were taken up, and the one so treated found intact, while the other was completely riddled by the teredo. The Commissioners are not sure that the process would be efficacious with the Oregon fir, in use in our waters. They are giving some other pieces of wood, treated by the Thilmany process, a longer test.

San Francisco, March, 1879.

PACIFIC COAST EXCHANGE.—A corporation, says the New York *Evening Post*, has been recently organized in that city for the general representation here of Pacific Coast interests. It is called the Pacific Coast Exchange. The intention is to have in this Exchange a collection of specimens of all the products of California, Oregon and Nevada; also, offices for all the railroad companies connected with those States, and for other corporations interested in that territory. Pacific Coast newspapers are to be kept on file, and the rooms are, generally, to be the headquarters of the business of that section in New York. Negotiations, by the corporation, are in progress for the lease of No. 734 Broadway, a brick building, 25x137½, with ornamental iron front, and comprising five stories, with a basement and sub-basement, for the above purpose.

Fish Farming.

Our State has made no small progress, during the year, in stocking public and private waters with fish, and those who breed carp say that their stock has been much reduced by the demands of new water farmers. The work of our fish commission is already bearing fruit in the large catch of desirable fish introduced by them. The public and private development of our resources in this direction can well go on, until ponds and rivers rival adjacent fertile fields in the amounts of food they yield for the support of man. This subject is urged in all States which have energetic fish commissions at work, and the awakening to water farming as an adjunct to land farming, is quite widespread. We notice that Hon. Robert B. Roosevelt, a member of the New York State fish commission, has been addressing the New York farmers' club upon the chances for good yields from their waters as well as their fields, and some of his points are of general application. If the farmer can add to his usual crops a crop of fish, he will be benefiting his neighbors as well as himself. To do so may seem to many at first glance a difficult operation, but not half as much so as making the broad acres "laugh with a harvest" seems to the inexperienced. Fish farming has its rules and limits, precisely as land farming has, but is simpler and far more productive. From a single mature fish millions of young may be produced. A sturgeon contains nearly ten millions of eggs, cod and herring millions, shad hundreds of thousands, and even trout and bass several thousands. With good management these can all be hatched, and in some cases in very few days. Once hatched, and fish provide for themselves; they need no food or care, they convert worthless insects or waste water-grasses into human food. The trout or bass from a farmer's pond costs him nothing but the trouble of catching, and compares in excellence on his table with his best poultry, to say nothing of pork that has been fed twice a day for months. The only loss of time or labor is in the catching, and to reduce that it is only necessary to make the fish abundant.

There is a fish, we well remember to have pulled it from New York waters, which Mr. Roosevelt pronounces especially fitted for farmers' ponds. It is the fresh-water bass, and, if we mistake not, our California commissioners have already introduced it in this State. If so, it may, in course of time, be available for farmers' ponds. Mr. Roosevelt says it is possibly even more valuable than the trout for the farmer's use. It is not so exacting in the character of the water in which it will live, and will grow more rapidly; more important still, it needs no culture or care whatever, or any time. The parents, which are fairly prolific, lay their eggs in a sort of nest and watch over them till they are hatched. Bass have never failed to increase rapidly where they have been introduced, and they are suited to almost any pond. These are especially the fish to be used where water farming is to be combined with land farming in the simplest and easiest way. Nothing is required but to place a few pair of mature fish, which can be easily transported in any water they are expected to populate, and they will attend to the rest themselves. They can hold their own with any other species, even against the dreaded pickerel; they increase rapidly and grow quickly, and as human food they are excellent.

It is hardly the right season of the year now to make fish ponds, but it is well to begin early with the plans and estimates, so that all may be ready when the harvest is secured, to shape the dry basin into a pond, to be filled when next winter's rains swell the streams.

Sonora Anthracite Coal.

About a year ago, a large deposit of excellent anthracite coal was discovered near Barranca, Sonora, and it has been used with satisfaction at the Barranca mill, which is engaged in the pulverization of ores. The mine is six and a half miles from the mill, and in the vicinity of several mining towns. The approaches from Guaymas, from which it is distant 125 miles, are almost entirely level, and there is but a moderate grade from San Antonio. The dip of the coal-beds approximates to 10 degrees, the course being northeast. So far, an incline 70 feet long has been excavated, all the way in anthracite perfectly free from slate. The roof is composed of excellent fire-clay. It is considered by the engineer of the Barranca mill superior to Pennsylvania anthracite, and he testifies that it gives no clinkers. Gen. W. S. Rosecrans reports on a specimen brought to San Francisco that the specific gravity is 1.77, whereas that of Pennsylvania anthracite is about 1.5. Mr. W. Bruckner, M. E., states that an analysis of the coal shows it to have but 2½% ash. He thinks this Sonora anthracite belongs to a much older formation than the anthracite coal of New Mexico, described by him in Prof. R. W. Raymond's report to the Secretary of the Treasury in 1870; in fact, he thinks it is sub-carboniferous, or older than the Pennsylvania deposits. We have no particulars of the grounds upon which this opinion is based, but the appearance of the coal does not apparently confirm it.—*Arizona Sentinel.*

Tribute to American Explorers.

The following tribute to American explorers is from the pen of Prof. T. C. Archer, Director of the Museum of Science and Art, Edinburg, and Centennial Commissioner from Great Britain:

There is nothing in the history of the human race more remarkable than the rapidity with which the wilds of Western America have been explored and added to the domains of civilized man. Middle-aged men can remember the first great rush to the Californian gold diggings, and the export from this country of iron houses for the shelter of the miners where now a splendid and populous city exists, and is the resort of travelers from all parts of the world; whilst in a marvelously small space of time the great State of which that city is the capital, has become one of the most fertile and wealthy in the great Republic, and is now connected with the eastern shores of the continent by 2,000 miles of railway. The spirit of enterprise, no doubt, has had much to do with this wonderful progress; but the far-sighted and liberal spirit of the United States Government has made the task comparatively easy. The careful but energetic surveys, both geographical and geological, which have been working for years past, have made the best routes known, and, in fact, have opened up the heart of the country, and made the most distant and the most desert parts accessible. Fortunately for the Government and the country, men of the greatest fitness for the task were selected, and the great extent of the work they have done proves their industry, as well as the nature of it shows their great abilities. The Atlas of Colorado and portions of adjacent territory, is one of the most masterly works in chartography which any country has produced, and its compact arrangement will make it a welcome addition to every library. It consists of 20 double folio sheets, of which two are filled with cleverly outlined panoramic views of the country surveyed, and two others give the sections of the same geologically colored. Twelve are devoted to the six divisions into which Colorado is divided, one-half of them giving the topographical and the other half the geological features of the country. There is, in addition, a map showing the triangulation of the country, another showing the natural drainage, an economic map indicating the agricultural, pasture and forest lands, and the locality of coal-bearing and metalliferous strata. Of the execution of these maps it is impossible to speak too highly. They have been produced by the talented and indefatigable chief of the surveys, Prof. F. V. Hayden, and are a part of a series of the reports and transactions of the Survey Department, some of which we hope to draw attention to from time to time, as they can generally be consulted in public libraries, to which the United States Government extends its liberality.

A Joint Resolution of Thanks to Dr. Hayden.

The following joint resolution of thanks to Prof. Hayden and his assistants for their "Accurate and Comprehensive Survey of Colorado," was recently adopted by the Colorado Legislature.

WHEREAS, The geological and geographical survey of the Territories of the United States, made under the general government, has been completed for the area embracing the State of Colorado; and

WHEREAS, The publication of the reports, views and maps of this survey form a collection invaluable alike for the advancement of science and the development of the mining and agricultural interests of this State.

Resolved, That the thanks of this Assembly are hereby tendered to Dr. F. V. Hayden, United States Geologist in charge of the survey, and his assistants for the merit of their contributions to the successful achievement of this great work.

Resolved, That a copy of this resolution engrossed on parchment shall be presented to Dr. F. V. Hayden.

A REPORT ON THE DARIEN CANAL.—To obtain a conclusive report upon the practicability of cutting a channel through the Isthmus of Darien, a French company, with the approval of the Geographical Society of Paris and the Society of Commercial Geography, despatched a survey expedition under the leadership of Lieut. Wyse, of the French Engineers, who had already spent many years on the isthmus for a similar purpose. We learn from a foreign exchange that, after two years' surveying this officer has lately returned, bringing with him the completest surveys that have yet been made of six of the most promising canal routes, one of which passes through Nicaragua, while the other five are in Columbia, where the lowest gradients and the shortest routes occur. Although the level of the two oceans differs but slightly, the nature of the intervening country is such as to render it impossible, according to Lieut. Wyse, to dispense with locks or tunneling, or both, on any of the routes he has surveyed.

COMPRESSING BRAN.—We recently referred to some successful experiments in compressing flour. We now learn that some Minneapolis millers are experimenting with machinery for compressing bran, for the purpose of shipment to Europe. It is believed that it can be so compressed as to get as much weight into a given package as the same would hold of flour.

PHOSPHIDE OF CALCIUM on becoming wet will give off spontaneously combustible phosphoreted hydrogen, thus emitting light. This is the principal ingredient used in the distress and guiding signals thrown into the water from a sinking ship, principally to guide those in the water to the boats.

Central American Telegraphs and Railways.

The telegraph lines of Nicaragua and Hnnduras have lately been joined together by the completion of the missing link in Nicaragua territory between Chicbigalpa and the boundary between the two conntries at Rio Negro. Telegraphic communicatinn is thus cnmplete throughout the four Republics of Costa Rica, Nicaragua, Guatemala and Honduras, from San Juan del Sur to Mexico. A moderate tariff is tn be enforced for through uiessages.

In Houduras further extensions of the telegraph system are beiug made, aud 150 miles of new wire are iu course nf completion, in addition to the 500 already opened.

This republic is giving further evidence of its desire to advance hy organizing an "exhibition" on a modest scale, which was open for a short period towards tho end of last year. Happy augury for the bondholders! Honduras bonds at £3 per £100 boud! Honduras having an exhibition!

The Government of Costa Rica is encouragiug the introduction of immigrants for the purpose of constructing railways on the Atlantic coast, and improving the communication between the terminus at Pacuore aud the interior by meaus of carriage roads. The carriage road from San Jose to Las Palmas and the river Sucio is being rapidly pressed forward. Of the total length of about 80 miles only 29 miles are required to complete the work, by which a saving of 20 miles will he effected, compared with the old apology for a road via Cartago. A new port is being constructed nn the Pacific coast, at Cocos, on the Bay of Calebras. The erection of public offices and other works has been ordered by the government, and the port will he, for the present at least, entirely free from all harbor, light, anchorage and nther dues.—*British Trade Journal.*

Prehistoric Remains.—Georgo Carr and others, mining on Lynx creek, says the *Arizona Miner*, have unearthed a bonanza of human remains and curiosities consisting of jaw-hones, ollas, beads, stone-knives, metat-stones, etc. The beads are interspersed with curiously wrought pendants, or flat pieces of blue and green stones of very diminutive size, each punched or drilled in one edge or corner. The heads are of irregular sizes, hut all quite small, some black, some white, and otbers of various shapes and colors, and when strung as they are now, hy the finders, form a very curious and unique specimen of the ornaments, or perhaps charms of a hygone and unknown age. Perhaps the straugest and most interesting phenomenon of the collection is a jaw-bone, which in shape, size and every other feature except that it has not, and evidently never had but three or four teeth, and they directly in front, is that of a human jaw. Whether its possessor in his lifetime was a grass-eater, which after biting it off he swallowed whole and afterwards chewed his cud, or whether this is an exceptional case, and a deformity, some one more learned in anatomy tban we, will have to determine. The mctat-stones are of malpice and very small. These relics were found on the top of the hard cement or false bedrock, some four feet from the surface of the ground.

A Petrified Human Hand.—A curiosity which astonished scientists and puzzled them to account for is now on exhibition in Gould's cahinet at Mill City. It is a perfectly formed hand, which, apparently, helonged to a hoy about 14 years of age. The hand is open, the fingers heing slightly bent toward the palm, on which the thumb rests. The hack of the hand seems tn have been crushed or decomposed hefore it was petrified, hut the palm, thumh and fingers are perfect. We were informed that it was found at the sulphur beds near Rabbit Hole, hy one of the men employed in shoveling crude sulphur into the refining retort, and is supposed to have heen imhedded in the sulphur bank for ages. The fingers are comparatively short, a fact which indicates that it did not belong to an Indian, as the red men's fingers are generally longer than those of the white; hut the thumb is rather longer than the average. Tn wbat race the owner of the hand helonged, and how and when it was imhedded in the sulphur, will probahly remain unknown, nnless some scientist should investigate the hand and the sulphur bank where it was found and explain these mysteries.— *Winnemucca (Nev.), Silver State.*

The New Goloid Dollar.—The first specimen of the metric gold double eagle on the golnid principle, of the full value of $20, coined at the Philadelphia United States Mint, has heen received at the Treasury department. It is a heautiful coin of the size of the old douhle eagle, having a very rich hue. The design of the ohverse side is a head of Liherty surmounted hy 13 stars, hetween which is the metric inscription "30g. 1.5s. 3.5c. 35 grains," helow which is 1879. On the reverse is the double eagle, surmounted by the words "United States of America" and a circlet of 13 stars emhlazoned. Within the circlet is the Latin inscription "Deo est Gloria," in a scroll held hy the eagle the words "E Plurihus Unum," meaning, when translated, "The United States of America—to God is the Glory—of many one." Beneath this the words "twenty dollars." The coin has heen handed over to A. H. Stephens, Chairman of the Committee on Coinage. It is patented hy William Wheeler Huhhell, and is the companion coin of the goloid dollar.

Useful Information.

Fresh and Stale Bread.

The celebrated French chemist, M. Bousingault, has recently investigated the nature of the change which bread undergoes when it becomes stale. Up to the present time this has not been well understood.

A circular loaf, 12 inches in diameter and six inches thick, was taken from an oven heated to 240° Reaumer, and a thermometer immediately forced three inches into it. The thermometer indicated 78° R. (207.5 F.) The loaf was then taken to a room at a temperature of 15° R. (66° F.), and was found to weigh seven and a half pounds. In 12 hours the temperature of the loaf sank to 19° R. (73° F.), in 24 hours to 15° (66° F.), and in 36 hours to 14° (63.5° F.). In the first 48 hours it lost only two ounces in weight. After six days the loaf was again put in the oven, and when the thermometer indicated that its temperature had risen to 55°R. (156° F.), it was cut, and was found to be as fresh, and to possess the same qualities, as if it had been taken out of the oven for the first time; but it had now lost 12 ounces in weight. Experiments were also made on slices of the loaf with similar results, proving that new bread differs from old, not hy containing a larger proportion of water, hut hy a peculiar molecular condition. This commences and continues to change during cooling, but by again heating the bread to a certain temperature it is restored to its original state. It is this mechanical state which makes new bread less digestible than old. The former is so soft, elastic, and glutinous in all its parts that ordinary mastication fails to reduce it to a sufficiently divided condition. It forms itself into hard balls, which are almost unaffected by the gastric juice. These halls often remain in the stomach, and, like foreign hodies, irritate and discommode it, inducing all sorts of unpleasant feelings.

Electro-Bronzing on iron has heen brought to a high state of perfection hy the Philadelphia Smelting Company. This company has taken out patents covering the process for putting on iron a durable electro-bronze finish, which is claimed to possess the beauty aud finish of real bronze at a very much lower cost, and to be wholly unaffected in color, etc., hy the action of the atmosphere. The following is the process adopted: The articles to he bronzed are first put in a bath of paraffine, which stops further oxidation; they are then coated with a metallic substance and subjected to the electro-bronzing bath, after which they are treated with a peculiar protecting varnish, and are then ready for use. The metallic substance with which the articles are coated is called "Deoxidized Bronze," and is claimed to possess in a remarkable degree all those features for which alloys are valuable. It is composed entirely of copper and tin, the peculiarities in the resulting texture being entirely due to to the flux used and the method of treatment. It is said to possess superior malleability, approaching gold alloys in this respect, while its tenacity and solidity are very great. Specimens eight inches long admit of heing douhled up without apparent injury to the structure. It flows readily, is easily haudled by ordinary workmeu, and is capable of reworking from old scrap. It is also receptive of a high, smooth finish, wears well, and is largely used for machine journals, car bearings, and other purposes of a similar nature, where a durahle anti-friction metal is required.

New Varnish for Foundry Patterns.—A varnish for foundry patterns and machinery has been patented in Germany, which dries as soon as put on, gives the patterns a smooth surface, thus insuring an easy slip out of the mold, and prevents the patterns from warping, shrinking or swelling, as it is perfectly impervious to moisture. This varnish is prepared as follows: Place in a vessel 50 pounds of shellac, 10 pounds of manilla copal, and 10 pounds of Zanguebar cópal, and heat it by the external application of steam for four or six hours, stirring it in the meantime constantly. Then add 150 parts of the finest potato spirit, and heat the whole during four hours to 190 deg. Fah. This liquid is then dyed by the addition of orange color, and can he used for painting the patterns. When used for painting and glazing machinery, the varnish may consist of 35 pounds of shellac, five pounds of cocoriel copal, 10 pounds of Zanguebar copal, aud 150 pounds of spirit. Similar varnish to the ahove is used quite extensively hy pattern-makers in this country, and much of the superior appearance of American castings is duo to its use.

To Cast Brass Solid.—The metal should not he run auy hotter than is necessary to insure sharp castings. The most probable cause of the honey-combings of castings is that the air can not get out of the way; and there ought to be proper vents made for it from the highest parts of the mold; the metal should he run in near or at the hottom of the mold. If about one pound of lead he added to every 16 pounds of old hrass, when just at the melting point, solid good hrasses will be the result. In melting old brass, the zinc, or lead, contained in it (when fluid) oxidizes freely, consequently the proportions of the metals are altered, and require an addition similar to the ahove. If the hrass has not heen recast, a little less lead will do, hut if recast several times, it may take the full quantity.

Rearing Sponges by Artificial Means.

During the past few years, Dr. Oscar Schmidt, Professor of Zoology, at the University of Gratz, and a well-known authority on sponges, has employed several weeks of the early summer in artificially producing and rearing the bath sponge. His labors have met with such success that his system has been adopted by the Austrian government, and is now carried out on the coast of Dalmatia. It has for some time been a well-known fact that several families of zoophytes have such great powers of reproduction, that a portion of one will grow aud form on an entire new body. Dr. Schmidt has taken advantage of this property, his process being to cut the sponge iuto pieces, fasten each portion to a pile, and immerse it in the sea. The pieces then grow, and eventually from each one a spherical sponge is obtained. According to the estimates of Dr. Schmidt, a small piece of sponge at the end of three years will represent a value of about 10 cents. The total cost of raising 4,000 sponges, including the interest on the expended capital for three years, is estimated at $45, and the income at about $80, leaving, therefore, a net profit of $35. There is no doubt that the practice of this new branch of industry will prove a source of considerable benefit to the inhabitants of the Idrian and Dalmatian coasts.

Waterproof Soles.—Waterproof soles which are either inserted into ordinary leather soles nr laid into the boot are prepared in Germany as follows: A mixture is prepared, consisting of 60 parts of rosin, 80 parts of tallow, 5 parts of wax, and 5 parts of turpentine. In this mixture linen is soaked. This is therehy rendered watertight. The sheet of linen is then united to a sheet of wool hy being passed through rollers. On the linen side the sole is now covered with a solution of glue, to prevent the resinous surface from sticking to the stockings and shoes in walking.

How to Distinguish Diamonds.—M. Rabinet, of the French Academy of Sciences, gives the following test for distinguishing colnrless gems from diamonds. If a person looks through a transparent stone at any small object, such as the point of a needle, nr a little hole in a card, and sees two small points, or two small holes, the stone is not a diamond. All white colorless gems, with tho exception of the diamond, make the object examined appear douhle; in other words, double refraction whenever exhibited by a stone, is conclusive proof that it is not a diamond.

Good Health.

"Modus Operandi" of Skin Grafting.

Pinch up a small amount of the cuticle from the inside of the arm with a small pair of forceps, and divide it with a small pair of concave scissors, being careful not to draw blood, and get the slip free from adipose tissue; insert this piece of skin into the granulations about one inch from the margin of the sore, and repeat in a similar manner until you have slips within an inch of one another all over the ahrasion. The size of tho piece of cuticle is uot so material; the object to be attained is to have it grow, and it can't take root unless it be buried into the ulcer. A piece of skin the size of a pin's head is large enough. When the grafts are all inserted, dress the sore with au artificial scah, made nf *adeps porci*, nine ounces, and thickened into a paste with English prepared chalk, twelve ounces, and spread over the sore and margins, retaining it there with a roller nr adhesive plaster. Let this dressing remain on for three days, then redress by removing this artificial scab, and wipe the sore with a soft clotb. Never use any water in dressing old sores, for it seems to make them take on those horrible nocturnal neuralgias the night following. Then remove your paste carefully and wipe dry; wherever a slip has taken you will notice a small depression at that point, and if you think advisable you can insert other grafts, and dress as before, and so on, until cicatrization is perfected.

How Long to Continue Transplanting.

Until the sore is studded full of grafts, and the ulcer, to all appearance, about well. If the sore is on the lower limb, quietude in the recumhent posture should he observed, and the leg elevated, as any pressure upon the ulcer at this time would cause most serious interference with the new granulations, as well as destroy the newly formed cuticle within the sore, which resemhles so many small islands in a hody of water; these little islands of skin will meet the skin from either side, and therehy hridge the ahrasion over. By carefully watching at this stage the new skin will become permanent, so that your patient may he allowed to go about. If the sore is on an upper extremity, the patient can have more liherty to go round. As regards the dietetic plan in these cases, as a general thing, the regimen should he articles of diet containing fat nitrogenized, and phosphatic combinations, together with milk and eggs. Stimulants should be avoided.—*Medical and Surgical Reporter.*

Antimony in the System.—It has lately heen estahlished that antimony, unless taken in extremely large doses, will quickly eliminate itself from the system.

The Progress of Dentistry.

Some hopeful results in the practice of dental grafting have been recently brought tn the notice of the French Academy by MM. David and Magitot. Two principal forms of such grafting are distinguished—tbe graft by restitution and the graft hy borrowing. In the former a tooth is reimplanted, after having beeu extracted with a view to certain operations, which would be impracticable in the mouth. M. David has adopted this method for rectifying the direction of teeth, for treatment of carics in the extracted tooth, for stopping and also for facilitating operation on another tooth, or in another part of the mouth. The consolidatiou of the tooth restored to its socket occurs generally on the tenth or twelfth day. In the graft by borrowing, a sound tooth may be substituted for a decayed nne. As regards transplantation from the lower animals, of course no zoological species has hitherto furnished teeth similar to ours in form, dimensions, color, etc. Still, sound roots (from a lower animal) may bo substituted for bad ones, and may serve as a solid hase for pivoted artificial teeth. Tbe transplantation from nne human heing to another would generally involve objectionable mutilation. But sound teeth may bo utilized for the graft when their extraction has become otherwise necessary. A tooth may he transposed from one part of the mouth to another. Practicing the dental graft by restitution, M. Magitot has operated in 62 cases, and 57 of these have been decided cures — a success amounting to 92%.—*Scientific American.*

The History of Diphtheria.—It is often said that diphtheria is of modern origin, a penalty for the unsauitary condition of modern civilization. Dr. Mackenzie, senior physician to the Hospital for Throat and Chest Diseases, in London, finds the disease to he a very ancient one. The first description of it occurs in the writings of an Indian physician, a contemporary of Pythagoras. He next identifies it with "askara," a fatal epidemic frequently mentioned in the Talmud. In the 17th century diphtheria was widely prevalent in Europe, and extensively fatal. In 1802 Dr. Cullen, of Edinburgh, seems to have described the disease under the name of *cynanche trachealis;* and in 1826 Bretonneau's classical work appeared. "After this," writes Dr. Mackenzie, "the disease seems to have passed from the minds of English physicians and its very existence to have been almost forgotten." From such forgetfulness the medical profession was thoroughly aroused hy the great epidemic of the years 1858-9, since which time diphtheria has not appeared in England with anything like the same malignancy.

Recuperating the Brain.—An intelligent writer on this subject thinks the use of stimulants to fortify tho exhausted brain an unwise measure. Tbe best possible thing, he says, for a man to do when he feels too weak to carry anything through is to go to bed and sleep as long as he can. This is the only recuperation of the brain power, the only actual recuperation of brain force; because during sleep the brain is in a state of rest, in a condition to receive appropriate particles of nutriment from the blood, which take the place of those which have been consumed hy previous labor, since the very act of thinking burns up solid particles, as every turn of the wheel or screw of the steamer is the result of consumption hy fire of the fuel in the furnace. The supply of consumed brain substance can only he had from nutritive particles in the blood, which were obtained from the food eaten previously, and the brain is so constituted tbat it can best receive and appropriate to itself those nutritive particles during the state of rest, of quietness and stillness of sleep.

Rest for Headaches.—Dr. Day says, in a late lecture: Whatever he the plan of treatment decided upon, rest is the first principle to inculcate in every severe headache. Rest, which the husy man and the anxious mother cannot obtain so long as they can manage to keep about, is one of the first remedies for every headache, and we should never cease to enforce it. The hrain, when excited, as much needs quiet and repose as a fractured limh or an inflamed eye, and it is ohvious that the chances of shortening the seizure and arresting the pain will depend on our power to have this carried out effectually. It is a practical lesson to he kept steadily in view, in that there may lurk behind a simple headache some lesion of unknown magnitude which may remain stationary if quietude can he maintained. There is a point worth attending to in the treatment of all headaches. See that the head it elevated at night, and the pillow hard; for, if it he soft, the head sinks into it and hecomes hot, which with some people is enough to provoke an attack in the morning if sleep has heen long and heavy.

Hot Water vs. Fever Germs.—According to Dr. Richardson, hot water at 120° Fah. will kill typhus germs, and soap acts as a poison to them. The remedy against typhus, then, is to he found in every household, and more's the pity if it he not applied. Considering the deadly nature of this fever, and the fact that 50,000 typhus germs will thrive in a space no bigger than a pin's head, it is clear, the *Christian at Work* thinks, that in such a matter, a quart of prevention is worth several hogsheads of cure.

MINING AND SCIENTIFIC PRESS.

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The Week.

The termination of the mining debris case has caused much quiet talk among miuing men, for in view of the decision rendered, unless new means of disposing of tailings are inveuted, hydraulic mining iu California must virtually cease. An interesting review of the subject will he found in another column.

The late heavy rains bave occasioned local floods in many parts of the State. Napa City was partially under water, and some regions of Sonoma county have heen overflowed. Humboldt reports large tracts submerged, and along the line of railroad nortb of Sacramento, the breaks and washouts have heeu so serious and extensive as to prevent travel and traffic for some days. The improved outlook for the season is leading to hrisker movement in the shipment of wheat, and quite a number of the idle merchant vessels lying iu the harhor have been put under charter since the last rain. The Darien sbip canal project bas again heen revived, and an international consultation as to its feasibility will soon be held at Paris.

Europe seems out of sorts. Bismarck is in bad temper over the failure of his Parliamentary restriction bill, and tbreatens to dissolve the Reichstag altogether. France is still exercised over ministerial troubles and the discovery of treasonable plots by the former Rochebonet ministry against the republic. Eugland suffers from want among the laboring classes, Russia is still sick with the plague, and Hungary is devastated by an extensive flood, which has destroyed many lives and a large amount of property.

Temporary Openings in the Mines.

By reason of the frequent and heavy rains that have fallen the past two weeks, the rivers and gulches throughout the mining districts of California are everywhere running full of water. Even the small gulches, that in ordiuary seasons remain dry or nearly so, througb the winter, are, at this time, swollen into rivulets. With this free and abundant supply of water, it is possible now to profitably work many gold-hearing localities that can only be worked under the conditions that at present exist. These localities, which are neither few nor of limited extent, can he found in every mining county along the main gold helt of the State. They bave not, as a general thing, heen reduced to ownership, and are, therefore, open to occupancy hy whoever may choose to take them up. As the city is full of idle men, and men glad to work for a dollar a day, these unoccupied and unclaimed diggings would seem to bold out good inducements for this class to go and try their hands at working them. It is an easy matter to reach these points, unless the extreme nortbern parts of the State should he selected for the field of operations, and where they could not for the present he prosecuted with as much comfort and success as in the more central and accessible counties. The most eligihle sites for carrying on this style of mining, until such time as the winter is well over, will probahly he found along the foothills from Mariposa to Plumas, where they occur in a scattered way over a strip of country varying from 15 to 20 miles in width.

As the most of these spots have been hut little worked and in some instances not at all; tolerahly fair, and sometimes very large wages can be realized working them while the water lasts. As a good deal of snow has fallen on the mountains above, the water supply may he expected to hold out here for several months, its continuance varying greatly in different localities. The cost of out-fitting a claim iu these extemporized diggings is not large, the dirt heing run off through the ordinary hox sluice and sometimes hy ground sluicing. The miner need not here make such extensive provisiou for housing aud subsisting himself as is required where operations go on without interruption and a permanent residence is to be made in the mines. Generally, he will be able to ohtain board and lodging at some farm-house or inu near by, enabling him to dispense with the cost of a cooking outfit and the huilding of a cabiu. To work this class of placers scarcely any other tools than picks, shovels aud crowhars are required. A few hundred feet of rough timber suffices for the necessary sluices, which the miner can himself cut and nail together. If to these there he added a flask of quicksilver, with, perhaps, some pierced sheet-iron and silver-coated copper plates, he will find himself amply equipped for service, these latter being hy no means indispeusable and very often wholly superfluous.

In going into the mining districts on an errand of this kind the prospector is not apt to meet with rebuffs from old settlers. On the contrary, he is generally welcomed and directed to the most likely places for furthering his objects. Information is almost always cheerfully imparted to bim, and if he seems the right sort of a man, more substantial aid will he extended to him should he require it. Not very often does the resident population, who have more steadily paying claims or other occupations to engage their attention, care to work this class of diggings. They have, therefore, no object in concealing their whereabouts, nor preventing others from taking them up and turning them to some practical account. Not infrequently it is to their interest to have this done, the farmer, the storekeeper, and others in the neighborhood finding in these new arrivals good customers. Having found and secured a paying claim of this kind, it does not follow that the locator need, at the end of the water season, ahandon it; neither work nor occupancy in these cases heing under the local law exacted so long as there is no water for active operations. It might be well worth wbile for workingmen who are seeking employment or desirous of employing themselves, to consider this matter, making more full inquiry in regard to it and acting accordingly. Tbese are diggings in wbich small companies of four or five men could work to advantage. That number might, therefore, combine, and, though tbeir individual means be limited, he ahle to raise enough to carry them into tbe mines and set them to work on joint account. This would be much hetter than remaining in the city idle, and hetter, perhaps, in most cases than accepting the poor pittance of $1 a day, with no certainty of employment at that.

From 50,000 to 60,000 camels are used in the transportation of 10,000 troops in Northern India, and the service has occasioned great mortality among the animals.

Near Brantford, Ont., lately, an acre of ground suddenly dropped a distauce of 40 feet helow the surface, leaving the side perpendicular.

A new canal is being constructed in the northern part of Kern county. It is to be 80 feet across the bottom and 7 feet deep.

The Debris Case—Injunction Granted Against the Miners.

The first step towards reaching a final decision in the case brougbt hy the farmers of Sutter and Yuha couuties agaiust certain classes of miners, has been taken. This was an action in equity hrought nearly two years ago hy the plaintiffs in the Tenth Judicial district of this State, to restrain the hydraulic and drift miners who discharge tbeir tailings into Bear river and the various creeks and ravines tributary thereto, from further using the same for this purpose. The reasons assigned for asking this restriction were that these tailings, which consist of sand, gravel and muddy water, had already caused great injury to mucb of the bottom lands lying along and adjaceut to the several streams tbrough which they found outlet, and which injury, heing continuous, would, if suffered to go on, be likely to so increase hereafter as to render large portions of these lands worthless for the purposes of cultivation. Prior to the commencement of these proceedings, the farmers had sought relief at the hands of the State Legislature, in which hody the matter was extensively discussed but no defiuite results were reached. The parties aggrieved then formed an association aud brought this suit throughb and in the uame of one of its members, James H. Keys, who appears as the sole plaintiff therein.

The miners, making commou cause, proceeded also to form an association for resisting this suit so hrought against them; and in answering the complaint sought to have the hearing thereof transferred from Sutter, a purely agricultural, to some other county; which application having beeu denied hy Judge Keyser, occupying the bench of the Tenth Judicial district, the case came on last July before him for hearing, hoth parties bcing represented hy ahle lawyers. By the plaintiff, George Cadwalader, P. Van Clief and J. H. Craddock were employed; Samuel M. Wilson, W. C. Belcher, A. B. Dibble and James R. Byrue appearing for the defendants, the latter composed of some twenty different hydraulic and drift mining companies operating along Bear river and its tributaries, and using the same for the receptiou of their tailings.

eral weeks, a great number of witnesses were

Iu the hearing of the case, which occupied sev-examined on both sides, some of them being among the ahlest engineers and scieutists ou the coast. A large amouut of testimouy was taken, much of it hearing on the question at issue only in a general way, and not a little of the evidence adduced heing of a very conflicting character. The plaintiff showed that he was tbe owuer of and held under a United States patent 1,069 acres of rich alluvial lands lying on Bear river, some 50 miles below the mines, and upon which he had expeuded $10,000 in improvements; that on the 15th day of January, 1875, 400 acres of these lands were covered to a depth varying from three inches to three feet with the tailings or debris from the defeudant's miues, which deposit was further increased in March of the following year: that this land was thereby rendered unfit for cultivation during the year of the overflow and the succeeding year, its productive capacity heing, in fact, permanently injured: that the accumulatiou of this sediment made it necessary for him to expend further large sums in raising his fences and huildings, constructing levees, etc., and that the water in Bear river, which was formerly clear and wholesome, had by reason of the sediment so run into it heen rendered muddy, and unfit for irrigation, the use of animals and for other domestic purposes.

The testimony tending to estahlish the above points was comhatted hy that introduced on the part of the defense; who, by an equally large number of witnesses, attempted to show that the land so overflowed instead of heiug permanently injured would in the end he greatly benefited therehy; that the harm in no case was more than temporary; that the cultivation of the lands above and which had their drainage into Bear river and its confluents, had caused a large portion of the sediment complained of aud would in the future send into these receiving channels a greater amount of this sediment than would he contributed by the mines, from which the quantity contributed would hereafter be diminished rather than increased; the defendants claiming that, in any event, they were entitled to continue the use of these various outlets to their mines, basing the same on prescription and prior right, as well as upon statutory and equitable grounds.

The testimony of hotb parties having heen taken, the case was last month argued before Judge Keyser by their respective attorneys and submitted for decision, hoth as regards matters of fact and conclusions of law, this heing a case in equity and determined without a jury. The findings of the court have just beeu filed, and are to tbe effect that the grievances complained of by the plaiutiff are well founded, entitling him to tbe relief asked for, to which end the court has issued an injunction perpetually enjoining and restraining the defendants from using the hed of Bear river, or any of its tributary ravines or gulches, as a place of deposit or dump for the debris from their mines—also prohihiting them from further corrupting and fouling tbe water flowing through any of these channels, the plaintiff heing given costs of his suit.

Counsel for the defendants, upon being advised of the ahove result, immediately applied for and obtained a stay of proceedings for 30 days, during which time measures will he taken for appealing the case to the Supreme Court of California. After this trihunal shall have passed upon it, whatever their decision may be, it will, as a matter of course, he taken on writ of error to the Supreme Court of the United States for final adjndication. Meantime the miners will, no douht, execute a hond indemnifying the plaintiff for any further injury they may cause him, in case the findings of Judge Keyser should he ultimately sustained, and proceed with their mining operations as before. These operations will not for the preseut suffer even temporary intermission.

While this suit was brought nominally by a single plaintiff, and the parties made defendant were confined to a few mining companies along Bear river, the damage complained of heing comparatively trifling and restricted to a single locality, the proceeding was, at the same time, largely representative, being regarded hy both the farmers and the miners in certain districts as a test case, whereby the question here in issue was to he finally settled and disposed of. In this view of the matter, this case becomes one of interest and importance, hoth in a legal and pecuniary point of view. As the farming lands affected by this debris are not confined to the valley of Bear river, so, also, are the mining companies to he affected by this decision of Judge Keyser not confined to the defendants in this suit. A considerable extent of bottom lands along the Yuha, with some also on Feather river, have beeu covered with these mining tailings and are exposed to he further covered thereby, the same as those along Bear river. As a consequence, the mine owners whose tailings find their way into these streams are liable to he hy legal process restrained from further use of the same equally with those operating along Bear river. Hence, there arises on hoth sides a hroad community of interests in this question.

It is to he observed, however, that the interests, hoth agricultural and mining, are comparatively limited and local, the only properties and callings seriously affected heing tbose of the land and miue owners along tbe three streams mentioned. There has not heen, nor is there likely to he, much complaint on account of injury sustained hy this mining debris elsewhere in the State. This narrows down the question considerahly, raising a hope that it may he possible to adjust it in such manner that no irreparable or even very grievous injury will result to either party. Suppose, for instance, the findings of Judge Keyser should he confirmed in the court of last resort. Could not the miners, who are not asked to make restitution for past damages, combine their means and purchase theso lands, so alleged to he injured and exposed to injury, at an appraised valuation, and hy a system of levying, gradually reclaim them in whole or in part, or hold them until such time as these hottoms through the accumulations of this debris would he so raised and spread out that the streams running through them would make for themselves channels sufficiently broad and deep to carry the muddy water and sand without overflowing their hanks.

This policy, or one involviug its main features, has been adopted at least in one instance and found to work well. The Spring Valley Company, operating a large hydraulic claim at Cherokee, Butte county, after heating the plaintiff in a suit brought against them, as a means of preventing further annoyance, concluded to huy all the farming land along Dry creek, the outlet to their mine, which they proceeded to do, the quantity purchased amounting to 16,000 acres. Through a sort of combined system of leveeing and irrigation tbey have succeeded in increasing the value of this land since it came into their possession from two to three hundred per cent., making the investment a very profitable one, and relieving themselves against the threat of further litigation at the same time. Should the adoption of tbis plan or something like it he found expedient, a part of this muddy water could be advantageously used for irrigating these hottom lands, while a much larger portion could in like manner be disposed of on the dry plains aud prairies adjacent thereto.

So, on the other hand, should the final decision of this question he adverse to the farmers, they, by uniting their means, might be ahle to divert much of this water from the bed of the streams where it now flows and employ it in the manner above suggested. Whichever party may in the end he left to deal witb this vexatious and troublesome question, may well bope to receive some aid from the State to help them in disposing of it. The extensive tule lands lying along the lower portions of these rivers would afford ample and desirable receptacles for all this mining debris could it he conducted upon them, and that the question of so disposing of this material will shortly take the shape of a practical engiucering problem may reasonably be expected. Rather than see these gold-producing sources cut off, should such result become imminent, the general government would no doubt feel constrained to use its best efforts towards helping to control this debris and carry it upon the great swamps where it is so much needed. In no aspect of the case need we despair of seeing this trouble successfully grappled with and such disposition made of it as will prevent its working any large interest, whether public or private, a serious detriment.

California State Geological Society.

Wall Rocks of the Bodie Auriferous Lodes.

At a regular meeting of the Society, held March 4th, 1879, Melvillo Attwood, F. G. S., read the following paper "On the Wall Rocks of the Bodie Auriferous Lodes:"

To a friend who was aware that I had devoted a very large portion of my time during the past 12 years to the study of rocks enclosing different metalliferous deposits, I am indebted for a collection of 100 specimens of the wall rocks and vein-stones of the principal lodes in the Bodie district.

I have made as careful an examination of the collection as my time and the means at my disposal would allow, and now beg to submit to you, as briefly as possible, the results; but before doing so I wish to state, with regret, that in consequence of ill health I have not been able to visit the Bodie mines, but from all the information I can obtain—by mill returns, reports of the different Superintendents, and by conversation with experienced mining engineers, who have thoroughly inspected the mines—I have every reason to believe that the lodes of Bodie, so far as developed, exceed in richness and extent those of any other district yet discovered in California. For instance, to the best of my recollection, the richest gold rock ever milled at Grass Valley, in any quantity, was taken out of the Allison Ranch mine in 1856, and treated at the Gold Hill mill, then under my charge. The parcel consisted of 21 tons, and yielded at the rate of $375 to the ton.

Some of the richest and most extensive lodes at Grass Valley (the Gold Hill lode for example) were abandoned at 250 feet; a depth at which the Bodie lodes appear only to begin to develop their richness. To give you some idea of the extent of the Gold Hill lode, the croppings can be traced from near the town of Grass Valley to New York hill. They can be seen passing around the head of Rhode Island ravine, over the summit of Gold Hill, and to the west of the residence of the late William Watt; then by the head of Scadden's flat, under where Joseph Woodworth's cabin stood, on to Massachusetts hill, and then following the contour of that hill on to New York hill, very little short of a mile. Underground workings have been made connecting with one another from the head of Rhode Island ravine to Massachusetts hill, and for a considerable distance on the way to New York hill. The underlie of the lode varies with the slope, or inclination of the surface of the ground, the most productive part of the lode being at a depth of from 60 to 120 feet. The red dirt near the croppings of the lode was worked in the different quartz mills and paid largely in 1853 and 1854.

The mode I adopted for the determination of this collection, was first to cut three or four sections, of different degrees of thickness, from each piece of rock, to be used for microscopic inspection; the thicker sections to show color and structure. The thinner sections were used for examination by polarized light. Besides which I prepared one side of each specimen after my new plan, to be viewed by reflected light, with the aid of a common magnifier; photographs taken from the prepared side or face and magnified three or four diameters will, in most cases, show at a glance the character of the rock. I do not think it necessary to give you a detailed description of the microscopic structure of each specimen, so will only state the general conclusions I have arrived at after a careful study of the collection.

I find them all to be volcanic rocks, belonging mostly to the trachyte group; many of them, as shown by the particles of kaolinized feldspar, having been subjected to a large amount of alteration.

Specimens from the Tioga shaft and tunnel so closely resemble the so-called "trachyte amphibole andesite" of Wolkenburg in the Siebengebirge, that the sections and prepared rocks, when placed beside those from Siebengebirge in my private collection, can hardly be distinguished one from the other.

Rock marked "porphyry," from the Syndicate tunnel, is also identical with some of the other Siebengebirge trachytes. A piece of rock from a crossent in the Belvidere mine has the enamel-like appearance of rhyolite.

The specimen marked "hird's-eye porphyry," from the Belvidere, is a "trachytic diorite," and of much the same character and appearance as that of the Comstock rocks, but has not undergone the same amount of alteration. Some of the feldspar crystals have enclosures or microlites of a pyroxenic mineral.

The prepared rock with the section cut from it and marked "A," was found mixed with the vein-stone at a depth of 1,700 feet in one of the Gold Hill mines (Washoe); and the rock and section marked "B" is from the Belvidere mine, Bodie. Compare them and you will see that they are much of the same character and structure. Years ago the Comstock miners applied the term "bird's-eye porphyry" to *country rock*, found mixed with the vein matter, and which, by solfatara action, or some other cause, had been so altered that it contained 80% of silica, and the particles of feldspar so kaoliuized as to lose all their crystalline form, and take the shape of rounded spots, of a whitish color; hence the name.

The Mount Davidson diorite, was for a long time termed syenite. The black dyke, a dolerite, was called "andesite," and the "trachytic diorite," a rock, the proportion of silicia in which, being too large to be classed with the basic, and too small for the acidic group of igneous rocks forms one of the intermediate links between the two. It went by the name of "porphyry,"—"feldspathic porphyry," "hornblende porphyry." Baron Richtbofen named it "propylite." The Comstock lode was also called a true *fissure* vein, with syenite on one side and a *clay* wall on the other. Rocks sent me from some of the deep workings at the Virginia end of the Comstock, both east and west of the ore bodies, show that whatever the rocks might have been near the surface, or in the upper workings, they have imperceptibly merged into and become rocks of the same basic character as the Mount Davidson diorite.

It is generally admitted by geologists that metalliferous veins or lodes (I prefer the Anglo-Saxon word, lode) are of *aqueous* origin, and that the metalliferous matter occupying *portions* of previously existing fissures, was introduced through such agency; and, thanks to the microscope for its aid in removing all doubts on this subject, as the inspection of vein-matter by it, shows immediately that it possesses certain definite structural characters distinguishing it from the enclosing rock. The arrangement due to successive depositions of minerals on the side of a fissure sometimes gives the vein-matter the appearance of a sedimentary rock.

The *Philosophical Magazine* for December, 1871, published a paper written by John A. Phillips, E. C. S., "On the connection of certain phenomena with the origin of mineral veins," wherein he says: "In the present state of our knowledge we are unable to explain all the various phenomena which we have observed in connection with the origin, composition, structure and mineral constitution of veins; but a careful consideration of ascertained facts would appear to lead to certain general conclusions, forming a sort of skeleton map, of which the details remain to be filled in by the aid of further research.

"First: Metalliferous lodes are more numerous and productive in the vicinity of igneous rocks than elsewhere.

"Secondly: There is abundant evidence of volcanic eruptions having taken place during all periods of geological time.

"Thirdly: Solfatara action and thermal springs are often the latest active evidences of volcanic disturbance.

"Lastly: Crystalline quartz, iron pyrites, sulphide of mercury and various other minerals are at the present time being deposited by solfatara action, in veins possessing many of the characteristics of ordinary lodes."

Again he says: "At the 'Sulphur Bank,' on the shores of Clear Lake, California, is a solfatara some six or seven acres in extent, where a much decomposed volcanic rock is traversed by innumerable fissures, from which steam, together with carbonic and horacic acids, is continually issuing. Sulphur is deposited on the sides of the crevices; and gelatinous silica is found coating chalcedony and opalescent silica in various stages of formation, from the gelatinous state to that of the hardest opal. This indurated silica is sometimes nearly colorless, but is more frequently permeated by cinnabar and iron pyrites, or blackened by a tarry hydrocarbon. Cinnabar is also found in striæ and occasionally in veins, as well as in concretionary masses of considerable size.

"Section of chalcedony and semi-opal from this place, when examined under the microscope are often found to enclose crystals of pyrites together with crystalline cinnabar, although the latter mineral has generally been deposited in an amorphous state. A specimen of chalcedony taken from one of the fissures in the Sulphur Bank, which on being first broken was exteriorly so soft as readily to receive an impression of the nail, had on reaching this country become hardened, and had assumed the ordinary characteristics of that mineral. Thin sections of this specimen show a structure resembling fine-grained fortification agate, and are traversed by numerous fissures filled by opaque oxide of iron. Fig. 2 is intended to show the appearance of a section of this substance magnified 30 diameters. When examined between crossed prisms, brilliant colors are obtained, and the crystalline structure becomes exceedingly distinct."

The two specimens and sections which I have brought for your inspection, are made of the same character as those described by M. Phillips—one marked *C*, is vein-stone from one of the Bodie mines, and the other, marked *D*, from a solfatara in Lake county. Mixed with the vein-stone from the Dudley mine, Bodie, are stains of cinnabar.

To those who feel interested in this subject, I recommend the perusal of Mr. R. Daintree's paper "On Certain Modes of Occurrence of Gold in Australia," published in "Quarterly Journal of the Geological Society," August, 1878.

With regard to the time of introduction of gold into the rocks of California, I think all evidence goes to show that it occurred at two very distinct geological epochs. The wall rocks of the auriferous lodes of Grass Valley, for instance, are for the most part composed of diorites, or diabases-basic plutonic rocks, and the gold met with in those rocks must have been formed during the *first* or earliest age. On the other hand, the closing rocks of the auriferous lodes of the Bodie district, are acidic volcanic rocks, and belong to the trachyte group. Consequently the gold in those lodes must be of a later or secondary age. During the volcanic period the deep placers, or ancient rivers, with the gold of the *first* age mixed with the gravel in these beds, were covered over to a depth of many hundreds of feet by volcanic ash, basalt, trachyte and other mineral volcanic products, their courses were changed, and the ancient Yuba, before the volcanic periods, is now at a much higher level than the present Yuba.

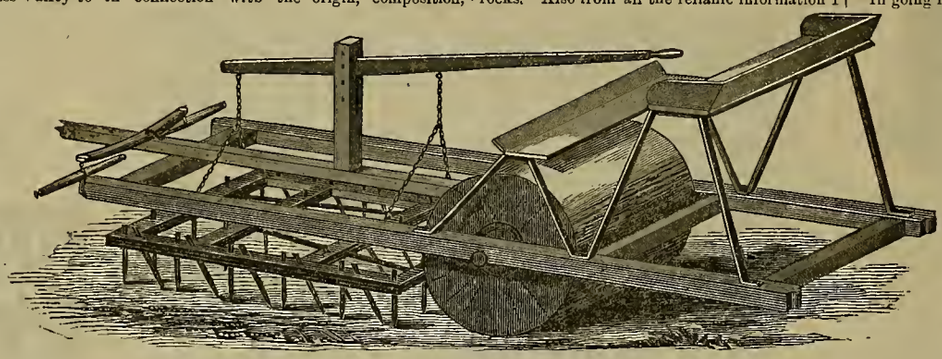
The gold of the Bodie shallow placers and lodes, must have been introduced subsequent to the volcanic period.

Conclusion.

I have briefly stated to you the results of my examination of the collection sent to me, and from it I am of opinion that the Bodie lodes are undoubtedly of aqueous origin, and that the rocks encasing them are all igneous—volcanic rocks. Also from all the reliable information I can obtain, gold has been found in paying quantities at greater depths in those rocks than in the older or plutonic ones. The gold in volcanic rocks is generally adulterated, or higly argentiferous. Mineralized silver is also found in more or less quantities, mixed with the vein-matter.

I have heard from good authority that a large parcel of between 900 and 1,000 tons of vein-stone was taken from the Bodie mine and averaged in gold upwards of $600 to the ton. This would be the richest rock in quantity that I ever remember seeing taken out of any California mine.

I do not hold any shares in any mine either in California or Nevada, neither am I interested directly or indirectly in any of them, and my sole object in addressing you is in hopes that it may be the means of directing attention to the subject of wall rocks, and thereby cause others to work in this comparatively unexplored field. The application of the microscope in these investigations is, however, absolutely necessary, and I am in hopes the day is now past when such remarks as that "mountains should not be looked at through microscopes" will not be listened to by any intelligent person.



NEIL CAMPBELL'S COMBINED HARROW AND ROLLER.

Campbell's Combined Harrow and Roller

We illustrate on this page an improved combined harrow and roller, invented by Neil Campbell, of Ætna, Siskiyou county. The frame work is made large enough for both harrow and roller. The roller is formed of a solid log with bands of iron around it, the spindle being journaled to it in the ordinary way. On the cross bar behind the roller is placed a strip of iron, which acts as a scraper and keeps the roller clean.

The harrow is formed of four cross bars and longitudinal binding pieces. As many lines are drawn across these cross pieces as there are lines of teeth in the harrow. The teeth are then inserted on each alternate line until the harrow is full, and then the remaining lines are filled on each bar alternately, one-half the teeth being placed so as to stand at an angle of 45°, as shown. This method of placing the teeth causes them to stand far apart at the points, although within an inch and a half of each other.

Two iron bars pass through the harrow, to which is secured a chain, the other end of which is hooked to the under side of the pole, thus answering as a draft chain.

Immediately above the harrow and bolted to the pole is a standard or post. Slots are made through this post and a pin passes through them to hold the lever in any desired position.

From this lever extend downwards two chains, one connecting with each end of the harrow, as shown. The driver, from his seat in the rear, by pulling down on the rear end of the lever, raises the front end of the harrow by means of the chain; or can by similar means depress the front end and raise the rear end, as desired. In this way the harrow can always easily be cleaned from rubbish or weeds.

In going from one field to another the harrow can be raised entirely from the ground by putting a small piece of wood, which may be kept always at hand on the seat, under one end of the lever and by raising up, the harrow is suspended from the chains above the ground. A stay chain from the frame to the double-tree takes the strain off the pole in turning. The horses can be hitched ahead or otherwise, four in number or six, according to the size of the machine.

In this way the harrow and roller are combined for cultivating the ground and the harrow so arranged that it is easily cleaned of weeds, and may be lifted off the ground in moving from one field to another. The driver can ride in using this harrow, the seat being placed at the rear end, so as to balance the pole, as shown.

Questions Answered.

In reply to inquiries from "Miner," of Bingham Canyon, Utah, we may say, we know of no *specific* for the prevention or cure of headache caused by inhaling the fumes of giant powder—that is, nothing taken internally will have that effect. Some miners claim that tobacco smoke has a tendency to that end, on the principle, we suppose, that one poison may sometimes be relied upon to counteract the effects of another. Dr. Blatchley of this city has invented and patented a plan which, where practicable, has been found effective for laying and rendering innocuous the fumes of giant powder. By this plan water is introduced into the place where blasting is going on through a pipe or hydrant ending in a closed and finely perforated nozzle, from which the water issues in a fine spray that is said to effect the end desired without fail.

By the manufacturers of giant powder or dynamite it is claimed that this substance will not explode at a temperature of less than 160° Farenheit. Where this occurs at a lower temperature, they attribute it to radiated heat, expressing a doubt about there being any well authenticated cases where this has happened.

There is no machine to be obtained on this coast for grinding small samples of ore, the mortar and pestle being mostly in use here for that purpose; iron discs with a flange about the edge being also used and well-liked by some. A small Blake's crusher, well adapted for use in an assay office, can be obtained in New York.

The Water-Making Snow.—The late storms have deposited a pretty good body of snow on the Sierra Nevada, thereby greatly improving the water supply prospects of the hydraulic mines. These snow falls that occur so late in the season, not becoming much impacted before the warm weather, melt rapidly, and therefore fail to prolong the water season, like those that come earlier in the winter. Still, there being so much of this late snow, it cannot fail to keep the mountain streams replenished pretty well into summer, thereby removing the fear entertained by the miners, that they should be left with a ruinously short water supply the coming spring.

Hope it is True.—Specials from Texas state that several Mexicans who were among the murderers of Judge Howard and Messrs. Atkinson and McBride, at San Elizario, have been arrested and put in jail. The numerous friends of Mr. Atkinson in California would be gratified to have this news confirmed.

Real estate has taken a start forward in New York.

Tempests and Snow Drifts.—The snow storm that commenced on the Sierra Nevada mountains last Saturday night was attended by a perfect hurricane, which whirled the falling particles into heaps that entirely covered many of the buildings and so obstructed the railroad track that it took the relief train, with all their enginery of snow plows, three days and nights to clear it sufficiently for trains to pass.

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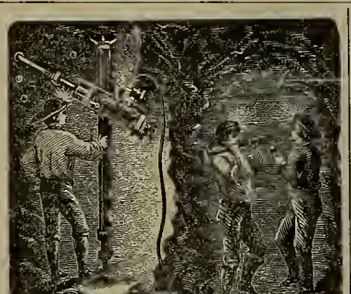

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DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHŒAL, or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

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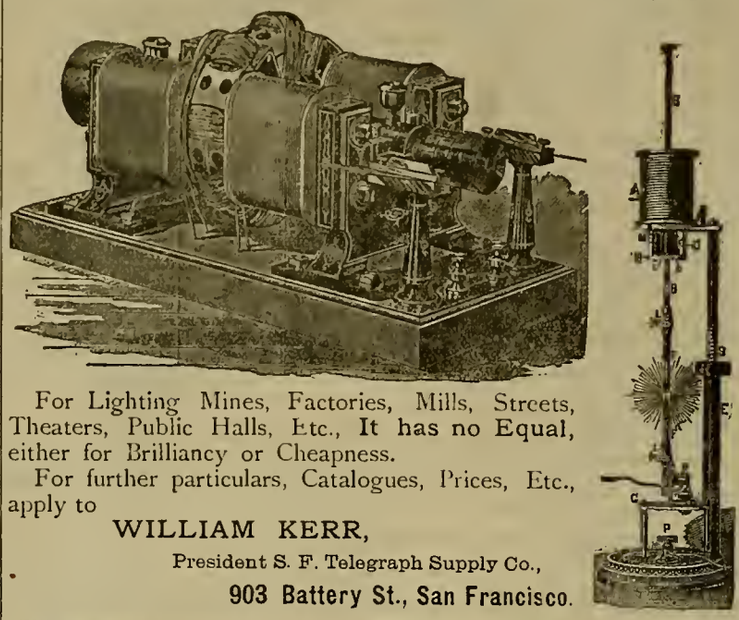

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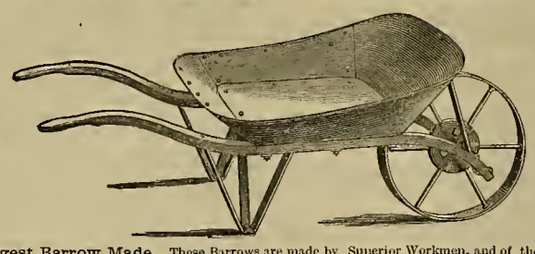

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[Continued from page 165.]

750 level shows more streaks of low grade ore than at any time yet. Crosscutting at that point will soon be in order. The south lateral drift on the same level is also showing improvement.

ALTA.—Good progress is being make in the double winze on the line with the Benton. No change in the north drift 1550 level, which still skirts the ledge and follows the clay.

BELMONT DISTRICT.

BELMONT.—*Courier*, Mar. 1: All parts of the mine are without change during ths past week. Stopes are looking well and yielding an increased amount of pay ore. Ws have advanced south raise—north end of mine—since last report, 27 ft in a well-defined vein of quartz, assaying from $25 to $38 per ton. The ore assays a little more every foot advanced in hight, and will not be long before it will pay for mining and milling. Have also advanced 300 level drift 12 ft in hard blasting ground. Number tons of ore extracted for the week, 15; average assay, $96.

HIGHBRIDGE.—There is no change to note in the upper workings of the mine except in the extreme north stope, the ore is lower grade than formerly though it pays well for extracting and milling. Have advanced the drift on lower level north 17 ft, south, 18 feet. Hereafter shall make bullion shipments oftener on account of the stage not being able to carry at a trip so large an amount as has been previously shipped.

OILA.—There is no change to report in either the east crosscut or winze from it during the past week. In the former we have run 17 ft, and in the drift from the latter 21 ft, with nothing new developed in either. The stopes just started in the south drift are looking remarkably well; much better than was expected. A small force of men as yet have been at work upon it, but the number will be increased as soon as openings are made.

EUREKA DISTRICT.

THE RICHMOND MINE.—*Sentinel*, Mar. 8: This mine ships about 200 tons of ors daily. A large force is employed around the hoisting works, and everything has a lively and business-like appearance. The work progresses satisfactorily under Mr. Rickard's supervision, aided by Messrs. Sam. Longley and William Harris.

PHŒNIX.—The incline shaft is down about 150 ft, and the work is pushed forward rapidly. The giraffe in the incline is a large one, weighing about three tons, and could not work in a better manner. The usual force of men are employed under Pat Rositer as foreman and W. H. Davis as night boss.

JACKSON.—Everything is running smoothly and about 50 tons are shipped to the Metamoras daily, with every indication that the amount will be increased shortly. This amount, with what they buy at the furnace, keeps it running regularly. Mining men claim that at no distant day the Jackson will develop into one of the most valuable properties in the district.

THE K K.—The shaft is down to the 800 level, and they are now cutting out for the station at that level. The water is easily handled, the tank bringing up 800 gallons every four minutes when necessary. Prospecting on the upper levels continues as usual.

THE HAMBURG.—Superintendent Powell, in his weekly report, says the intermediate drift was run 17 ft during the week, and is now within 45 ft of the upraise from the end of the south drift on the 450 level. There is no special change to note in the size or quality of the vein of ore. The east crosscut of the 400 level has been continued 12 ft, making a total of 23 ft, with the face in clay and iron. The 600 level, west crosscut, has been advanced 19 ft, being a total of 169 ft from the main south drift, with face in vein matter. The south drift from the main crosscut has been advanced 18 ft, being a total of 107 ft, with no material change. The winze was sunk 10 ft, making a depth of 69 ft below the 600 level. The hoisting machinery at the mine is in good order and working well.

REESE RIVER DISTRICT.

MANHATTAN ITEMS—*Reveille*, Mar. 8: The ore body in the Curtis shaft, above the 517-west drift still holds good ore. The drift is being push ahead in order to open out a stope. The 560 stope has nearly reached the 517 drift on the top ledge. The bottom ledge though small, carries very rich ore and has been breasted up very little. The 825 stope is being opened along the level and continues to carry very high grade ore; but only a limited number of men can be worked on account of ventilation. Sinking the winze in the North Star shaft, 600 west drift, is making very good progress.

WESTERN NYE.—Grantsville *Sun*, Mar. 8: Specimens from the Ward mine are fairly aglow with ruby silver. There are now on the dump four tons, which will go $1,500 per ton; 16 tons, which will go $800 per ton. The vein so far varies from a few to 24 inches in thickness; depth of incline 700 ft. and perfectly dry, being drained by other mines on Lander hill. The Alexander mine is looking well. The ledge in the south tunnel, it is said, continues in high grade sulphurst ore. It has been penetrated a distance of 24 ft, and no sign of the banging wall yet. This find in the Alexander is daily adding value to the property.

SECRET CANYON DISTRICT.

IRISH AMBASSADOR.—*Sentinel*, Mar. 8: The mine is opened by an inclined shaft 140 ft in depth from the surface. A rich seam of ore continued all the way down for 100 ft. At this point it opens out from two to three ft wide and contains black metal. It looks as if it would assay in the neighborhood of $1,500. The shaft is being sunk through the hardest kind of dolomitic limestone. There are eight or ten tons of ore on the dump.

ARIZONA.

GLOBE.—*Silver Belt*, Feb. 24: A cave in the drift of the Washington is reported; nobody hurt. The vein in the Silver Queen drift, 120 ft deep, is found six ft wide, and is well defined. The quartz looks much better than in the drift 30 ft above. Work has been suspended on the mine, as Mr. Crane is about to leave for California. On his return work will be resumed. The ore worked from the Centennial mine at the Miami mill went very high. A piece of rich ore the other day was taken from the Stonewall Jackson shaft 260 ft down. It was a fine-grained quartz with silver sulphurets all through it. The ors in the Alice shaft has improved. Nodules and spots of rich black sulphurct are occur in the ordinary vein rock. An assay made recently went over $3,000 per ton, the piece of course being selected and freed from waste. Lieurance Bros. & Co. are working on the Mattie West lode, near the McCormick mine. There is a 20-ft shaft on the ledge. Some rich ors has been found in the croppings. Good ore is still being obtained from the Miami lode. The Buckeye shaft is 230 ft deep. The ore will go about $70 per ton. It is not known how large the vein is, but a crosscut will be run for the hanging wall. There has been some excitement at the Richmond basin over the re-location of the McDowell claim, which, it is said, had insufficient work done on it. The claim in question was the northwesterly extension of the Mack Morris mine and is, no doubt, valuable ground.

OTHER NOTES.—*Sentinel*, Mar. 1: Work on the Tiger mine has been prosecuted with vigor. The immense hoisting works are finished and in successful operation. The mill will be running by ths middle of May. A new shaft has been opened; it is now down 70 ft. There are over 500 tons of fine ore on ths dump. The company has spent already $120,000 on the mine and machinery. The ore is rich in sulphurets and free silver, and is very tractable. The Blackburn gold mine has its main shaft down over 90 ft, and sinking is being pushed night and day. Another rich mine has been discovered this week in the Papago country, by Dr. DeCorse and A. Contreras. It is just across the Mexican line. Considerable mining for placer gold has been done this winter by Mexicans, around the Ellen Gowan, Spruce, and Hemlock mines, in Montezuma district, near Castle Dome. These are copper mines, but carry considerable free, coarse gold, which is washed out of their debris.

News in Brief.

NAPA CITY is under water.

GERMANY is free from the cattle plague.

THERE is a glut of silver in Austro-Hungary.

THE late French Ministry is to be impeached.

A COPPER lode bas been found below Salinas.

QUEEN VICTORIA will soon visit the Continent.

THE Turkish troops entered Adrianople on tbe 12th.

THE scbooner *Alaska* is going north after whales.

SPOTTED typbus is prevalent at St. Petersburg.

THURSDAY, April 3d, will be fast day in Massachusetts.

THE Cabinet has appointed a National Board of Health.

FRANCE and Portugal are about to blockade Dahomey.

THERE is a famine in Bolivia, 8 to 10 persons dying daily.

FOURTEEN Gloucester fishing vessels are supposed to be lost.

THE remains of Bayard Taylor reacbed New York on the 12th.

ANOTHER prisoner escaped from the Stockton jail Saturday night.

OFFICIAL report states the plagne to be mastered in Russia.

COLUMBUS, Ohio, has to be patrolcd at night to prevent arson.

THE British have sustained anotber crushing defeat from the Zulus.

SHIFTING sandbars on the Sacramento, are giving steamers much trouble.

AUSTRALIA estimates that she has 10,000 citizens who need hanging.

THE Polytechnical Institution at London was destroyed hy fire Mar. 7th.

THE Zulus are commanded by experienced officers said to be Americans.

WATER from the Julia mine is now being pumped through the Sutro tunnel.

SONOMA, Napa and Mendocino counties are overrun with school teachers.

THE situation in upper Burmah is regarded very serious for European residents.

BISMARCK'S Parliamentary Discipline bill has been rejected in the Reichstag.

A FEARFUL wind and rainstorm has prevailed in Oregon for several days past.

THE city will ship 15 Chinese lepers to tbeir native land, by the next steamer.

THE Bank Commissiouers have finished with the city and now go to the country.

BOLIVIA is becoming the rival of Chile and Peru in the production of nitrate of soda.

IN the Morrisite massacre case at Salt Lake, the jury returned a verdict of not guilty.

SWITZERLAND is experiencing the hardest times she has seen in a quarter of a century.

AN internatioual congress has heen called at Paris to arrange for a ship canal across Darien.

THE Southern Pacific railroad track has reached a poiut 830 miles east of San Francisco.

THE Royalists in France are engaging in an active campaign in favor of a protective policy.

BISHOP BURTON, charged with tbe murder of the Morrisite Mrs. Bowman, has been acquitted.

DISPATCHES state that real estate is in more demand in New York than it has heen for years.

THE population of Djuma, Macedonia, is emigrating en masse before the advance of Turkish troops.

EIGHT persons were killed in the Victoria coal pit, Eugland, Saturday, by the fall of a cage.

THE first shipment of American iron ever made to China occurred at New York last week, 100 tons.

FEMALE suffrage has been rejected by the English House of Commons, by a vote of 217 to 103.

MANY persons were injured at North Berwick, Me., by the giving way of the floor of a public hall.

A GANG of swindlers in the East are obtaining subscriptions for a pretended memorial to Bayard Taylor.

IT is said that the ardent feeling in Dakota in favor of admission as a State has received a sudden chill.

THE Union Pacific has purchased tbe Kansas Pacific railroad, and the two will bereafter be operated as one.

SPOTTED TAIL'S Indians are becoming dissatisfied with their new location, and want to get back to the Missouri.

THE band which recently entered Thessaly from Greece have been dispersed by Turkish troops and several killed.

A MOVEMENT is on foot in tbis city for holding a woman's mass meeting in support of the new Constitution.

THE settlers on the Los Bolsas rancho, Santa Barbara county, spent $14,000 in litigation with the land company.

TEXAS expends from $150,000 to $200,000 annually to support a battalion of State troops for the protection of the frontier.

IN the mining debris case, at Wheatland, Judge Keyser has granted a perpetual injunction against the Little York mine.

THE body of policeman Chamberlain, wbo disappeared from Sacramento 10 months ago, bas been found in the Sacramento river.

THE Los Angeles Woolen mill reservoir, containing 100,000,000 gallons, hurst its dam on the 6th inst., flooding the lower portion of the city.

KEENE bas offered $10,000 reward for the detection of tbe person who forged his name to the dispatch in connection with tbe recent wbeat conspiracy.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING MARCH 4TH, 1879.

IMPROVEMENT IN SYSTEMS OF PUMPING AND COOLING—E. J. Molera and J. C. Cebrian, S. F.

QUARTZ-MILLS—D. H. Anderson, S. F.

MUSIC-LEAF TURNERS—O. H. Goodwin, S. F.

SEWING AND EMBROIDERING MACHINES—L. C. Mumford, S. F.

CORK-EXTRACTORS—L. C. Mumford, S. F.

METHOD AND APPARATUS FOR PHOTOGRAPHING OBJECTS IN MOTION—2 Patents—E. J. Muybridge, S. F.

WAVE-POWERS FOR PROPELLING VESSELS—J. B. Oreene, Elliott, Cal.

INSECTICIDES—J. C. Benton, Santa Barbara, Cal.

BED-BOTTOMS—W. H. Leininger, Salem, Ogn.

AMALGAMATORS—P. Dickson, Spearfish City, Dakota Ter.

SAUCES—Trademark—J. Lusk & Co., Oakland, Cal.

OINTMENTS—Trademark—J. L. Standart, Lemore, Cal.

——The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telgraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WINDING ATTACHMENT FOR CLOCKS.— S. Serighelli, San Francisco. This invention relates to an improved winding attachment for clocks, and consists in placing at any desired point under the floor at the main entrance of a building the works of a clock, which are so connected with a movable section of the floor that the weight of the persons passing over said floor section will depress it and thus wind up the spring which furnishes power to the clock movement. The dials may he placed at suitable points in different parts of the building, the one movement furnishing power to the various dials hy means of endless cords passing around the main drum, and thence through tubes and over and under small pulleys to the drum bebind the dials, which is mounted on the shaft carrying the hands. Small pulleys are enclosed at the corners, where the line of direction of the pipes through which the operating cords are led is changed. The cord operates without stopping, and any slack is automatically taken up. Measures are also taken to prevent over-winding. This device is a very ingenious one, and is especially adapted for large buildings where there are a number of clocks, as they can all be run by one movement and receive no care. Several of these are running in this city at present.

EXPANSION PULLEY.—S. Serighelli, S. F. This expansion pulley is used by Mr. Serigbelli in connection with his improved clock, but is adapted for all purposes for which pulleys are made, being specially useful for lathes, sewing machines, etc. The pulley is formed in sections, each of which has attached to it a staple or lug, which projects through a slot so as to come through a disk of metal. On the opposite side of this disk are springs corresponding in number to the sections of the pulley, and to each lug or each section is fastened one of the springs. The pulley sections are then eacb one attached to the disk by means of the lugs and springs; but the elongated slots admit of a certain amount of play to the lugs and sections outwardly from the center. The shaft on which the pulley is mounted is threaded and a cone is screwed on to it, so that when the cone is screwed up so as to enter a central slot it pushes the sections apart and increases the diameter of the pulley. This action brings a tension on the springs which hold the sections to the disk, and when the cone is screwed back the springs draw the sections together again and decrease the diameter of the pulley. This expansion pulley is very simple in construction and operation, and is especially useful in small machines for tigbtening belts, etc. Mr. Serighelli's address is 694 McAllister street, S. F.

RODENT EXTERMINATOR.—John C. Benton, Sauta Barbara. This invention relates to that class of compounds used for poisoning squirrels, gophers, rats and other rodents, and that which is new and valuable in it consists in the combination of poisons tbat will be immediately and surely effective, and so combined with other materials as to preserve the properties and powers of the poisons, and render them safe and convenient to handle and use, and, especially, rendering the compound so attractive to said rodents, tbat they will eagerly seek and eat it.

PROPELLING VESSELS.—James B. Green, Elliott, San Joaquin Co. This invention relates to an improved method of propelling vessels hy wave power, and tbe improvements consist in mounting upon timbers or frames projecting over the end of the vessel, a series of frames carrying movable buckets or paddles. These buckets are hinged at their forward ends and the after ends have a certain amount of vertical play. As the vessel rises and falls on the waves, the huckets automatically alter their angles, so that the power of the wave will force the vessel ahead. Means are provided for raising the frames, carrying the buckets out of the water when it is desired to stop their action.

The Mechanics' Institute Fair.

The Managers of the San Francisco Mechanics' Institute have begun preparations for their annual industrial exhibition. The date has been fixed for opening, August 9th, and for closing, September 6th. At the annual meeting held this week, Irving M. Scott, President, made a few remarks preparatory to presenting his report. He stated that during the last quarter the officers of the Institute had been busy attending to the affairs under their charge, and although the library room was inadequate to hold the hooks now in it, they had concluded to postpone contemplated improvements until after the next exhibition. The building was in good condition, and only required a few alterations to make it answer every purpose. He then gave the condition of the various funds of the Institute and other matters of interest, as follows: Library room and building fund, $890.01; pavilion fund, $267.48; sinking fund, $782.34; total on hand March 1st, 1879, $1,939.83. During the year 644 persons have joined the Institute, beiug au average of 53 each month. At present there are 1,711 members, a gain of 61; life members 142, a loss of 6; honorary members 5, a loss of 1; total membership on March 1st, 1,858. During the year 1,886 new volumes have been added to the library—an average of 157 each month; and the circulation for the same time was 65,302 volumes—an average of 5,441 per month.

D. A. McDonald, Vice-President of the Institute, was then introduced, and made a short speech, in which he congratulated tbe members on the prosperity of the Society, and the harmony and good feeling that prevailed at the meeting.

After the returns of the election for Trustees, on the 3d instaut, had been read, Irving M. Scott, Columbus Waterhouse, A. D. Fish, Nathaniel Hunter, A. W. Starbird, James Drury and F. A. Frank, the Board of Trustees elect, took the oath of office, and the meeting adjourned.

New Incorporations.

ORIENT AND OCCIDENT O. & S. M. Co.—Object: To mine in Mexico. Capital, $10,000,000. Directors—L. B. Clark, W. A. Roberts, D. W. Donthitt, F. MacCrellish, R. R. Clark, W. P. Edwards, Jr. and J. S. Jefferies.

GREAT REPUBLIC G. M. Co.—Capital, $10,000,000. Trustees—W. H. Harper, John H. Collins, George W. Smith, Frank Tippets and Charles Jost.

NOONDAY CON. M. Co.—Capital, $10,000,000. Directors—R C. Hooker, George B. Root, William B. Carr, William J. Taylor and O. A. Holden.

PACIFIC COAST OIL Co.—Object: To deal in oils and oil lands. Capital, $1,000,000. Directors—Charles N. Felton, L. D. Fisk, George Loomis, George W. Heges and E. H. Forester.

NEVADA COUNTY CON. PLACER M. Co.—Capital, $12,500,000. Directors—E. Derbec, J. T. Morgan, N. P. Brown, E. M. Preston, E. Hamilton, A. Nivens, Jr. and John Pattison.

OMEGA BLUE GRAVEL M. Co.—Capital, $12,500,000. Directors—E. Derbec, J. T. Morgan, N. P. Brown, E. M. Preston, E. Hamilton, A. Nivens, Jr. and John Pattison.

ALPHA BLUE GRAVEL M. Co.—Capital, $12,500,000. Directors—E. Derbec, J. T. Morgan, N. P. Brown, E. M. Preston, E. Hamilton, A. Nivens, Jr. and John Pattison.

GREAT WASHINGTON BLUE GRAVEL M. Co.—Capital, $12,500,000. Directors—E. Derbec, J. T. Morgan, N. P. Brown, E. M. Preston, E. Hamilton, A. Nivens, Jr. and John Pattison.

IRON CAP M. Co.—Object: To operate in California and Arizona. Capital, $10,000,000. Directors—W. Sherman, O. F. Willey, J. A. Robinson, J. R. Larpham and F. H. Horton.

HARTFORD S. M. Co.—Object: To operate in Inyo county, Cal. Capital. $10,000,000. Directors—P. B. Howard, George S. Burnett, M. F. Dailey, B. W. Mudge and W. R. Carton.

OREEN MOUNTAIN M. Co.—Capital, $1,350,000 Directors—H. C. Bidwell, Ivan Prowwattain, R. E. Brewster, P. H. Knauer and E V. Joice.

MORGAN GRAVEL M. Co.—Capital, $300,000. Directors—R. L. S. Hall, William Sherman, D. A. Bennett, R. M. Anthony and D. W. C. Morgan.

LEFLER M. Co.—Object: To operate in Nevada. Capital, $5,000,000. Directors—William Dunphy, W. H. Sharp, Peter Lefler, J. L. King and J. P. Sargent.

OOLDEN STATE CON. M. Co.—Object: To operate in Amador county, Cal. Capital, $5,000,000. Directors—Charles W. Badger, Wingate P. Sargent, Sidney Sargent, Edward B. Partridge and George W. Bibbsns.

BROOKLYN CON. M. Co.—Object: To operate in Bodie district, Cal. Capital, $10,000,000. Directors—W. K. Leveridge, E. S. Noyes, Thomas Wallace, I. M. Menill and John F. McGeoghegan.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

ANY person receiving this paper after giving an order to stop it, may know that such order has failed to reach us, so that the paper is continued inadvertently, and they are earnestly requested to send written notice direct to us. We aim to stop the paper promptly when it is ordered dis continued.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., March 12, 1879.

BAGS—Jobbing.

Rag Standard Wheat	9 @ 9½
Neville & Co.	
Hand Sewed, 22x36	9 @ 9½
24x36	—@—
23x40	11 @—
Machine Swd, 22x36	9 @ 9½
Flour Sacks, halves	8½@10
Quarters	5 @ 6½
Eighths	3½@ 4
Hessian, 60 inch	13 @14
45 inch	8 @ 9
40 inch	7½@ 8
Wool Sacks,	
Hand Sewed, 3½ lb	46 @50
4 lb do	50 @52½
Machine Sewed	45 @—
Standard Gunnies	13½@14
Bean Bags	7 @ 7½

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits.

2½ lb cans	2 00 @ —
3 lb do	3 00 @ —
Jams and Jellies	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box	67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef,	
2 lb. doz	4 00 @ —
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton,	
2 lb. doz	4 00 @ —
Beef Tongue	5 50 @ —
Preserved Ham,	
2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½ lb. doz	3 00 @ —

COAL—Jobbing.

Australian, ton	8 00 @— —
Coos Bay	6 50 @ 7 00
Bellingham Bay	6 50 @— —
Seattle	6 00 @ 6 50
Cumberland	14 00 @— —
Mt. Diablo	4 75 @ 6 00
Lehigh	13 50 @— —
Liverpool	7 50 @ 8 00
West Hartley	10 50 @— —
Scotch	10 50 @— —
Scranton	11 50 @— —
Vancouver Id	7 00 @— —
Charcoal, sack	75 @— —
Coke, bbl	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manila	17 @— —
Greund, in cs	25 @— —

FISH.

Sac'to Dry Cod	4½@ 5½
do in cases	5 @ 6
Eastern Cod	—@— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb can	1 40 @ 1 45
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —

LIME, Etc.

Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @— —
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50

NAILS.

Ass'ted sizes, keg	2 90 @ 3 00

OILS.

Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @—
do, No. 2	1 05 @—
Baker's A A	1 25 @1 30
Olive, Flagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @—
Linseed, Raw, bbl	72 @—
Boiled	75 @—
Cocoanut	55 @—
China nut, cs	70 @ 72½
Sperm	1 40 @—
Coast Whales	40 @—
Polar	45 @—
Lard	90 @1 00
Oleophine	22 @ 22½
Devoe's Bril't	22 @ 23½
Photolitho	— @—
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @—
Downer Kor	37½@—
Elaine	37½@—

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@—
Putty	4 @ 5
Chalk	1½@—
Paris White	2½@—
Ochre	3½@—
Venetian Red	3½@—
Averill Mixed Paint, gal	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	5 @ 5½
Hawaiian	7 @ 7½

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	10 @ 10½
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal., ½ lb glass	1 50 @ —

SUGAR, ETC.

Cal. Cube, lb	11½@—
Powdered	11½@—
Fine crushed	11½@—
Granulated	11 @—
Golden C	9½@—
Cal. Syrup, kgs	70 @—
Hawaiian Mol'sses	26 @ 30

TEA.

Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., March 12, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3
Horse Shoes, keg	5 00 @— —½
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

WEDNESDAY M., March 12, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Sliding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Flooring	30 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	½

REDWOOD. RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Poluted	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	23 00
Half-Inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending March 11, 1879.

HIGHEST AND LOWEST BAROMETER.

Mar 5	Mar 6	Mar 7	Mar 8	Mar 9	Mar 10	Mar 11
29.975	30.135	30.043	30.081	30.185	30.306	30.367
29.897	29.967	29.982	30.030	30.024	30.205	30.308

MAXIMUM AND MINIMUM THERMOMETER.

58.5	58.7	55	50	60	59.7	06.3
55.5	49.3	47	48	51.2	50.7	52

MEAN DAILY HUMIDITY.

86	72.3	73.3	72.6	79	72	77.3

PREVAILING WIND.

S	SW	SW	SW	W	W	N

WIND—MILES TRAVELED.

402	360	230	257	301	134	123

STATE OF WEATHER.

Rainy	Fair.	Cloudy	Cloudy	Fair.	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

2.73	1.14	.95	.13	1.05		

Total rain during the season, from July 1, 1878, 19.10 in.

DEWEY & CO.

American & Foreign Patent Agents

OFFICE, 202 SANSOME ST., N.E.COR. PINE, S. F.

PATENTS obtained promptly; Caveats filed expeditiously; Patent Reissues taken out Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Agency Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our schedule price for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than any other agents.

The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of inventions discovered here than any other agents.

Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

Confidential.

We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars free

Home Counsel.

Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing to them the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

Engravings.

We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

DEWEY & CO.

United States and Foreign Patent Agents, publishers Mining and Scientific Press and the Pacific Rural Press, 202 Sansome St., N E. corner Pine, S. F.

REGISTER YOUR TRADE

MARKS.

The U. S Government now offers greater protection than formerly to manufacturers under the law of Trade Marks.

Those who manufacture a superior article, or put up improved packages of merchandise, should protect themselves from imitations by registering their Trade Marks.

We have special facilities for securing full rights by the registration of Trade Marks, and our terms are very reasonable.

Consultations free. Many dealers have missed fortunes from not being fully informed and protecting themselves in their rights.

DEWEY & CO., Patent Solicitors,
No. 202 Sansome Street, S. F.
A. T. DEWEY. W. B. EWER. GEO. H. STRONG

Patents for Mining and Farming Lands.

Having completo arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing au establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in ease of necessity secure the services of our home and Washington branch agency.

DEWEY & CO.,

Solicitors of Patents for Lands, Mines and Inventions, MINING AND SCIENTIFIC PRESS OFFICE, No 202 Sansome St., San Francisco.

SUMMER-FALLOWING LAND FOR SALE OR RENT upon the most reasonable terms—in subdivisions of from 50 to 1,000 acres. Climate healthy. Average rainfall over 20 inches annually. Crops sure. A diversity of semi-tropical and other fruits, corn, vegetables, etc., raised with ease. Address for particulars EDW. FRISBIE, proprietor of Reading Ranch, Anderson, Shasta Co., Cal.

The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana-British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

FOR SALE.—4-sided 0-inch Molding Machine. Jackson's Agricultural Machine Works, S. E. corner 6th and Bluxome Sts., San Francisco.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Griffith Consolidated Mill and Mining

Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California. NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 21st day of January, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
J H Brewer	30	50	$ 10 00
Warren Bryant	not issued	2100	420 00
Alexander Bryant	37	1125	225 00
Alexander Bryant	38	1125	225 00
L H Foote	30	100	20 00
L G Harvey, Trustee	35	4000	800 00
J H Roberts	19	500	100 00
J H Roberts	20	500	100 00
J H Roberts	21	500	100 00
J H Roberts	22	500	100 00
J H Roberts	26	500	100 00
J H Roberts	27	500	100 00
J H Roberts	28	500	100 00
J H Roberts	29	500	100 00
J H Roberts	30	500	100 00
J H Roberts	31	500	100 00
J H Roberts	32	500	100 00
J H Roberts	33	500	100 00
J H Roberts	34	500	100 00
J H Roberts	280	200	40 00
J H Roberts	281	200	40 00
J H Roberts	282	200	40 00
J H Roberts	283	200	40 00
J H Roberts	284	206	40 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, No. 330 Pine street, Room 48, San Francisco, California, on the 26th day of March, 1870, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. G. M. CONDEE, Secretary.

Office, Room 48, No. 330 Pine St., San Francisco, Cal.

Office Wide Awake Prospecting and Min-

ing Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Final County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

POSTPONEMENT.—The delinquent day of the above named assessment has been postponed until Tuesday, the First day of April, 1879, and the day of sale until Thursday, the First day of May, 1879, at the same hour and place. By order of the Board of Directors.

C. HILDEBRANDT, Secretary.

San Francisco, March 1st, 1879.

The California and Oregon Land Company.

—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the First day of March, A. D., 1879, an assessment (No. 2) of Forty Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of April, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Saturday, the Tenth day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco, California.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
F. LYSTER ..... Acting Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

ROSE EYTINGE.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE ..... Lessee and Manager

HYERS SISTERS.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR ..... Manager.
BARTON HILL ..... Acting Manager.

UNION SQUARE THEATER CO.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

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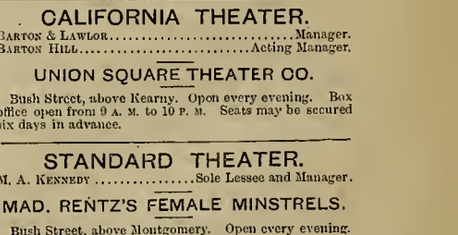
M. A. KENNEDY ..... Sole Lessee and Manager.

MAD. RENTZ'S FEMALE MINSTRELS.

Bush Street, above Montgomery. Open every evening. Seats may be secured six days in advance.



At the Old Stand, Market, head of Front Street, S. F.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

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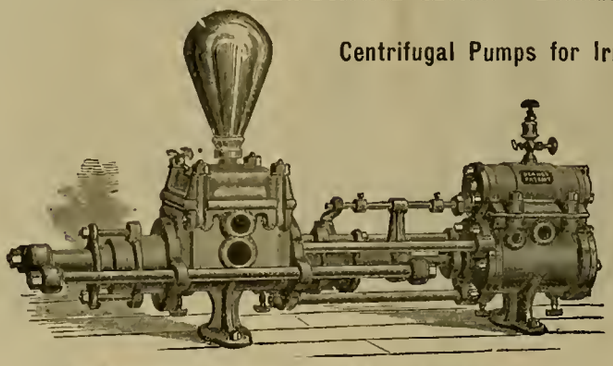

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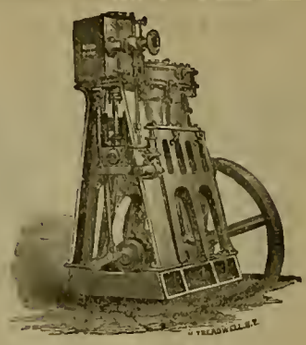

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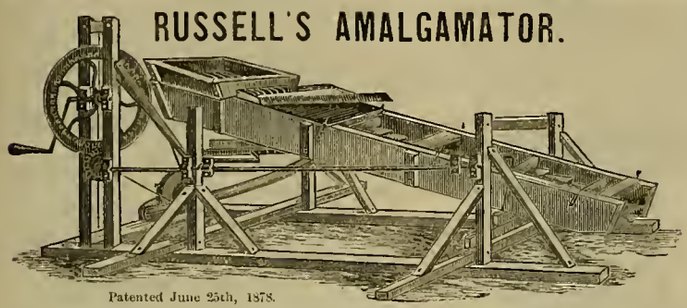

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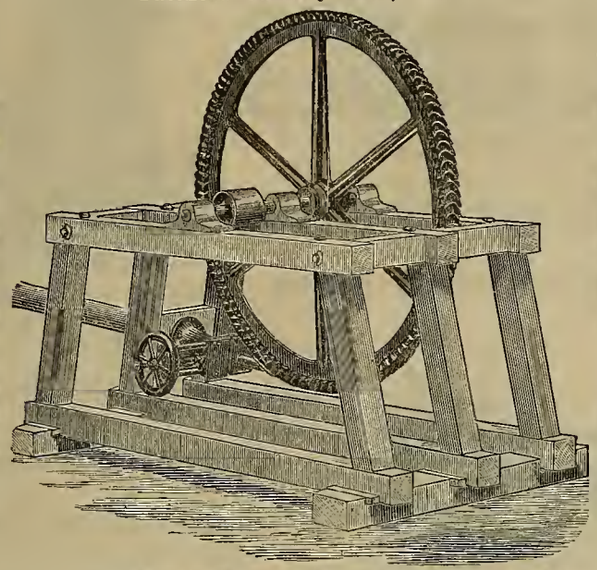

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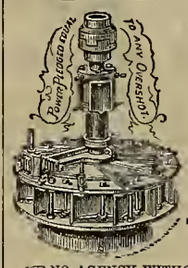

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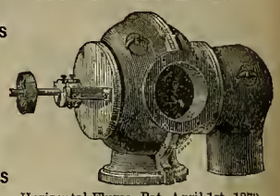

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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Quicksilver Combination.

The principal quicksilver producers in California havo about consummated an arrangement whereby the output of that metal will, for a period at least, suffer some restriction; an object that a portion of these companies havo been seeking to effect for several years past, that is to say ever since it became evident that an unlimited production, if allowed to go on, must preclude any of them from realizing a living profit.

But while the most of these companies were willing and even anxious to enter into a combination for this purpose, a few of them held aloof, not quite satisfied with the minor details, or hoping for such early improvement in prices as would obviate the necessity for such action. Disappointed in this, even these companies have at last, it seems, given their adherence to the plan proposed for guarding against the continuance of this ruinous overproduction. We are not advised as to the exact manner in which this is to be accomplished, further than that enough curtailment will be made to reduce production to the requirements of the market. Whether each of the companies now in the field will make a pro ratio abatement of their yield, or whether a few will retire altogether, sharing the profits to arise from an advancement of prices, while the remainder go on turning out their full complement of metal, as before, we are not informed.

It will be observed that this is not a combination entered into to force up prices directly, but to prevent, in the first place, their further decline, and ultimately bring about such advance as will make the business fairly remunerative. For the past two years the best conditioned of these companies have made but little money, the majority of them having been going behind at a rate that has compelled quite a number, after heavy expenditures for outfit, etc., to suspend operations, some of those that have kept on having done so merely in the hope that affairs would soon take a favorable turn. A monopoly of quicksilver or even extreme high prices, can, in no event, be brought about on this coast. We have a multitude of small mines that, while they cannot be worked with profit so long as prices remain greatly depressed, will be started up immediately should the latter undergo any marked advance, some of these mines being already opened and furnished with reduction works.

In adopting the policy proposed, these companies are not without precedents, the manufacturers and producers of certain articles elsewhere having in many instances found it expedient to pursue a similar line of action. Quite recently a course like this was forced upon the manufacturers of borax on this coast, the several companies engaged in the business having, through competition stripped it of all profits. Having, through a mutual arrangement, slightly lessened the production, the prices have so advanced as to leave a narrow margin for profits, where before there were none. Borax, however, is an article of large use and varied application in the useful arts, insuring for it under low prices an increased consumption, which is not the case with quicksilver. For this there may be said to be but a single use, wherefore about the same quantity will be consumed whether the price be high or low. With most commodities the maker or producer finds in the increased demand resulting from low prices some compensation for the latter; but not so the producer of quicksilver, wherefore, when prices drop below a remunerative figure he must devise some method for bringing about an improvement, give up the business or continue it at a loss. An advance in the price of this commodity of a few cents a pound, while it would not lead to any appreciable curtailment of gold and silver production, nor much oppress any class of consumers, would very often suffice to cover the narrow margin that with the producers of this metal divides living profits from dead loss.

Combination Lathes.

The lathe illustrated on this page has been made especially to meet a want felt by many for a really good and substantially made foot-lathe at a reasonable price. The bed, head and tail stocks are of iron, and the spindles of steel. A conical bearing is made for the head stock, so that the wear can easily be taken up. Material eighteen inches long and eight inches in diameter, can be turned in this lathe. The pieces that accompany it without extra charge are two T-rests, two plain centers, one open center for wood turning, and one face plate. The bench is made of iron, with a walnut top and drawer for holding tools. Like the lathe, it is well made in all its parts, and is strong, neat and solid.

Fig. 2 shows a circular sawing attachment, for this lathe is intended for those who desire a good, practical machine, and will be found very effective. The table is of iron, planed true, and can be adjusted as to hight. It has a guide running in a groove at right angles with the saw, and a slide operated in a similar groove parallel to the saw. The slide can also be adjusted to different angles. One each four-inch slitting and cutting-off saws accompany this attachment.

Fig. 3 is a scroll sawing attachment, which, like that for circular saws, is a good and thoroughly practical machine, sawing wood at least one and a half inches thick. It is moved by a pitman connecting it with the face-plate by means of a small stud. The bolt of the T-rest holder is used for fastening this attachment to the lathe, and when not in use it can be thrown back behind the shears without entirely removing from the lathe, unless so desired. The depth between the saw and back, or upright, is sixteen inches.

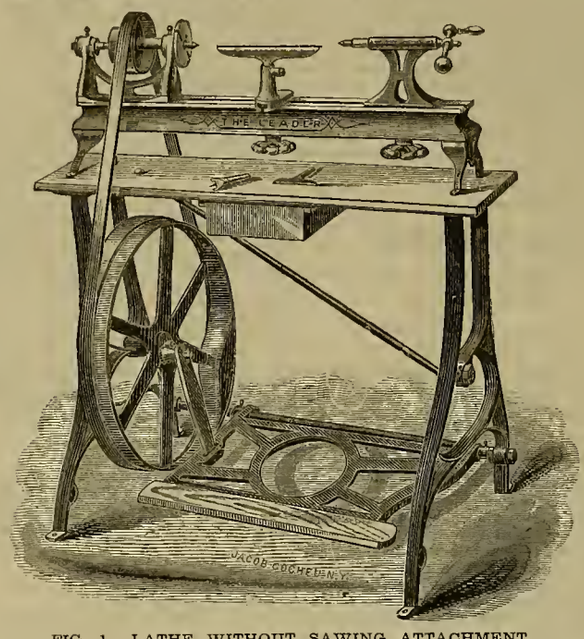

FIG. 1. LATHE WITHOUT SAWING ATTACHMENT.

These machines are sold by Dunham, Carrigan & Co., of this city. The price of the lathe without saw attachments is $45; lathe with scroll saw attachment is $55; and with both scroll and circular saws is $70.

CRYOLITE.—A peculiar specimen of quartz recently sent up from San Diego, and having the appearance of cryolite, was presented to the Academy of Science at the last meeting, under the supposition that it was cryolite. A more careful examination, however, by Mr. Gibbes, the curator of mineralogy, showed that the specimen was only quartz. Cryolite has only, so far, been found in Greenland, and its discovery elsewhere was looked upon as a matter of great interest, as the article is valuable in a commercial point of view. It was a mistake, however, to call the substance referred to, cryolite.

THE Moffett register has proved a failure.

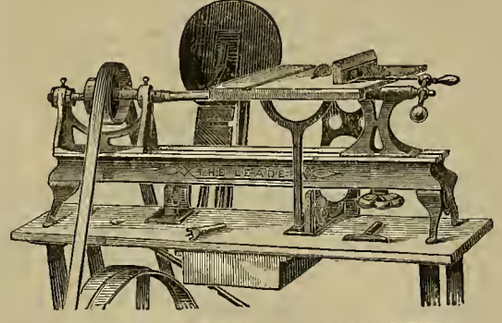

FIG. 2. CIRCULAR SAWING ATTACHMENT.

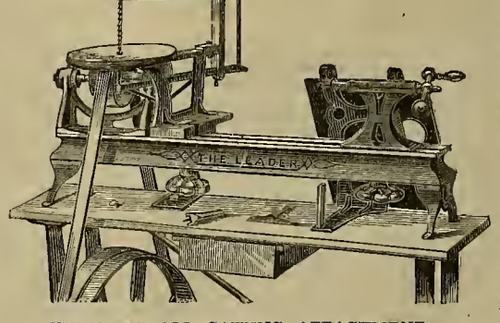

FIG. 3. SCROLL SAWING ATTACHMENT.

The Proposed Free Library.

One year ago the Legislature of California passed a bill establishing a public library in the city of San Francisco, and named the following citizens who were to be charged with the duty of carrying out its provisions: Geo. H. Rodgers, President; A. S. Hallidie, J. S. Hager, Andrew J. Moulder, Richard Tobin, John H. Wise, Henry George, Chas. Terrill, Irving M. Scott, Louis Sloss and E. D. Sawyer. The gentlemen thus commissioned have been actually at work, and during the past six months have made energetic efforts towards its immediate and practical inauguration. Four committees—on finance, books and donations, rules and government, and buildings and rooms,—were then chosen among themselves by the trustees to co-operate in the work of organization. A conference committee, consisting of Mr. George H. Rodgers, the President of Board as chairman, and the various chairmen of the above-mentioned committees, was also appointed to confer with public parties generally, and a corresponding committee from the Board of Supervisors in particular, and to settle and define the details of the work coming under their jurisdiction. The result is that it is expected to open the library to the public on the 15th of May, or the 1st of June at the latest. The committee have all along been hampered by a lack of funds. Eight months ago the Board of Supervisors, in compliance with the law, set aside $2,000 a month as a sufficient fund for the purpose. The comparative smallness of this sum has caused the delay in carrying out the plans, for the Trustees judiciously thought it best to postpone the inauguration until sufficient funds had been accumulated to enable them to make a real start and to purchase a sufficient number of books to form the nucleus of a creditable public library. No money has as yet been spent, but the immediate purchase of from 12,000 to 15,000 volumes has been decided on, most of which have been already selected. This will cover an assortment of all classes of standard works, none of which for the present will be duplicates. This fact, together with the limited number of books necessitated by the scarcity of funds, compels the opening of the library simply as a reading room and place of reference. No circulation can be thought of with but 15,000 volumes on the shelves, but as soon as enough books can be purchased the public will be allowed the priviliges of drawing them out. The whole aim of the Trustees so far, has been economy, and as few expenditures have been indulged in as possible. The working officers will consist of a librarian, assistant librarian, janitor and boy. These positions have been filled or will be soon. The Trustees have secured as librarian, Mr. Albert Hart, ex-State Librarian and ex-Secretary to Gov. Booth, a gentleman whose experience and cultivation in every way fit him for the position.

The choice of a room now rests solely with the Supervisors. Pacific Hall will probably be taken, as it is almost the only place at present available. This is 50x135 and is thought large enough to answer both as library and reading room, similar to the plan adopted by the Cooper Institute. The check system of that association will also probably be adopted, by which a person on entering the library, will receive a check, which he will be obliged to present to the librarian in order to obtain a book from the the shelves. When the borrower of the book returns it to the librarian he receives his check, which he is obliged to show at the door upon leaving the library.

A SLIGHT shock of earthquake was felt in Carson City, Nev., a little after 11 o'clock Tuesday night. The vibration seemed to be east and west.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Nevada's Wealth.

New Boston District, Esmeralda County.

EDITORS PRESS:—It may not fail to interest some of your many readers to learn through the columns of your valuahls paper, of some of the interestiug and important sources of wealth that are scattered among the mountaius of the State of Nevada.

As the State is so closely allied to us in her commercial relations, every interest that increases her wealth hut adds to our coffers, through the merchants aud miners who find their way to San Francisco to replenish their stocks, many of the large mining properties that have been opened up in the last few years, bids fair to rival some of ths most productive of the Stats. I allude to the mine and mill at New Boston, Esmeralda couuty. There are connected with this minc no less than 14 ledges, many of which are very extensive and very rich. Some of the veins ars 16 to 18 feet wide, and are pay ore the width of ledge—making an average of $100 per ton; while ths amount of ore exposed to sight by the prospect work done, is simply fabulous, and will keep a mill running for years. No where in the State did I see such a rich and extensive body of ore.

They havs 13 stamps, a large sized Davis pulverizer and a White & Howell furnace of 50 tons capacity. The ore is rebellious, containing about 25% of copper, but yielded above $50 per ton without roasting. It was expected the furnace would he running in a short time after I was there, and ere this, I presume they are taking out from $2,000 to $3,000 per day, as it was expected the ore, when roasted, would pan out $100 per ton and over of gold and silver, the silver predominating in value.

If this mine was situated a little nearer civilization, it would soon become one of the most promiuent in the State.

The location of the ledges are so highly elevated above the mill that hoisting works are not needed, nor are they troubled with water in the mines, for at the lowest depths of the shafts I found them as dry as a toper at half past 5 A. M. The ledges are true fissure veins with perfect walls, the direction nearly north and south with a dip to the west of about 85 degrees. The work on these ledges was commenced several years ago by the present owner, Mr. A. J. Rhodes, who continued to prospect each one of the ledges, until he became satisfied that they were permanent, he then proceeded to erect his present mill and bring the water from an adjoining mountain some five miles away.

The long distance to transport freight by wagons and the scarcity of lumber, makes mining in Nevada more expensive than in our State, bnt the quantity of ore and its high grade with a careful selection of a ledge, thoroughly prospected, warrants the outlay, and will amply repay the investment.

If the capital invested in fancy stocks, where there is not even a prospect for a ledge, could be diverted into some of these legitimate mining camps, that are sure to pay the investment a hundred fold, what a change would be brought about in our commercial circles, and the disappointments of broken fortunes changed to happy smiles, and the enchanting scenes that follow in the bright pathway of domestic happiness—for prosperity always brings happiness; first to the individuals, then to the community in which the individual resides.

But—excuse my moralizing—I intended to give you facts pertaining to the wealth of Nevada.

The Great Salt Marsh.

After leaving the New Boston camp, I was invited to inspect the great salt marsh, as it is known in that country, and here I met with an anomaly in nature—the extent and numher of the salt springs covering as they do the enormous area of 4,160 acres—the springs, each one of which is separate from the other, numhers over 2,000, and each spring is capahle of yielding one ton of salt per day, the crystallization occurring without any artificial aid whatever. The salt water rises through a perpendicular column of crystallized salt, which neither increases nor diminishes appareutly from the friction of the water, hut as soon as the water reaches the surface, the crystals begin to form, and the salt is gathered hy the attendant with a long handled shovel, who makes his rounds, in piling up the white pearly crystals, in little heaps on the edge of the surrouuding elevatiou.

Not many of the springs are utilizcd, as the owuers cannot fiod sale for so large a product, and it heing 120 miles to railroad, the sale is confined to the local demands.

The salt is the purest in the country, an analysis by a friend of mine, gave the following results:

Chloride of sodium....Na Cl	.95
Free soda.....Na	.03
Biborate soda.....Na Bo 2	.02
Total	1.00

With railroad facilities to hring this salt into market, we could be supplied with the purest articlc over produced at a comparative low price, as I was told it could be gathered and dried and sacked for $4 per ton, including the cost of hags. A railroad is projected, with every probability of its being built, that will leave the Central Pacific at Wadsworth and pass within a few miles of this famous group of salt springs, which alone would furnish sufficient freight to pay a handsome dividcnd on the cost of construction.

Borax.

In addition to the salt springs in this wonderful basin, there are several large hihorate of soda springs that are constantly producing borax. The owner, who accompanied me, took a shovel and excavated a hole in the vicinity of one of these springs, and for two feet down was a solid mass of horax crystals, which had only to be gathered and washed to remove the adhering dirt and it was ready for market. Here were thousands of tons of this valuable product which could be laid down in your city at a few cents per pound if railroad communication was established at or uear this locality; and certainly the supply seems to be inexhanstible, as it is constantly forming. Some two miles away from these horax springs, aud on the opposits side of the salt springs, we were shown an immense deposit of bihorats of lime; the purest I ever saw, samples of which I brought with me, and also send them to you. This deposit is most remarkable, from the fact that its formation is continuous. It would seem that the vapors of boron find their way up through the earth, and, coming in contact with water containing lime, abstract the lime and thus form this wonderful dsposit. The formation is found in small balls resembling cotton in appearance, and upon examination are found to contain beautiful white, pearly crystals of a lamiuar structure, with a soft, silky feeling; insoluble in water.

The sources from whence coms this factor of wealth to the State is hidden within the deep arcana of nature, and is without question one of ths great curiosities of nature's lahoratory. The elevation is over 3,000 feet above the sea, yet it is surrounded by mountain ranges, from whose lofty hights millions of bullion can be taken with proper machinery and a judicious expenditure of money. But no where in the State is there such a concentration of natural wealth as comes rising up in a perpetual stream in this famous salt mash of Esmeralda county; owned by A. J. Rhodes, of Bellville. JNO.

THE ENGINEER.

Cheap Railways.

[Written for ths PRESS by R. GRIMSHAW.]

There is now being agitated in France, the question of cheap public railways; and it is probable that the new law will authorize the establishment of railways on the public roads and streets, subject to the authority of the General Councils as regards construction and maintenance, grades, curves, gauge, etc., the concessions revocable by the "Conseil d'Etat;" speed limited to 20 kilometers per hour, and the whistle replaced by bell or trumpet; no night service; as few trains as possible, say three per day; mixed freight and passenger traffic. As the lines will not be more than 30 kilometers each in length, hut one man will be needed for both "engineer" and "conductor." The speed of 30 kilometers can he reduced near to towns and crossings, etc.,—being averaged by a maximum of 25 kilometers. The charge proposed per traveler is seven centimes per kilometer; and for merchandise, 13 centimes per ton per kilometer. Supposing that the freight and passenger receipts are equal, we will have, say—

Kilometer receipts per year	2,000 francs.
" " " day	5.48 "
" " " train, counting six trains per day	0.90 "

Kilometer units per train:

Passengers $\frac{0.45}{0.07}$ = 6.420 travelers

Freight $\frac{0.45}{0.13}$ = 3.461 tons

This is reckoning, then, on an average of 6.42 travelers and 3.471 tons of freight per train to produce 2,000 francs per kilometer per year.

	Tons.
The proposed train is to have a mixed car (containing two tons of baggage or freight, and six passengers) weighing empty	1.200
Passenger car, 14 places, weighing empty	1.200
Freight car holding 3.6 tons " "	1.200
Weight of 6.42 passenger @ 70 kilos each	.449
Freight	3.461
One empty car weighing	1.000
Total	8.510

The maximum regnlar grade of roads and streets is 5 iu 100, although 6 and 7 are sometimes found. Counting a meau train load of 8½ tons, we shall see that a tank locomotive with three pairs coupled, and weighing nine tons—that is, three tons per axle, can easily draw such a load up a grade of 7 in 100. So the grade will be no trouble. Now about thc curves. We do not wish to go too far iuto the battle of the gauges. There is no question now but that narrow gauges are the cheapest and best paying; the only trouble is about the changing freight from one gauge to another. Still where we are only allowing for a freightage of 2,000 to 2,500 francs per kilometer a year, a wide or "standard" gauge is out of the question; and it becomes necessary to choose the narrow with a rolling stock of 30,000 francs per kilometer—a reasonahle figure.

One of the chief advantages of the narrow gauge is the permissibility of short curves. Of course, with rigid wheels the nearer the wheels the shorter the curve they will turn on and the less resistancs from curves.

Just what proportion to lay down hetween the gauge-width and the minimum curve-radius depends upon many things—such as conicity of the tires, end-play of axles, "play" of ths rails themselves, etc. But the many narrow-gauge railways made and run up to to-day prove:

1. That curves of 80 or 90 meters radius for the meter gauge, and of 40 to 50 meters radius for the three-quarter meter gauge, are as practicable for running as those of 250 to 300 meters for the "standard" gauge.

2. That hy slowing up it is possible to round curves of only 15 to 20 meters radius.

There being light traffic there can he heavy grades. We shall now look at the question of not only whether the rails can follow the grades and curves of ordinary roads, but whether they can be laid thereon *without necessitating widening*. This is a very important question. The three-quarter meter gauge might be laid on one side of most roads, on a raised embankment, leaving sufficient space at the side and yet prevsnting ordinary vehicles from getting into danger. On roads of six meters width the three-quarter metsr gange is the widest that can be thus laid. On very narrow roads it would be necessary to have ths rails at the road level and the track stone ballastcd—and if necessary counter rails could he used so as to permit the track being used by ordinary vehicles.

Iu towns, the track should be in the middle of the road whenever this would leave enough room at each side for a wagon track. If at the side, on account of narrow width it might hinder cars or wagons from standing iu front of stores, etc., especially along a river bank—a very serious iuconvenience. But for rural roads this makes but little difference, as the road need be free but six times a day for a few minutes at a time.

The three-quarter meter gauge permits the use of cars only 1½ to 1¾ meters wide from out to out—far within the maximum permissible carriage width on ordinary roads; the train having the advantage over the wagons, of less width, more docile motors and invariahle track or course. The locomotive does not balk, and can be more quickly stopped than a horse.

There is in Wales a railway of 60 centimeters gauge—that of Festiuiog; in Germany tbere are two of three-quarter meters: that of Broelthal near Cologne, and that from Ocholt to Westersted, near Oldenburg*—both carrying passengers and freight.

The economy in rails is considerable over the standard gauge, a rail weighing 12 kilos per meter sufficing instead of one of 35 to 37 kilos, on account of the maximum weight per axle being but 3¾ tous instead of 12 to 13 tons.

If we suppose the rail supported on two ties, we get its resistance from the formula:

$$R = 0.148 \frac{VPa}{I}$$

In which P is the rolling load on one whcel; a, the distance between the ties; V, the distance from the neutral axis of the most distant fiber, and I, the moment of inertia of the rail section referred to its neutral axis. For the type adopted—

$V = 0.03536.$
$I = 0\,000{,}000{,}887$
$a = 0.68$

The maximum weight of locomotivcs being, say, three tons per axle, we have P = 1,500 kilog. These elements give us R = 6.01 kilog. per square millimeter, quite a safe figure, as the 35 kilog. iron rail of the Vignole de l'Est road carries 8.16 kilog. per square mm., and the 36 kilog. iron rail of the Orleans line bears 8.50 kilog. per square mm.

As regards the power of the locomotive, in the ordinary system the motive force is brought to bear on the resistance of the train by means of adhesion. The resistance increases rapidly with the grade, and, while we can increase the motive force by diminishing the speed, we cannot so increase the adhesion. Hence the systems of artificial adhesion, such as the central rail gripped by horizontal wheels, used on the Mt. Cenis road, and the rack and pinion employed at the Rigi. These are, however, too expensive and otherwise unsuitable for our proposed roads.

We have then to haul a train of 8½ tons on grades of 7 in 100 and short curves. The tank locomotive will do this best as economizing dead weight and increasing adhesion. The engine should have all wheels coupled. The number of axles should be large enough to case the rails, and they should yet he close enough together to give curving capacity. The heating surface should be qnite large, the wheels of small diameter, to lower the center of gravity, round curves easily, augmcnt the piston speed, and the numher of "exhausts" which quicken combustion.

Such dimensions as these would answer:

Weight of tank locomotive, 3 pairs coupled	9 tons
Wheel base	1.50 m.
Boiler pressure	10 atm.
Heating surface, fire-box	2.30 sq. m.
" " tubes	18.9 sq. m.
Diameter of coupled wheels	0.60 m.
" cylinders	0.22 m.
Piston stroke	0.30 m.

This locomotive, hauling three tons on each axle, and wheel base of 1½ meters, conld run on 12 kilog. rails and rouud 15 meter curves. We shall see if it could mount grades of 7 in 100:

Supposing Q thc weight of the train and P the weight of the engine (in tons), the resistance would be—

$$(Q + P)(r + i);$$

r being the resistance to traction per ton on a level, and i the resistance due to gravity, in grades.†

Theory and experience show that i = as many kilograms per ton as there are thousandths of inclination.

The horizontal resistance r increases with the speed, the sharpness of the curves and ths length of ths trains. On steep grades, ths speed would be reduced and in our case ths train length short. We may consider $r = 6$ k. If then Q = 8½ tons, P = 9 tons, $r = 6$ kilog., $i = 70$ k., the resistance in the maximum grade will be—

$$(8\tfrac{1}{2}\text{ t} + 9\text{t}\,(6\text{ k} + 70\text{ k}) = 1{,}330\text{ k}.$$

The adhesion is expressed by

$$\text{f } 1{,}000\text{ P};$$

P being the weight of locomotive iu tons on ths driving wheels; f a co-efficient depeuding on the contacting surfaces, and varying from one-quarter to one-tenth, according to the weather. It is greatest for rails that are very dry or very wet, and weakest for greasy or damp rails. Ws may say one-sixth to one-seventh, and calculate with one-sixth on the maximum grade.

It will run easier on the level and always bs kept up to this on the grades by the use of sand or water. Supposing the water and coal to bs partly used, so that the adhesion is dependent on only 8½ tons weight, we shall have f 1,000 P = 1,416 kilog., while we have a resistance of only 1,330 kilog.

As regards the hauling force, this depends on the heating surface. For slow speed locomotives, each square meter of actual heating surfacs should produce 7 horse-power; the actual heating surface being say ⅓ the tubs surface. Our locomotive should theu have a hauling powcr of—

$$7\left\{2.3 + \frac{18.9}{3}\right\} = 60\text{ H. P., or } 4{,}515$$

kilogrammeters, which may be devided into a work of traction F, at a speed V; that is FV = 4,515 kilogrammeters.

The work of traction at the circumference of the drivers, is—

$$F = \frac{m\,p\,d^2 l}{D} \quad \text{in which}$$

P = pressure per square meter on the boiler; m, a coefficient varying with the cut-off; wire-drawiug, ——; d, the diametcr of cylinder; l, the stroke of piston; D, the diameter of drivers (all in meters). F is at a maximum when m is greatest; that is, using full steam without cut-off; in this case m is taken as 0.65.

If we substitute

$d = 0.22$
$l = 0.30$
$D = 0.60$
$P = (10 - 1)\ 10.333\text{ k} = 92\,997\text{ k},$

we shall have for maximum of F,

F = 1,463 kilog.,

which is all right when the adherence is 1,416 and tbe resistance 1,330 kilos.

When the work of traction is greatcst, the speed is least, and has for value

$$V = \frac{4{,}515\text{ kgm}}{1{,}463\text{ k}} = 3.08\text{ m}$$

or 11 kilometers per hour.

Thus our locomotive on grades of 7 in 100, will not develop its maximum traction effect beyond 11 kilos per hour.

It is interesting to note the effect of steep grades on the useful effect of locomotives. We have—

$$(Q + P)(r + i) = \text{f } 1{,}000\text{ P; whence}$$

$$Q = \left\{\frac{\text{f } 1{,}000}{r + i} - 1\right\} P$$

Making f = ⅛, then

r = 6 K

Giving successive values to i, we have the following table:

Grade per 1,000 (i)	Resistance per ton in Kilogrammes. ($r+i$)	Number of times its own weight a locomotive can haul. $\left\{\frac{f1{,}000}{(r+i)} - 1\right\}$	REMARKS.
30	36	3.611	
35	41	3.049	Appenzel R. R.—St. Germain R. R.
40	46	2.609	Lausaune to Echullens.
45	51	2.255	Enghien to Montmorency.
50	56	1.964	Waedenswell to Einsilden.
55	61	1.721	
60	66	1.515	
65	71	1.366	
70	76	1.184	Utliberg R. R.
75	81	1.05	Tavaux-Ponsericourt

The ahove tahle shows very clearly the economy in easy grades, and we believe that the foregoing figures will he found valuahle not only for demonstrating the advantage of the narrow-gauge, hut for calculating the elements of any desired gauge, grade or curve.

† The friction of the working parts is not counted.

* The rails weigh 12 kilog. per meter.

WIRE BELTS.—A German firm is manufacturing, woveu steel wire belting, of a peculiar make, as described below, which they claim to transmit power well, to operate without lengthening, and to run smoothly because there is no overlapping at any place. The spirals of wire are woven across the helting, so that three, four or more spirals form one link. The space betwcen two links is besides, filled up with a cross-piece, so that the closely woven netting of spiral wire forms a baud of great strength and flexihility. It is faced and lined with rubber or leather.

MECHANICAL PROGRESS.

Welding of Metals at Low Temperatures.

Some tims ago, iu order to estimato ths amount of hydrocyanic scid in a solution, Mr. Charles A. Fawcett, of Glasgow, Scotland, procipitated it with silver nitrate. After having filtered aud washed tho precipitate, he reduced it to tho metallic state by heating to the required temperature. Just as ho was about to allow it to cool ho noticed a small piece of dirt among tho reduced silver. Iu order to separate thsm he took a thin platinum wire and pushed the silver to one side, but on attempting to take the wire away the silver remained in contact with it. As he thought this curious, he tried the following experiment: Ils took a piecs of silver foil, about one centimeter square, placed it in an inverted porcelain crucible lid, and heated it to about 500° C.; then he brought into contact with it the extremity of a thin platinum wire, and to Iris astouishment tho wire raised the silver from tho lid, and it remained in contact when cold.

Tho silver being so much below its melting point, its behavior puzzled him, so he wrote to Sir W. Thomson for an explanation. On witnessing the experiment, Sir William prouounced it a remarkablo case of "cohesion," the two metals, in fact, "welding," although the temperature was far below the melting point of silver. Mr. Fawcett says that tho experiment can be performed successfully at lower temperatures than 500° C., if smaller piecos of foil are taken; and that other metals, for instance, copper and aluminum, cohere to silver in the same manner as platinum, but less strikingly.—*Scientific American.*

Motive Power from the Condensation of Steam.—The water from a lodge is, accordiug to the invention of Mr. Robert Wortley, of Oldham, England, conveyed by pipes into a well ahout 20 feet below the level of the lodge, into which is inserted the lower end of a pipe 32 feet high, equal to the pressure of one atmosphere, the upper end of which pipe is placed in a cistern; this cistern is in communication ahove and below by pipes and valves with a second cistern, in which is a float. The lid of the second cistern is iu communication with the cylinder of a steam engiue. Tbe lower end of tho second cistern is in communication through a valve with the hot well aud with the lodge. When the water from the first cistern enters the second cistern the float rises, and the water from the lodge keeps the well at the same level. When the steam from the cylinder of the steam engine enters tho second cistern it lowers the float and drives the water into the hot well and back into the lodge; the steam from the second cistern then passes through the top valve into the first cistern and is there eondensed; the partial vacuum thus formed then raises more water from the well, and the operations are repeated as before. In the lid of the first cistern is a pump to draw off the air, and this pump is used to fill both the cisterns with water on commencing work. Between the lodge and the well is a turbin, or a water wheel, or other hydraulic engine, to make use of the fall of water between the two levels.

Old and New Objects of Invention.—The inventions of the last hundred years sometimes appear more grand and far reaching than any now being developed or demanded. But it must he remembered that the old inventors had a clear field. Everything was demanded and nothing was done. The steam engine, the cotton gin, the telegraph, smelting with pit coal, the hot blast, the rifled cannon, aud all the other great inventions which have ehanged the whole aspect of life, were then unknown, and even the most imperfect development of them was more striking and revolutionary than the later and really more valuable refiuements of the same inventions. And it does not follow that less useful work is wanted or likely to he done now. On the contrary, the improvements in steam power, for instance, likely to be developed during the next hundred years, will have a greater money value than all tbat has preceded—perfect as the steam engine is to-day. The old inventors were called upon to discover and open the doors of Nature's storehouse; the later inventors are called upon to hring out and set in order her wonderful secrets.

Shipbuilding in the United States.—The following statistics show that the shiphuilding industry is not quite extinct in this country: During the fiscal year ending June 30th, 1878, 32 iron vessels were built, with a tonnage of 25,960.29 tons. This record is second to the hest record the country has yet made, which was in 1874, when the tonnage aggregated 33,097 tons. The next best record in tonnage was in 1873, when it amounted to 26,548 tons. The number of iron vessels built during the past year was greater than in any other year, the year which most favorably compares with it being 1873, when 26 were built. Of the vessels built during the past year, 9 were ocean propellers, varying in tonnage from 1,156 tons to 3,548 tons; 1 was a lake propeller of 306 tons; 1 was a stern-wheel river steamer of 1,028 tons; 7 were side-wheel river steamers, ranging from 128 to 1,285 tons; 13 were steam tugs, the largest of which measured 180 tons; and the remaining vessel was a yatch. The current year promises to surpass the last cousiderbaly in its additions to our iron shipping.

Working up Iron and Steel Shearings.

Thin shesrings or pieces of iron or steel—such, for examplo, as tho scrap from cutting iron sheets for tin-plate making, and from other operations in which thin sheet iron or steel is employed—are frequently reworked with other metal either in the puddling furnace or in the retining furuace. In some cases the scrap has been placed loose in the puddling or refiuery furnace, but more commonly it is made into bundles. In any ease the binding only serves to keep the material together whilst heating up, for the bundle then falls apart, allowing the metal to mix with the remaiuder of the chargo upon the bed or hearth of the furnace. There is much loss in this process of reworking, 30 cwt. of this scrap not producing more than a ton of manufactured metal. Accordiug to tho invention of Mr. J. H. Rogers, of Llanelly, the shearings or waste pieces of thin iron or steel are compacted together into masses or blocks, and these, either alone or together with other pieces of iron or steel, are placed in a rehcating furnace, and, when heated to a proper temperature, are cousolidated under a steam hammer or in other conveuient wsy. In this manner he can obtain a ton of manufsctured metal from 23 cwt. of shearings. In order to form the shearings or pieces of iron or stesl into masses or blocks ready for heating, he places them in a box or mold, and by a steam press or other suitable machine he presses the contents of the box or mold until a compact block is obtained. The mass thus compacted is withdrawn from the box or mold hy an opening provided for the purpose, and which is closed by a door whilst the material is being molded. The compacting of the scraps is performed in a cylinder or mold, wherein they can be compressed by a kind of steam hammer. To discharge the molded mass or block, the box or mold is opened, and by means of a bar inserted at a suitable hole it is forced out in a condition to go into the reheating furnace. In the furnace, and in the subsequent hammeriug, the blocks or masses are treated in the same way as piles or blooms.

Paper vs. Iron Car Wheels.—According to the Cbicago *Railway Review*, the average running capacity of an ordinary iron car wheel is about 75,000 miles; while that of a paper wheel, with a stcel tire, is from 450,000 to 550,000 miles. Iu order to get this wear, it is necessary to give the tire from three to four turnings. The first cost of the paner wheel is $65, and of the best quality of cast iron wheel $14. The mileage of tbe latter is usually guaranteed at 50,000 miles. The cost of turning the steel tire is $35, which may safely be estimated as equal to the cost of the more frequent renewals of cast iron wheels with the attendant expenses of transportation in each case. The paper wheel costs $65, and runs 450,000 miles in 2.8 years. For convenience in reckoniug, and at a disadvantage to the paper wheel, on account of the interest money, call this period three years. At the end of this time the original cost, with 7% compound interest, amouuts to not quite $80. But during this period niue cast iron wheels have been used, costing $14 each. Allowing a rebate of $5 each for the worn out wheels, and calculating on simple interest at 7%, the cost of the wheels for this service amounts to $91.50, showing a saving in the case of paper wheels of $11.50, and were compound interest computed, as in the case of the paper wheels, the saving indicated would be a much larger amount. In computing the cost for the second period of three years a much greater saving would he shown, since a renewal of the tire only, at a cost of $35 is necessary, instead of a first cost of $65 for a new paper wheel. The data from which this conclusion is reached are vouched for by the Pullman Company. Tbe *Review* adds that the experience of the railway companies which have used the paper steel tired wheels bears out the records of the Pullman Company. As engine truck wheels the paper wheels seem to he especially successful, the experience on some roads warranting the couclusion that they will make 800,000 miles before the tire requires renewal.

Artificial Marble Producen by Steam Heat and Pressure.—A process has been invented hy Miss Hosmer, the sculptress, for making artificial marble which differs from previous processes in the fact that limestone in the solid state is employed as the base instead of a mixture of plaster and cement. The limestone is worked by any suitahle means to the desired form, and is then placed in a boiler furnished with a safety-valve aud manometer, so that the pressure therein may be noted and controlled as may be required. The boiler is filled with pure water at the ordinary temperature, care being taken that there is no mineral deposit introduced with the water, and that the water completely covers the objects placed within the boiler. The boiler is then hermetically sealed, and fire applied, and the water allowed to boil until the manometer indicates 75 pounds of atmospheric pressure if the objects are small, and 90 or 100 pounds of pressure if the objects are large. When the heat reaches the above-mentioned point the water is allowed to cool until the pressure indicated by the manometer returns to zero. The water is then taken out of the boiler either by means of a pump or a syphon, and the objects are removed from the boiler preparatory to heing placed in the alum or colored bath, various recipes heing given for different colors.

SCIENTIFIC PROGRESS.

The Telectroscope.

M. Senlecq, of Ardres, bas recently submitted to the examination of M. Du Moncel and Hallez d'Arros a plan of su apparatus intended to reproduce telegraphically at a distance the images obtained in the camsra obscura. This apparatus will be based on the property possessed by selenium of offering a variable and very sensitivo electrical resistsuco according to ths different gradations of light. The apparatus will consist of an ordinary camera obscura, coutaining at the focus an unpolished glass, and any system oi autographic telegraphic transmission; ths tracing point of the transmitter intended to traverse tho surface of the unpolished glass will be formed of a small piece of selenium held by two springs acting as pincers, insulated and connected, one with a pilo, the other with the line. The point of sslenium will form the circuit. In gliding over the eircuit, more or less lightened up, of the unpolished glass, this point will communicate, in different degrees and with great sensitiveness, the vibrations of the light. The receiver will also be a trscing point of black lead or pencil for drawing very finely, connected with a very thin plate of soft iron, held almost as in the Bell telephoue, aud vibrating before an electro-magnet, governed by the irregular current emitted in the line. This pencil, supporting a sheet of paper so as to receive the impression of the image produced in the camera obscura, will translate the vibrations of the matallic plate by a more or less pronounced pressure on that sheet of paper. Should the selenium tracing point run over a light surface, the current will increase in intensity, the electromagnet of the receiver will attract to it with greater force the vibrating plate, and the pencil will exert less pressure on the paper. The line thus formed will be scarcely, if at all visible; the contrary will be the case if the surface he obscure, for the resistance of the current increasing, the attraction of the magnet will diminish, and the pencil, pressing more on the paper, will leave upon it a darker line. M. Senlecq thinks he will succeed in simplifying this apparatus hy suppressing the electro-magnet, and collecting directly on the paper by means of a particular composition the different gradations of tints proportional to the intensity of the electric current.—*London Times.*

Something Curious about Explosives.—A remarkahle accident happened not long ago to M. Zede at the Normal school in Paris. He was studying the properties of a composition formed of equal parts of gun-cotton and nitrate of ammonia. This was inflamed in a bronze tube of six millimeters internal diameter, and expanded without detonation. Thirty experiments had been made, and M. Zede then reduced the size of the tube to five millimeters. When he tried the experiment anew under these conditions a frightful explosion occurred. The tuhe was shattered into 60 pieces, some of which passed through the roof of the laboratory and penetrated about four centimeters into a brick wall. The operator had one of his legs broken. This accident is engaging the attention of the French Commission des Poudres et Salpetres. M. Sainte-Claire Deville, in the Academy, pointed out that the fact belonged to a category including already several others, and he recalled an observation by Prof. Abel. Ahout 0.2 grains of chloride of nitrogen is placed in a watch-glass, and exploded with a piece of phosphorus; the noise is tremendous, but the explosion has little or no shattering effect. Now repeat the same experiment, after having breathed on the chloride so as to deposit a thin envelope of moisture, which cannot he more than a thousandth of a millimeter thick. In this case the explosion is less noisy, hut the effects are quite different. Not only is the glass pulverized, hut the tahle supporting it is perforated.—*Boston Journal of Chemistry.*

Powders Solidified by Pressure.—A Belgian scientific journal describss some interesting experiments lately made hy M. Spring, who bas subjected a number of finely-divided substances to a pressure calculated to be eqnivalent to 20,000 atmospheres. Potassium nitrate and sodium nitrate were generally converted into a perfectly homogeneous mass, which was harder and denser than the fused salt, and was translucent like porcelain. Sawdust exhibited a "slatey" cleavage and had a density more than three times that of the wood from which it was made. The author points to these experiments as having estahlished the possibility of causing cohesion of solid bodies by the application of great pressure, unmindful of the fact that what are called dusttiles are largely manufactured by this very method. How far the effects of simple pressure are taken into consideration hy geologists in their study of the solid layers of the earth's crust is open to question.

Potassium.—As a lecture experiment Dr. Erckmann, introduces a pieee of potassium, of the size of a pea, into a small test tuhe, heats to fusion, turns the glass round and round till the metal congeals, and then seals up the tube. The greater part of the potassium is deposited on the sides of the tuhe as a specular metallic coating, resembling silver, and can be exhibited during lectures, etc. The other alkaline metals may he similarly treated.

Geological Changes in Progress.

In the *Popular Science Monthly* Prof. J. S. Newberry told us lately thst various facts indicate that the coast of New Jersey and Long Island is gradually sinking. From the marshes of New Jersey are taken the trunks of trees which could not have grown there except when it was drier grouud, and on the shore stumps are seen now under waters of trees which must have grown on land. So, too, the sea throws up in storms portions of turfy soil, once covered only by the air, and similar soil has been reached below the sea level, in pits dug through drifted sand along its margin. Ths land boundaries have been changed and farms diminished, even where the wash of the shore wavss produced no effect. Ths rate of this subsidence is very slow—only a few inches in a century—and it may at any time bs arrested and reversed; but should it continue, as it may, for some thousands of years it would result in a submerging of land now valued at hundreds of millions of dollars and a complete change of position in the seats of commerce and industry, which must always center about this harbor. This possible catastrophe is, however, so uncertain and remote, that it seems hardly sufficient to disturb the equanimity of at least the present generation of inhabitants.

Dr. Gessner in a late letter to the London Geological Society, alluding to the same clase of phenomena, states that in New Brunswick, at St. John's, the land has been elevated, at the Grand Manan Island and the Great Tantamau Marsh, there has been subsidenee; at Bathurst, and on the opposite coast of Lower Canada, the land seems to be rising; in Nova Scotia, near the Bay of Fundy and Mines Basin, thsre is subsidence; but, on the southern side, there are signs of elevation, the sea also rapidly encroaches on Louisberg, in Cape Breton, and in Prince Edward Island, likewise submergence of the land is seen to be taking place at Nantucket, Martha's Vineyard, and Portland, submergeuce of the land is proceeding, locally, at the rate, probably, of four feet in 60 years.

New Instrument to Determine the Presence of Metals in Ores.

At a recent meetiug of the Philadelphia Academy of Natural Sciences, Prof. George A. Koenig, of the University of Pennsylvania, exhibited his recently invented "chromometer," an instrument designed for the purpose of making exquisitely delicate determinations of the presence of certain metals in ores. It is based upon the optical fact that complimentary colors will extinguish each other if mingled in proper proportions; for instance, if to a green solution a red solution be added, the liquid, if the proper conditions be complied with, will become colorless. The speaker had applied this principle to the colors which certain metals, as iron, manganese, copper, etc., produce when fused with horax, which is the only chemical used in this method of analysis. He prepares such glasses or beads containing known quantities of a metal in one hundred parts, and observes how thick a glass of the complimentary color must be to produce extinction. To accomplish this the instrument ie furnished with a glass wedge of a green or red color, cut at an angle of about one degree. By moving this wedge before the glass bead, with the help of a suitahle rack movement, a scale moves at the same time, and when the point of extinction of color is arrived at, the reading of the scale refers to a table showing the percentage of metal contained in the examined substance. By this method of analysis a correct determination of manganese in an iron ore can he made in 15 minutes, which is not more than one-third the time required hy the usual methods of analysis.

The New Metals.

Gallium—Lecoq de Boisbaudran and E. Jungfleisch have published in *Comptes Rendus* some more notes on their examination of the properties of this newly-discovered and curious element. The metal crystallizes in octahedra with the summits of the pyramid cut off by a plane, in some cases truncated so as to give the crystals a tabular form. The metal is hard and only to a small degree malleahle, although thin plates may be bent backwards and forwards many times without breaking. A ray of light which has been reflected several times from bright surfaces of the metal acquires a fine bluish-green color.

The New Metal Philippium—Mr. W. G. Brown, of the East Tennessee University, writes to the *Chemical News*, that while analyzing *sipylite*, a year or more ago, he observed, with tbe spectroscope, certain lines, one at least of which appears to belong to the new metal philippium, and indicates the presence of that element in sipylite.

A Rare Mineral.—Mr. Edward Goldsmith exhihited, at a late meeting of the Philadelphia Academy of Sciences, a specimen of asphaltum found 16 feet helow the surface in a bed of cretaceous marl near Vincenttown, N. J. In the same bed and within a few feet of the asphaltum was found a yellow mineral resiu of the nature of krantzite (first described by Bergeman as occurring at Nienberg, Germany), a species of amber, and containing small white crystals, believed to be succinelliuite. This is the first time that either of these minerals has been found in New Jersey.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Feb. 27.		Week Ending Mar. 6.		Week Ending Mar. 13.		Week Ending Mar. 20.	
Alpha	21	18¼	20	17¼	19¾	18	21½	19¼
Alta	6⅞	5¼	5⅞	5	5½	5	6½	5¼
Andes	60c	50c	50c	45c	50c	40c	50c	40c
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	1.40	1	1.35	1.10	1.45	1.30
Atlantic	....	....	....	....	..	....	....	....
Aurora Tunnel	....	....	....	....	....	....	75c	....
Baltimore Con	1¼	1	....	....	....	....	1	....
Belcher	7¼	6¼	6⅞	6	9	6⅞	9⅜	8¼
Belmont	50c	40c	50c	45c	1	40c	70c	50c
Best & Belcher	24	24¼	20	17⅞	19½	17⅞	21¾	18¼
Bullion	7⅞	6⅞	6¼	4	6	5¼	6½	5⅝
Bechtel	75c	50c	85c	50c	75c	60c	2.60	1.20
Belle Isle	30c	....	35c	30c	35c	30c	35c	....
Bodie	7⅜	6⅞	7	6	6½	5¼	6⅞	5½
Benton	5	4.40	4⅛	3.90	4.20	3¾	5	4
Bulwer	20	18	19½	17¼	18	15	17	16¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.40	85c	2	1.40	2⅞	1.60	4½	2¼
Belvidere	60c	40c	85c	50c	65c	60c	75c	50c
Booker	50c	40c	1	40c	1	60c	1	80c
Caledonia	2⅞	2.55	3⅜	2	3.20	2.70	3¼	2.70
California	7⅞	5⅞	6½	5⅝	6	5⅜	6	5⅝
Challenge	3.70	3	3	2¼	3½	2.65	3.65	3
Chollar-Potosi	49	46	46	39½	45	39½	51	45
Comanche	....	....	....	....	....	....	....	....
Confidence	16½	14	14¼	12¼	15½	13	18½	15½
Con Imperial	1.30	1.15	1.15	1	1.40	1	1.60	1.35
Con Virginia	7¼	5⅞	6¼	5⅞	5⅞	5¼	6	5⅞
Crown Point	5⅞	4⅞	5⅞	4.40	6⅞	4.90	7	6⅞
Con Washoe	....	....	....	....	....	....	....	....
Champion	10c	....	45c	25c	25c	20c	50c	25c
Concordia	....	....	25c	15c	....	....	50c	20c
Dayton	....	....	50c	....	....	....	....	....
DeFrees	10c	....	5c	....	....	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	30c	....	30c	25c	35c	30c	35c	30c
Eureka Con	29	27½	29	27½	28	27½	27	24
Exchequer	7½	5½	5½	4.80	5½	4⅞	5⅞	5
Endowment	15c	5c	10c	5c	5c	....	5c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	5	4.60	4.80	4½	5¼	4.55	4.60	4¼
Gila	30c	5c	30c	25c	30c	....	30c	25c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10	9	10	9	58c	50c	10	9
Goodshaw	50c	....	60c	45c	55c	25c	1¼	45c
Gould & Curry	13⅞	11⅞	11¼	9¼	10⅝	9¼	12¼	10⅛
Hale & Norcross	17½	15⅞	16¼	14¼	17	14	18½	16
Hillside	2.65	2.40	2.60	2¼	2.60	2½	2½	2⅛
Highbridge	80c	60c	75c	55c	60c	55c	60c	50c
Homestake	....	....	....	....	....	....	....	....
Hussey	30c	25c	20c	....	15c	....	20c	15c
Independence	1.80	1⅞	1.60	1.35	1.90	1.60	1.85	1.70
Julia	5⅞	5⅛	5⅞	4.60	5⅞	5½	5⅞	5⅛
Justice	5½	4	4½	4	4.30	4	4½	4.10
Jackson	7¼	7	7½	7	8	7¾	7½	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5⅞	4⅞	5⅜	4½	5⅜	4⅞	6⅛	5¼
Kossuth	25c	....	....	....	15c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.95	1⅝	1.65	1	1.30	1.10	1.55	1.20
Lady Wash	1.70	1¼	1.45	1	1.20	1.10	1.65	1¼
Leopard	85c	50c	85c	70c	80c	75c	90c	80c
Leviathan	65c	50c	50c	40c	35c	25c	35c	30c
Leeds	1	60c	1	70c	70c	....	60c	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	25c	....	50c	25c
Modoc	10c	5c	10c	....	10c	....	55c	10c
Manhattan	2.90	2½	2½	1½	1.60	1⅛	2	1⅞
Martin White	6	5⅝	7	6	7	6⅞	7	6⅞
McClinton	75c	60c	90c	75c	80c	60c	2½	95c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	47½	39½	43	37⅞	41	36½	41½	37½
Mides	....	....	1¼	....	....	....	....	....
Morning Star	....	....	3	....	....	....	....	....
North Con Virginia	14⅞	10	12½	10½	13	10½	11½	9⅞
New York	65c	45c	50c	30c	50c	25c	60c	40c
Northern Belle	10	8	9½	9	10½	9⅞	11¼	10⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	15c	20c	15c	30c	25c	40c	30c
Occidental	....	....	....	....	....	....	....	....
Ophir	43½	40	41¼	35½	37	34⅞	36½	33¼
Oriental	20c	15c	15c	5c	10c	5c	25c	5c
Overman	10⅞	9½	12⅞	10⅞	12⅞	11½	14	11⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	2	....	....	....	....	....
Phil Sheridan	50c	40c	45c	25c	40c	35c	40c	25c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6¼	5	6	5	6⅞	6	6½	6¼
Richer	1	....	1	75c	75c	65c	1	75c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13⅞	13	13½	11⅛	14	11	16	13⅛
Seg Belcher	27	....	....	....	27	25	36	30
Sierra Nevada	57	47⅞	48⅞	45	47	44⅞	49⅞	45½
Silver Hill	2½	2	2¼	1.95	2.20	1.90	2¼	1.90
Silver King	10	9¼	8½	....	8½	8	8½	....
Silver Prize	10c	....	....	....	....	....	....	....
Succor	60c	45c	50c	30c	50c	40c	45c	40c
Summit	3¼	2.30	3	2.15	2½	2	2⅞	2
Scorpion	1.70	1½	1½	1	1.60	1¼	1.35	1
Solid Silver	60c	55c	65c	40c	50c	40c	45c	40c
South Bodie	30c	....	30c	....	30c	25c	1	40c
South Standard	....	....	....	....	....	....	30c	5c
Star	75c	70c	60c	....	60c	50c	65c	60c
St. Louis	50c	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1⅞	1¼	1⅞	1.40	1⅞	1.55	2.90	1.70
Tiptop	1	90c	90c	70c	65c	55c	80c	60c
Trojan	30c	25c	50c	25c	25c	20c	25c	20c
Union Con	90	67½	76	68	76½	66	77	69
Utah	20	16¼	17	13½	18	13½	20	17⅛
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.05	1.35	1.55	1.20	1⅞	1.40	1.70	1.40
Wells-Fargo	15c	....	20c	15c	15c	5c	20c	15c
Woodville	25c	....	25c	....	....	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	22½	20	19	17	20	16⅞	20⅞	17⅛

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 14.
600 Andes...50c
130 Alta...5¼
20 Alpha...21½@21
220 Best & Belcher...20
470 Bullion...6⅞@6⅛
1250 Belcher...9½@9⅝
900 Benton...4@4.10
1670 California...6@5⅞
1035 Crown Point...7@6⅞
3565 Con Imperial...1.55@1½
485 Caledonia...3.10@3.15
360 Confidence...16½@18½
325 Challenge...3.60@3.65
275 Chollar...49@50
2665 Con Virginia...5⅞@6
1580 Dardanelles...1¼@1.30
965 Exchequer...5¼@5⅞
425 Flowery...75@80c
200 Gould & Curry...10⅞@10⅞
480 Hale & Nor...17@17¼
520 Justice...4.30@4½
155 Julia...5⅞
630 Kentuck...5½@5
980 Lady Bryan...1¼@1.30
125 Lady Wash...1¼
500 Leviathan...35c
20 Mexican...41½
200 Mackey...3.90@3.85
200 North Con Vir...11@11¼
550 N Bonanza...1⅞@1.90
700 New York...50@45c
255 Overman...13¼@13⅞
150 Ophir...35½@35⅞
400 Phil Sheridan...40c
140 Sierra Nevada...49⅞@49¼
560 Savage...13½@14¼
115 S Potosi...2.10
720 Silver Hill...2¼
500 Solid Silver...40@45c
350 Succor...40c
150 Scorpion...1¼
20 Seg Belcher...35@36
1800 Trojan...20c
80 Utah...18½@18½
275 Union Con...77
300 Wells-Fargo...15c
415 Ward...1.70
190 Yellow Jacket...20⅞@20¼

AFTERNOON SESSION.
2170 Argenta...1.40@1.30
200 Albion...25@30c
1900 Belmont...65@55c
1185 Bechtel...1.20@1¼
115 Bodie...6
350 Belvidere...60@55c
290 Bulwer...16¼@16½
2115 Black Hawk...2.90@3
100 Belle Isle...35c
800 Booker...85@80c
100 Champion...25c
500 Concordia...25c
325 C Pacific...1.90@2
200 Caledonia (B H)...1.90
300 Dudley...75c
380 Day...35@30c
150 Esmeralda...1
100 Endowment...5c
450 Goodshaw...45c
405 Grand Prize...4½@4.60
100 Golden Terra...9½@10
250 Hamburg...50c
50 Hillside...2½
400 Highbridge...60@55c
270 Independence...1.80@1⅞
190 Jackson...7½@7
690 Leopard...80c
500 Leeds...60c
1240 McClinton...75@90c
50 M White...6⅞
765 Mono...2¼@2.60
30 Manhattan...1⅞
100 Minnietta Bell...40c
280 Northern Belle...10⅞@11
150 Navajo...30c
90 Oriental...5c
350 Paradise...1⅞@1.80
100 Raymond & Ely...6¼
300 Richer...75@80c
200 Star...60c
290 Silver King...8½
950 S Bodie...50@65c
370 Summit...2.40@2.30
1450 S Bulwer...90@75c
530 S Standard...5c
175 Tiptop...65c
1140 Tuscarora...5@10c
120 Tioga Con...1.70@2
300 University...40c

Saturday A.M., Mar. 15.
110 Alpha...21
230 Alta...5⅞@5⅞
525 Argenta...1.40
200 Best & Belcher...20⅞@20¼
1055 Belcher...9¼@9
400 Bullion...6⅞@6¼
250 Booker...80c
5 Bodie...6
470 Benton...4.35@4½
280 Bulwer...16½@16⅞
150 Belvidere...50@60c
3720 Bechtel...2.30@2.40
40 Belmont...50c
1380 Black Hawk...4½@4
100 Con Esmeralda...80c
2740 Con Virginia...5⅞@5⅞
415 California...5⅛@5⅞
290 Confidence...18@16⅞
130 Chollar...50
425 Crown Point...6⅞@6⅞
2225 Con Imperial...1.55@1.60
200 Concordia...20c
100 Champion...25c
670 Challenge...3½@3.40
150 Caledonia...3.20
180 C Pacific...1.95@1.90
320 Chieftain...15@25c
480 Dardanelles...1¼
300 Dudley...80c
660 Exchequer...5⅞@5⅝
10 Eureka Con...26¼
300 Flowery...80c
400 Gila...30@25c
490 Gould & Curry...11⅞@11¼
10 Grand Prize...4½
750 Goodshaw...50c
390 H & Norcross...17⅞@18
300 Hussey...15c
100 Hamburg...50c
300 Highbridge...50@55c
150 Hillside...2½
50 Independence...1.70
125 Justice...4½@4.40
560 Julia...5⅛@5⅝
150 Jackson...7
260 Kentuck...6@6¼
300 Leviathan...35@30c
335 L Bryan...1.30@1.40
125 Lady Wash...1¼
120 Leeds...55@60c
20 Leopard...80c
405 Mexican...40½@40¼
250 Mackey...3.90@3.95
80 M White...7
50 Manhattan...1.90
290 Mono...2⅞@3
450 McClinton...1@95c
1140 New York...50@55c
160 N Con Virginia...11¼@11½
405 N Bonanza...1.85@1.90
260 Northern Belle...10⅝@11
400 Noonday...2
230 Ophir...36¼@36
160 Overman...13⅞@13⅞
1400 Oriental...10c
530 Phil Sheridan...35@40c
300 Paradise...1⅞@1.70
40 Raymond & E...6½
455 Savage...14½@14⅞
500 Succor...40c
20 Sierra Nevada...48
500 Silver Hill...2¼@2.20
40 Seg Belcher...32@33½
900 Solid Silver...45c
100 Star...65c
110 Scorpion...1.20@1¼
100 S Potosi...2.10
700 S Bulwer...80@85c
100 South Bodie...85c
270 Summit...2.40@2.30
400 Tuscarora...5c
1100 Trojan...25@20c
100 Tiptop...60c
485 Tioga...2@2.30
40 Union Con...75
130 Utah...18
600 University...55@60c
495 Ward...1.65@1.60
360 Yellow Jacket...20½@20¼

Monday A. M., Mar. 17.
260 Alta...5⅞@5⅞
75 Alpha...20½
110 Andes...40c
115 Best & Belcher...21@21⅞
595 Belcher...9@9⅛
730 Bullion...6¼@6
120 Benton...4½
140 Chollar...51@50½
175 California...5⅞
430 Con Virginia...5⅞@6
445 Crown Point...6⅞@6½
2090 Con Imperial...1.45@1½
200 Challenge...3.40
345 Caledonia...3½@3.20
130 Confidence...17¼@16
710 Dardanelles...1¼@1.20
225 Exchequer...5¼@5⅞
1110 Flowery...80@85c
1340 Gould & Curry...12@11⅞
280 Hale & Nor...18@18¼
130 Justice...4.30
500 Julia...5⅞
25 Kentuck...6
1060 Lady Bryan...1.45@1.55
750 Leviathan...35@30c
370 Lady Wash...1½@1.60
380 Mexican...40@39½
270 Mackey...4.05@4
570 New York...50@60c
260 North Con Vir...11@10⅞
450 N Bonanza...1⅞@1.95
185 Ophir...35
220 Overman...13½@14
100 Plutus...1½@1.60
1275 Phil Sheridan...40@35c
510 Solid Silver...40@45c
570 Savage...16@14⅞
390 Sierra Nevada...47
385 Silver Hill...2⅛@2.15
100 Santiago...2
300 Succor...45@40c
25 Seg Belcher...30
50 Scorpion...1
1350 Trojan...20c
60 Utah...18⅞
35 Union Con...74
790 Ward...1.65@1.60
660 Yellow Jacket...18¼@17½

AFTERNOON SESSION.
300 Albion...30c
3115 Argenta...1.40@1.45
210 Belmont...55@70c
300 Bodie...6½@6⅞
2400 Bechtel...2½@2.60
1625 Booker...90c@1
1670 Belvidere...60@55c
80 Bulwer...16⅞
1555 Black Hawk...3@3.10
600 Champion...50@40c
600 Caledonia (B H)...2¼
400 Chieftain...15@10c
1160 Dudley...1@1¼
600 Esmeralda...75c
95 Eureka Con...27
150 Endowment...5c
10 Grand Prize...4½
200 Gila...30c
1500 Goodshaw...75c@1¼
15 Golden Terra...9⅞
150 Hussey...20c
1800 Hamburg...50c
60 Hillside...2½
600 Highbridge...60c
510 Independence...1⅞@1.85
460 Jackson...7
2750 Leopard...80c
300 Leeds...60@50c
150 Mono...2.80@2.60
200 Minnietta Belle...50@55c
740 McClinton...2½@2.40
220 Manhattan...1.90@2
100 Modoc...55c
290 Northern Belle...11
950 Navajo...30@40c
225 Noonday...1.90@1½
640 Oriental...15@10c
1400 Paradise...2¼@2.40
80 Raymond & Ely...6½
160 Red Cloud...1
1000 Richer...90c@1
500 Star...60c
1950 S Bulwer...1.05@1¼
605 Summit...2⅞@2.60
100 Silver King...8½
1050 S Standard...15@25c
1050 S Bodie...70c@1
2100 Tuscarora...10c
1770 Tioga Con...2⅞@2.90
800 Tiptop...60c
1200 University...70@75c

Tuesday A. M., Mar. 18.
315 Alta...6½@6⅞
150 Alpha...20⅞@21
100 Andes...50c
455 Best & Belcher...20½@20¼
1055 Belcher...9½@9⅜
260 Bullion...6¼@6⅞
300 Baltimore Con...1
830 Benton...4⅞@5
95 California...5⅞
90 Caledonia...3.20
1410 Con Virginia...5⅞@6
1725 Con Imperial...1.55@1.60
240 Chollar...50@49
1765 Crown Point...6½@6⅞
145 Confidence...17⅞@17¼
1100 Challenge...3⅛
600 Dardanelles...1½@1.35
250 Exchequer...5⅝
1325 Flowery...85@90c
870 Gould & Curry...12¼@12
545 H & Norcross...18½@18¼
260 Justice...4¼@4.20
380 Julia...5⅞@5⅞
285 Kentuck...6
1540 Lady Bryan...1.45@1½
230 Lady Wash...1.65@1.60
450 Leviathan...35@30c
400 Mexican...40⅞@41¼
600 Mackey...4½@4.15
270 New York...55c
425 North Con Vir...11@10⅞
400 N Bonanza...2@1.95
375 Ophir...36@35⅞
50 Overman...14
300 Phil Sheridan...35c
150 S Potosi...2¼@2.20
215 Sierra Nevada...48
620 Savage...15¼@14⅞
695 Silver Hill...2@2.05
1050 Succor...40c
300 Solid Silver...40@45c
160 Scorpion...1¼
5 Seg Belcher...30
300 Santiago...2
3610 Trojan...20c
170 Utah...20@19⅞
210 Union Con...74½@75½
295 Woodville...25c
600 Wells-Fargo...20@15c
320 Ward...1.65@1.70
150 Yellow Jacket...18½

AFTERNOON SESSION.
895 Argenta...1.40@1.35
850 Albion...30@40c
200 Aurora T...75c
2305 Booker...90c@1
605 Bodie...6¼@6½
1040 Bechtel...1.80@1.90
1550 Belvidere...75@65c
35 Bulwer...17
600 Belmont...55c
400 Belle Isle...35c
1000 Black Hawk...2.40@2¼
1800 Champion...30@40c
500 Concordia...50c
600 C Pacific...2@2.15
1500 Chieftain...15c
440 Caledonia (B H)...2@2⅛
200 Day...30c
875 Dudley...1
500 Esmeralda...75c
55 Eureka Con...26@25¼
1275 Endowment...5c
50 Giant & O A...5
200 Goodshaw...60c
205 Grand Prize...4.55
50 Hussey...20c
200 Hillside...2¼@2¼
1860 Hamburg...50c
550 Highbridge...60@55c
60 Jackson...7
300 Jupiter...1¼
720 Leopard...80c
1000 Leeds...60c
140 Manhattan...1.90@2
475 May Belle...50@40c
50 Minnietta Bell...50c
570 Mono...2½@2.60
1600 McClinton...1½@1.15
200 Modoc...10c
225 M White...7
10 Northern Belle...11¼
400 Navajo...35@40c
550 Noonday...1⅞@1½
3745 Oriental...15@25c
1340 Paradise...2.40@2½
150 Raymond & Ely...6¼
840 Red Cloud...1.60@1½
380 Richer...90c
300 S Bodie...60@50c
50 Standard...19
275 Silver King...8½
705 Summit...2½@2.65
3560 S Bulwer...90c@1
3300 South Standard...25@30c
900 Tuscarora...10c
185 Tiptop...65c
1310 Tioga Con...1.60@1⅞
2150 University...75@60c

Wed'sday A.M., Mar. 19.
350 Andes...50c
720 Alpha...19½@21
370 Alta...6½@6¼
215 B & Belcher...19
500 Brilliant...75c
560 Bullion...5⅞@5⅝
1645 Belcher...8½@8⅞
310 Benton...4¼
500 Baltimore Con...1
80 Chollar...46@46⅞
840 Con Virginia...5⅞@5¼
305 California...5⅝
975 Crown Point...6¼@6
360 Caledonia...2.80@2⅞
4725 Con Imperial...1.45@1.40
30 Confidence...16
340 Challenge...3.40
700 Dardanelles...1.30@1.35
620 Exchequer...5⅞@5¼
750 Flowery...75@80c
805 Gould & Curry...10½@10¼
1015 Hale & Nor...16⅞@17¼
60 Justice...4¼@4.20
250 Julia...5½@5⅞
315 Kentuck...5⅞
100 Leviathan...35c
1000 Lady Bryan...1.20@1¼
45 Lady Wash...1½
370 Mexican...38@38¼
330 Mackey...4@4.10
130 North Con Vir...10@10½
1215 New York...55@50c
615 N Bonanza...1⅞@1.85
240 Overman...12½@12¼
565 Ophir...34@33½
700 Phil Sheridan...30c
250 Succor...40c
790 Savage...13¼@13⅞
320 S Nevada...46@46¼
850 Solid Silver...40c
275 Silver Hill...2@2.10
120 S Potosi...2.20
200 Santiago...1⅞
50 Scorpion...1.35
425 Trojan...20c
60 Utah...18@17⅞
665 Union...71½@70½
2730 Wells-Fargo...15c
300 Ward...1.55@1.60
445 Yellow Jacket...18@18½

AFTERNOON SESSION.
100 Atlas...11c
380 Argenta...1.30@1.35
120 Bulwer...16⅞@17
880 Bechtel...1.90@1.95
20 Bodie...5½
665 Black Hawk...3@2.95

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery s
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3	20	Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
Caledonia S M Co	Nevada	26	50	Jan 31	Mar 7	Mar 28	W Wegener	414 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 11	May 3	T E Atkinson	318 Pine st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Gila S M Co	Nevada	3	25	Jan 22	Mar 3	Mar 24	Wm W Parish	328 Montgomery st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leopard M Co	Nevada	9	50	Jan 3	Feb 6	Mar 28	R H Brown	327 Pine st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Mar 22	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
Overman S M Co	Nevada	43	3 00	Jan 28	Mar 5	Mar 26	Geo D Edwards	414 California st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redington	111½ Leidesdorff st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argent M Co	Nevada	4	30	Jan 21	Mar 3	Mar 25	R H Brown	327 Pine st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Booker Con G M Co	California	1	15	Jan 29	Mar 6	Mar 26	W H Lent	309 Montgomery st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 27	Apr 12	J T McGeoghegan	318 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 16	——	Mar 29	N C Walton, Jr	324 Pine st
Hanover Con M Co	California	2	25	Jan 30	——	Mar 24	Wm A Andoe	327 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
Mount Hood M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
North Star G M Co	California	1	50	Jan 29	Mar 5	Mar 26	D A Jennings	401 California st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 28	Apr 15	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Taul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Easton	22 Montgomery st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 8	R N Van Brunt	318 Pine st
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	Mar 19	Wm H Lent	309 Montgomery st
University G M Co	California	1	10	Mar 1	Apr 6	Apr 26	Wm Letts Oliver	328 Montgm'y st
Vancouver M Co	Nevada	2	15	Feb 3	Mar 8	Mar 28	W W Bausman	409 California st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Ætna M Co	Arizona	J S Benear	420 Montgomery st	Annual	Mar 24
American Flag M & M Co		Geo R Spinney	310 Pine st	Annual	Mar 27
Armand G & S M Co	California	J L Fields	240 Montgomery st	Annual	March 27
Atlanta M Co	Utah	E B Jago	420 Montgomery st	Annual	April 5
Buckeye G & S M Co	California	C A Sankey	331 Montgomery st	Annual	March 28
Equitable T & M Co		Charles J Collins	227 Montgomery st	Annual	Mar 21
Gold Deposit G & S M Co		J M Buffington	309 California st	Annual	Mar 31
Maryland Con G & S M Co	California	J T Gayson	419 California st	Special	March 22
Melones Con M Co	California	A Noel	419 California st	Annual	March 25
Modock Con M Co	California	J W Pew	310 Pine st	Special	Apr 7

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Mar 20
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Mar 12

1000 Booker...90@95c
1515 Belvidere...60c@1.10
1000 Champion...30@40c
300 Caledonia (B H)...2
450 C Pacific...2.20@2.15
700 Chieftain...15c
100 DeFrees...10c
150 Day...35c
780 Dudley...75c@1
145 Eureka Con...24⅞@24
600 Esmeralda...1
850 Endowment...5c
300 Gila...30c
295 Grand Prize...4.40@4¼
660 Goodshaw...65@75c
50 Golden Terra...9
500 Hamburg...50@55c
450 Highbridge...60@55c
295 Independence...1⅞@1.80
500 Ida...1
800 Leopard...85@90c
400 Leeds...60c
450 McClinton...1⅞@1.30
100 Manhattan...2
1050 May Belle...45@25c
100 M White...7
680 Mono...2¼@2.60
60 Northern Belle...11
300 Navajo...40@35c
100 Noonday...1½
1875 Oriental...20@25c
700 Paradise...2½@2.40
150 Raymond & Ely...6¼@6½
1200 Red Cloud...1@1.10
100 Richer...80c
400 Senator...20@18c
200 Santiago...2½
400 S Utah...7@9c
1000 S Bodie...40@50c
1100 Summit...2@2.40
200 S Standard...25@30c
550 S Bulwer...90@85c
45 Standard...20
200 Star...60c
135 Trojan...25c
210 Tiptop...70@80c
1020 Tioga Con...1⅞@1.80
1800 University...50c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Mar. 13.
75 Alta...5¼
400 Andes...50@45c
140 Alpha...19⅞@19½
1195 Belcher...9@8⅞
660 Bullion...5⅞
28 Benton...3⅞
800 Brilliant...75c
430 California...6@5⅞
460 Con Virginia...5½
1715 Crown Point...6½@6
70 Chollar...45@44½
1650 Con Imperial...1.40@1.35
330 Confidence...15½@15
270 Caledonia...3@2.95
590 Challenge...3¼@3.35
1400 Dardenelles...1¼@1.15
1915 Exchequer...5½@5¼
250 Flowery...85@75c
199 Gould & Curry...10⅞@10¼
150 Hale & Nor...16½
205 Justice...4.20@4.10
565 Julia...5⅞
70 Kentuck...5⅞@5¼
30 Lady Wash...1.10
510 Lady Bryan...1.10
515 Leviathan...35@30c
225 Mexican...39⅞
150 Mackey...3.85@3.80
200 New York...40c
225 North Con Vir...11½@11
285 N Bonanza...1.70
500 N Sierra Nevada...5c
266 Ophir...35⅞@34⅞
250 Overman...12⅞@12½
100 Phil Sheridan...35c
30 Seg Belcher...27@25
125 Sierra Nevada...47@46½
70 Savage...13½
255 Succor...45@40c
405 Silver Hill...2.05@1.90
50 Scorpion...1½
400 Solid Silver...45c
80 S Potosi...2.05
500 Trojan...20c
60 Union Con...73½
70 Utah...18@17⅞
200 Wells-Fargo...15c
200 Ward...1.65@1.60
230 Yellow Jacket...20@19½

AFTERNOON SESSION.
1325 Argenta...1.35@1.40
300 Belle Isle...30c

Thursday A.M., Mar. 20.
370 Alta...5⅞@5½
300 Alpha...21@20⅞
100 Andes...45@40c
200 Best & Belcher...18½@18¼
330 Bullion...5⅞@5⅝
600 Belcher...8⅞@8¼
570 Benton...4¼
270 Caledonia...2.70
1570 Con Imperial...1.35
150 Chollar...45
595 California...5⅞@5⅞
450 Challenge...3
780 Con Virginia...5⅞
30 Confidence...15⅞@15½
800 Crown Point...5⅞@5⅞
1700 Dardanelles...1
450 Exchequer...5
270 Flowery...75c
1055 Gould & Curry...10½@10⅛
680 Hale & Nor...16½@16
365 Justice...4¼@4.10
775 Julia...5¼@5½
260 Kentuck...5¼
950 L Bryan...1.20
500 Leviathan...35@30c
610 Mexican...38@37½
200 Mackey...4
1140 New York...45@40c
275 N Con Virginia...10@9⅞
350 N Bonanza...1⅞
440 Ophir...34@33¼
165 Overman...11⅞
400 Phil Sheridan...30@25c
255 Sierra Nevada...45½
525 Savage...13¼@13⅛
310 Scorpion...1¼@1.20
370 Silver Hill...2@1.90
160 Senator...10c
960 Succor...40@35c
500 Solid Silver...40c
130 S Potosi...2.20
600 Trojan...25@20c
40 Utah...16
395 Union Con...70½@69
500 Wells-Fargo...15c
920 Ward...1.45@1.40
765 Yellow Jacket...17⅞@17½

AFTERNOON SESSION.
830 Argenta...1.15@1.30
100 Albion...40c
2055 Belvidere...1.45@1.70
210 Bodie...6½@6¼
165 Bulwer...16⅞@17
205 Black Hawk...3¼@3½
1180 Bechtel...1.60@1.90
150 Belle Isle...35c
100 Booker...90c
400 Chieftain...15c
230 C Pacific...2.15@2¼
100 Bulwer...16¼@16⅞
125 Bodie...5½@6
1525 Bechtel...1.30@1.40
2775 Belmont...75@85c
225 Belvidere...50@60c
520 Black Hawk...2.60@2.70
770 Booker...80@75c
140 C Pacific...1⅞@1.90
200 Caledonia (B H)...1.90
200 Defiance...90c
450 Dudley...75c
195 Eureka Con...26¼@26
100 Goodshaw...50c
225 Grand Prize...4.60
260 Giant & O A...4⅞@5
50 Gila...30c
400 Hamburg...50@60c
635 Highbridge...60c
50 Independence...1.70
50 Jackson...7½
230 Leopard...85c
100 Leeds...70c
15 Martin White...6⅞
665 Mono...2.40@2½
255 Manhattan...1⅞@2
950 McClinton...70@75c
240 Northern Belle...10⅝@11
50 Oriental...5c
350 Paradise...1.60
400 Richer...70@75c
120 Raymond & Ely...6¼
150 Silver King...8⅞
1750 S Bulwer...80@90c
1010 S Bodie...25@35c
400 Star...50@55c
50 Summit...2.40
6325 Tuscarora...5@10c
450 Tioga Con...1⅞
100 Tiptop...65c
1500 Champion...35@40c
300 Concordia...20c
200 DeFrees...5c
3200 Day...30@35c
930 Dudley...50@80c
445 Eureka Con...22
1000 Endowment...5c
175 Grand Prize...4¼
1050 Gila...25@30c
390 Goodshaw...70@75c
150 Hamburg...60c
100 Hussey...25c
150 Highbridge...50@55c
50 Independence...1.70
600 Ida...5c@1
300 Jackson...5½
50 Jupiter...1
760 Leopard...90@95c
405 Mono...2¼@2.15
200 Manhattan...1.90
870 Minnietta Bell...10½
300 McClinton...1.30@1.40
130 Northern Belle...10½
350 Navajo...40@35c
250 Noonday...1@1¼
905 Oriental...10@5c
300 Paradise...2.35
500 Raymond & Ely...6¼@6½
690 Red Cloud...95c@1
300 Richer...70c
1690 Summit...2½@2.40
580 Star...60@50c
2550 S Bodie...40@50c
1000 South Standard...25@30c
980 S Bulwer...90c@1
505 Tiptop...1@1.10
530 Tioga Con...2.15@2
200 Tuscarora...5c
1475 University...50c

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 19.
30 Alpha...21@21½
100 Alta...6¼
315 Belcher...8⅞@8⅞
70 Bullion...5½@5⅞
165 Best & Belcher...19¼@19½
350 Con Virginia...5⅞@6
1950 Con Imperial...1½@1.45
150 Crown Point...6½
100 Caledonia...2⅛
160 California...5.80@5¼
70 Challenge...3.40
10 Chollar...47
120 Exchequer...5⅝
90 Gould & Curry...10⅞@11
25 Hale & Nor...17@17¼
200 Justice...4.20
270 Julia...5⅞@5½
80 Mexican...39@39¼
95 Ophir...34
65 Overman...12¼
80 Savage...14@13⅞
15 Sierra Nevada...46
100 Silver Hill...2.05
30 Utah...18½@18⅞
30 Union Con...71
110 Yellow Jacket...18⅛

AFTERNOON SESSION.
160 Andes...45c
200 Belcher...8.60@8¼
60 Bullion...5.80@5¼
40 Benton...4½
20 Bodie...6
10 Best & Belcher...18⅞
20 Caledonia...2.85
120 Con Imperial...1.45
35 Con Virginia...5⅞@5⅞
30 Crown Point...5⅞
150 Chieftain...15c
50 Eureka Con...25
600 Endowment...5c
50 Exchequer...5¼
105 Gould & Curry...10½@10⅝
50 Goodshaw...75c
130 Geo Douglas...30c
10 Hale & Nor...16⅝
90 Julia...5½@5⅝
100 Justice...4¼
50 L Bryan...1¼
150 Lady Wash...1½
75 Mackey...4
30 Mexican...38⅞@38½
110 New York...50c
200 Paradise...2½
120 Phil Sheridan...30c
200 S Utah...11c
20 Savage...13⅞
50 Silver Hill...2.05
60 Summit...2.40
80 Ward...1.60
700 Wells-Fargo...15c
10 Yellow Jacket...17⅞

California Board—Latest Sales.

Wed'sday A.M., Mar. 19.
30 Alpha...20
20 Alta...6⅞
100 Andes...50c
30 Best & Belcher...19½
30 Belcher...8⅞
40 Bullion...5⅞
40 California...5¼
40 Con Virginia...5⅞
200 Con Imperial...1.45
40 Crown Point...6¼
130 Caledonia...3

40	Cbollar	.46	100	Atlanta	3c
30	Challenge	3.30	400	Almaden Q	90@75c
100	Crœsus	25c	30	Argenta	1.35
45	Exchequer	5¼	120	Black Hawk	2.95
250	Favorite	72½@70c	30	Bullion	6@6.05
100	Fairfax	70c	30	Best & Belcher	19¼
30	Gould & Curry	11	40	Belcher	8¼
55	Hale & Norcross	16¼@16¼	40	Caledonia	3
80	Justice	4¼@4.20	100	Concordia	15c
45	Julia	5¼@5¼	500	Coso Con	5c
20	Lady Bryan	1¼	40	Con Virginia	5¼
40	Mexican	39¼	40	Crown Point	6¼
100	Monumental	2c	300	Con Imperial	1¼@1.45
50	New York	50c	40	California	5¼
300	North Carson	17½c	30	Chollar	.46
100	N Scorpion	7½c	200	Enterprise	1
30	Ophir	35	40	Exchequer	5¼
700	S Utah	8@10c	50	Gould & Curry	10¼@10
50	Savage	14@14¼	30	Hale & Nor	16¼
120	Silver Hill	2	170	Julia	5¼@5¼
20	Sierra Nevada	46	40	Justice	4¼
150	S Europa	35c	40	Mexican	38¼@38¼
200	Trojan	20@21c	30	North Con Vir	10¼
1500	Twin Peaks	4@2c	40	Ophir	34
2200	U Flag	1@2c	60	Raymond & Ely	6¼@6¼
30	Union	71¼	30	Savage	13¼
220	Wm Penn	6c	20	Sierra Nevada	46
20	Yellow Jacket	18	50	Scorpion	1¼
	AFTERNOON SESSION.		120	Tiger	1.10
40	Alpha	22	150	Wales	1¼
60	Alta	6¼@6¼	30	Yellow Jacket	17¼@17¼

Mining Share Market.

We have had a comparatively strong, firm week in stocks, but toward the close there was a slight falling off in the prices. The live opening of the week was sudden and unexpected, for up to that date the market had been apathetic and insipid.

The feature of the market was the move in Belcher, which relieved the monotony of operations in Virginia shares, advancing nearly a dollar. This advance was kept firm till the latter part of the week, when it slightly shaded off in sympathy with other stocks. There has also heen some excitement in Bodie mines, the Blackhawk, Bechtel and McClinton receiving the most attention. The rise was too unhealthy to be lasting, however, and on Wednesday they took a tumhle and are rapidly seeking the figures from which they were so suddenly called. The distrust and uncertainty concerning the Sutro compromise, has had a tendency to weaken prices somewhat, though the news of the late definite settlement has produced a better feeling in the market. The mines all over the State are peculiarly active, the late rains making water plentiful and work possible both for quartz and placer claims.

Silver-Plated Amalgamated Plates.

The following letter from a well-known manufactnrer of silver-plated amalgamating plates for miners' use will be of interest, explaining as it does the action of these plates:

Milton Kelly, Esq., Boise City, Idaho:—Dear Sir: In a recent copy of your paper I noticed an article stating that ordinary copper plates would prove as serviceahle in saving gold as the silver-plated plates. Such has not heen the result either on Snake river or in placer or quartz mining in California, as I am constantly receiving orders for *silver-plated* plates to replace the copper plates.

The comhination of metals, silver, copper and quicksilver, creates a chemical and electric action, causing a greater attraction for gold than copper and quicksilver alone combined.

The proper test, and it has been tried, is to have one sluice lined wiih copper and another with silver-plated plates, of the same surface. The result has always proved vastly in favor of *silver-plated plates*. The copper plates will, in time, ahsorb considerable gold, but it only accumulates in spots, and very unevenly, leaving some parts of the copper bare. Upon the parts not covered with gold verdigris forms, causing a great deal of labor and trouble.

The advantage of silver-plated plates is that gold can be saved immediately, giving miners the benefit of all the gold deposited in the amalgam, while with copper plates it is absorbed in the copper, and can only be made availahle hy smelting or going through chemical process.

If parties contemplating mining on Snake river will supply themselves with a good quality of silver-plated plates, protect them well from houlders and gravel by screens, and he careful in removing the amalgam, they will have no cause to regret the investment. Miners in the Snake river country should he careful to avoid purchasing inferior qualities of plates, as several parties have had their plates replated at my estahlishment.

Full particulars regarding price and working of these plates freely furnished to any one on application. Yours, truly,

E. G. Denniston.

San Francisco, March 9th, 1879.

Bullion Shipments.

Since our last issue, we have noticed the following hullion shipments:

Hillside, March 13th, $4,840; Tybo Con., March 10th, $8,030.38; Star, March 16th, $14,-400; Christy, March 17th, $5,208; Standard, March 15th, $18,794.99; Martin White, March 16th, $8,314; Bulwer, March 16th, $16,506.08; Northern Belle, March 15th, $9,710.03.

By the fall of a gallery in Gilmore's Garden, at New York, many persons were injured and a frightful panic ensued.

Complete success has attended the French Ministry's opposition to the De Broglie-Rochebonet impeachment.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Items from Oleta.—*Ledger*, Mar. 15: With plenty of water mining industry around Fiddletown has taken a decided start. S. H. Clarke's cement claim is running to the full capacity of the 10-stamp mill to dispose of the gold-bearing earth. From 12 to 16 men are employed constantly. The American Flat Gravel Company's claims are in full blast. The Oleta Gold mining company is the name of a corporation lately formed to operate near Fiddletown. It is to prospect for gold-bearing quartz east of town. Surveyors were set to work in the early part of the week to pave the way for a thorough exploration.

Miscellaneous.—Mr. Dakin has commenced mining operations at Butte mountain. He has plenty of capital behind him to explore the center of the elevation. The plan of operations is to run a tunnel from the side of the mountain. A clean-up was made at the Talisman mine, near Amador City, lately. It paid well. The prospects of the company are more encouraging than they have been at any time since its incorporation.

Mining.—The Illinois quartz mine, two miles north of Plymouth, owned by George Bowden & Co., looks as if it had all the requisites of a good mine. The shaft is down 12 or 15 ft, with a well-defined ledge six ft in width, and fine gouge on the foot wall. Some of the rock has prospected as high as from five to ten cents to the pan. The discovery of this claim has given quite an impetus to prospecting. Quartz claims are being located all around, and the general opinion is that the excitement will lead to the opening up of some permanent mines. The Hercules shaft has been deepened from 25 to 30 ft since they commenced sinking. Some trouble is experienced with the water, especially since the late heavy rains. At the Phœnix things are moving along at the usual gait. Timbers are getting scarce in the yard, but a large number are expected to be floated down shortly. Report says the rock in the mine is as rich as ever. Miners are busy filling up the slopes with waste dirt to prevent caves.

CALAVERAS.

Gravel Mines.—*Chronicle*, Mar. 15: At the Duryea mine, hydraulicing is being prosecuted with vigor. Work is now being prosecuted in the extreme northern end of the claim, a new tunnel having been run for the flume, and the necessary ground sluices cut. The Duryea hydraulic has a pressure of 250 ft, uses from 300 to 500 inches of water, sports a three-ft flume, and goes it on a big scale generally. With the superior facilities for working, an immense amount of gravel is daily put through the flume. The Happy Valley Blue Gravel and Hydraulic mining company's claim on Sport hill is being worked as fast as possible; 500 inches of water are used under a heavy pressure. A three-ft flume conveys away the debris and it is filled to its utmost capacity all the time. A water-power derrick is to be put up in the mine immediately, the quantity of cement encountered rendering it indispensable. No clean-up has yet been made, active operations having been in progress but a short time. George Emerson, the well-known hydraulicist, is Superintendent of the mine. Work is in progress on the tunnel of the Happy Valley Blue Gravel and Hydraulic mining company; a bore that is to extend 2,200 ft through solid bedrock. It is already in 100 ft and expanding as fast as muscle and powder can make it. The rock is getting quite hard—a blackish kind of slate. Mr. W. H. Curnow, a practical miner, in superintending the tunnel proceedings. There is talk of putting a diamond drill, to be run by compressed air, into the tunnel. The Maison de Sante hydraulic, W. W. Cook, proprietor, is being steadily worked, a large force of hands being employed. The gravel looks first-rate. No clean-up has been made this season.

MARIPOSA.

Ferguson Notes.—Cor. *Gazette*, Mar. 15: The prospects of the Ferguson mine are growing brighter every day. They make regular clean-ups, and have commenced to run the north drift at the second station. The ledge is two ft wide, and shows well in free gold and sulphurets. The stopes all look well, with an abundance of gold in sight. The company is going to add 10 more stamps soon, which will be 20 in all, build a water-wheel, erect a compressor, and prepare to sink the No. 2 shaft. At the mouth of the tunnel the rock is coarse but pays from $75 to $100 per ton. This rock comes from the bottom stopes, where there is an abundance of this rich ore. The Virgin Hill Co. is pushing its work, and when the tunnel strikes the ledge and connects with the shaft, they will commence taking out rich rock. The Cranberry is a good mine, and carries with it a well-defined ledge seven feet wide. It pays $10 per ton.

MONO.

Bechtel.—*News*, Mar. 16: On the 400 level, 280 ft south from shaft, after leaving the old Bechtel ore body, the porphyry horse, which has been a nightmare during the past winter was passed through, and a development made in a fine body of ore which averages two ft in width. The new strike has been prospected a distance of 50 ft south, and shows the same width the entire distance. The foot wall of the Bechtel is found pitching east at an angle of about 55°, the strike of the vein being a little east of south. The developments made show an entirely new and hitherto unprospected chute of ore, as the levels above and below have never reached the distance now attained south. The ore now being extracted differs from that formerly found in the Bechtel workings in the fact that it is free from manganese and the glassy, hard quartz found elsewhere. Assays from the new find taken across the face show from $00 to $75 as an average.

Tioga.—Excavating for 520 station. East crosscut on 420 level is now in 125 ft, with no important change to note. From north drift on 320 level the east crosscut is in 50 ft, and the ledge looks promising in the extreme, being two and a half ft in with. West drift on same level is in 240 ft with no material change to mention.

Standard.—North drift from main shaft to connect with incline is in 43 ft. The ledge is two and a half ft wide and looks well. The south drift is in 268 ft; progress during the week 12 ft. The ledge is three ft wide, with good average ore. The ledge in the upraise in this drift is four ft wide and is looking very well. North drift from east crosscut, 300 level, is in 125 ft, showing a ledge 18 inches wide of good ore. North drift on West Standard is in 128 feet. The ledge is two ft wide of very fine ore. A winze has been started on the West Standard ledge, 200 ft from the south line. This winze is down 10 ft, showing a ledge 18 inches wide of very rich ore. The drift on the Cook ledge is in 200 feet from the south line; the ledge is two ft wide and of good average ore. The stopes all looking well.

Black Hawk.—On the 220 level the south drift is now 20 ft in length and the north drift 15. The ledge on both faces looked quite as strong as at any point since the ledge was struck. At 320 level a station has been cut and a crosscut west has been commenced, and a distance of 70 ft will have to be run to demonstrate the existence of those ledges which have already created so much excitement. New buildings are being erected over the shaft.

Summit.—Drifts being advanced on the ledge both north and south in the incline shaft, and pushing said shaft down to connect with the 450 level in the Standard, at which point the Summit ledge has been cut.

Mono.—Crosscutting on the 400 level. The east crosscut is in 18 ft, and the west 12 ft. The ground in face of east crosscut is broken. Work has been resumed on the 260 level, and a crosscut east has been run 180 ft. The flow of water remains unchanged, about 40,000 gallons being hoisted every 24 hours.

MONTEREY.

Carmelo Coal Mine.—Castroville *Argus*, Mar. 14: There is great activity at the mine itself and in the construction of the railroad between the mine and Strader's landing. About 25 Chinamen are employed in grading the road and probably 50 white men in the mine, at the saw-mill and in building trestle work for the railroad. A store has been opened at the landing with the view of supplying the wants of the people at and near the mine, and of all the settlers in that region as well. The mine is considered a very valuable property, the coal being of good, marketable quality and found in quantity sufficient to fully justify the extensive outlay involved in the construction of the four-mile railway, erection of the saw-mill, etc. The railroad will be completed this spring, so that it will not be long before frequent and regular shipments of coal will be made from Strader's landing.

NEVADA.

Notes.—*Foothill Tidings*, Mar. 15: The depth of the Watt shaft is 417 ft. A tunnel has been run east a distance of 1,315 ft, and a western drift commenced which has progressed 50 ft; from the eastern drift are winzes Nos. 1, 2 and 3 at various points. The Scadden Flat works have had all they could conveniently do in pumping, and hoisting was for a time suspended. The contractors on the new shaft of the Washington mine are making rapid progress; 2,120 shares more of the working stock have been offered for sale at 25 cents per share, payable in four installments. At King's hill the incline shaft is sunk 250 ft, and a drift run south 105 ft. The ledge is from 8 to 18 inches in thickness, and gives good paying quartz. The last crushing of rock was 35 loads, which yielded $65 per load without including sulphurets. There are now about 30 loads on the dump. The ledge in Rocky Bar is 4 to 10 inches, and uniformly good. Several companies of tributers, in all 15 to 20 men, are working through the south shaft. Three different lots of tribute rock recently crushed, paying respectively $58.50, $34, and $22 per load. In addition to the tributers, the company has 30 underground men employed. Chief of the Hill, south end of Osborn hill; the shaft and incline down 91 ft; the bottom in hard blasting ground, with a handsome ledge of from 8 to 10 inches in width. Copper ore is now being extracted from the 150 level of the big copper mine at Spenceville, and appears to be inexhaustible in quantity, as no walls to the vein have yet been discovered. In the Pittsburg the 600 north drift has been run a distance of 10 ft. The lode in the latter drift presents well, and is yielding good ore. The 800 north drift has been run six ft during the past week; this drift is also yielding good ore. All the stopes are producing well. The mill is running up to its capacity on company ore.

PLACER.

Mining Items.—Cor. *Democrat*, Mar. 15: Work is still being carried on at the German mine, with even better success than expected. Capt. Staples has a force of men on the North Springfield lead, known as the Old Miner. A clean-up was made at the Tingman last week, which amounted to something less than $2,000. On Big Canyon there is quite a force of men at work on the Lucky Baldwin mine. It is paying a good percentage over expenses. The Pocahontas, at Logtown, has not been doing much of late, but they have concluded to begin sinking in the shaft again. The sinking is to be sub-let to contractors. The big spur wheel at the South Shaft hoisting works of the Springfield was broken by the pump on the lower level, and on account of the delay occasioned, so much ore has not been hoisted as common, as an extra water bucket was put on in place of the ore bucket, but the pump is in running order again, and no more trouble is anticipated.

SIERRA.

Forest City Notes.—Cor. *Messenger*, Mar. 15: The air shaft of the North Fork company has caved in for over 50 ft, and until it is repaired all labor must necessarily be suspended in the tunnels and breasts, which is rather unfortunate at the present encouraging stage of affairs. On March 11th the Bald Mountain Extension tunnel, Watson Bayles, contractor, was in 400 ft, who is now blasting talcose slate or serpentine rock with from three to four pounds of Giant powder per day. Average speed at present, five ft with two shifts of two men each. Good air is brought into the tunnel with a water blast through an iron pipe, which will soon be connected with air boxes further underground. Thickest stratum of rock, 12 ft; in all as run only 50 ft has been pierced.

TRINITY.

Bullychoop & Occidental Co.—*Journal*, Mar. 15: At a meeting of the above company, held in Weaverville, 21 of the 28 shares in the mines were represented. From report it appears that the tunnel is now in a distance of 160 ft. A contract was given to John B. Siegfried to drive it 125 ft further at $6 per ft, the company furnishing powder, tools and light. The tunnel is five ft in width and six ft high. It is expected that one or more of the several lodes embraced in the company's location will be struck by the tunnel within the 125 ft additional contracted for. After this is completed, 325 ft more of tunnel will be necessary to reach the Occidental, which is considered the main lode. An assessment of $80 to each 1-28th interest was levied, payable on the first Monday in May. This amount, when collected, will pay all the company's indebtedness to that date and leave a balance in the treasury with which to do more work. It was also decided at the meeting to take active measures to collect whatever assessments are delinquent at the earliest possible date. Since our last report 125 tons of rock have been run through the arastra, from the Bullychoop lode, yielding at the rate of $16 per ton.

NEVADA.

WASHOE DISTRICT.

Gould & Curry.—Gold Hill *News*, Mar. 20: The joint Best & Belcher east drift, 1700 level, is reaching toward the perpendicular of the Osbiston shaft. The retimbering of the shaft was completed to-day. Sinking at the Osbiston shaft has been stopped for the present on account of water. It has attained a depth of 515 ft. Since work was stopped, the water has raised to the 440 level, where it remains stationary. The drain tunnel is in 75 ft and has still 300 ft to run to reach the shaft.

Belcher.—The main incline has reached a depth of 2,650 ft. The south drift, 2560 level, is being extended six ft per day, and has its face now 285 ft from the incline. Work in the south drift, 2360 level, has been resumed, and it is being pushed toward the south line.

Bullion.—Work in the crosscut, 1840 level, has been suspended temporarily to put the pipe for the new compressor into the shaft. Repairs to the shaft have also been discontinued. Foundations for the compressor are being laid.

Overman.—The drift north on the 1600 level shows no change of formation. It is skirting the vein, sometimes cutting into the black dyke and sometimes running entirely out of it. The winze from this level is down 125 ft.

Con. Virginia.—The repairs to the shaft below the 1400 level are progressing well. The main drifts connecting with the C & C shaft on the 1500 and 1600 levels are still being repaired. The joint Best & Belcher crosscut on the 1950 level has been stopped. The joint California winze has been sunk and timbered to the depth of 78 ft. The joint north drift from the west drift, 2150 level, is now in 86 ft. The average yield of ore per day is about 245 tons.

California.—The repairs to the Con. Virginia shaft are being pushed to an early completion. The joint Consolidated winze from the 1950 level is being sunk at the rate of two ft per day in hard blasting rock, and has attained a depth of 78 ft. The joint north drift from the west drift, 2150 level, is averaging four ft per day. Sinking at the C & C shaft is now making three ft per day in hard rock.

Justice.—Crosscuts Nos. 5, 6 and 7, west, on the 1300 level, are still progressing in favorable vein matter. The usual repairs are being made to the incline and drifts. The surface shaft, south, near the Waller Defeat shaft is yielding 20 tons of very fair ore per day. A small donkey engine is to be placed there which will do away with the windlass and extract the ore at a cost of $1.50 per ton.

Ophir.—The main shaft is receiving needed attention above the 1405 level. The joint Mexican upraise from the 2100 level to connect with the 2000 north drift is still passing through hard blasting porphyry, and averaging three ft per day. The incline is now 130 ft, on the slope, below the 2200 level. The stopes on the 1900 and 2000 levels continue their average yield of high-grade ore.

Sierra Nevada.—By the connections in the drifts on the 2200 level, connecting the incline and the east shaft, and between the 1700 level and the North Con. Virginia shaft, the ventilation of the whole mine is much improved. The incline is in cap rock still showing lively veins of quartz which yield low assays.

Julia Con.—The 2000 level has not yet been freed from water. The pumps are running regularly, raising water to the surface. The pipe connecting with the Sutro tunnel is not large enough for required use. Operations have been resumed in the winze from the 1800 level, and are making better headway than usual.

Leviathan.—The face of the south lateral drift on the 750 level has run into favorable ground, consisting of quartz with streaks and spots of low grade ore. Good stringers of ore continue to cross the north lateral drift on the same level.

North Bonanza and Flowery.—Lateral drifts have been started on the 300 level north in North Bonanza ground and south into Flowery. These are making excellent headway and skirting the ore vein. No change has been encountered in the north drift from the 200 station.

Utah.—Sinking the incline is making good progress The two water tanks in the incline have been completed ready for use. The compressor has been overhauled, and all the machinery is in good condition.

Solid Silver.—The main tunnel has passed entirely through the caved ground at the north end. It is well secured, substantially timbered, and sufficiently widened to admit of a side-track for ore extraction when required.

Sutro Tunnel.—The compromise with the mines has been effected. A very large force of men—reported to be 1,200, in three shifts of 400 each—will be now immediately put to work on the sub-drain.

Hale & Norcross.—The winze from the 2000 east drift has reached the Savage 2100 level. The pumps are holding the water below the 2000 level, and running steadily.

Mexican.—The joint Union Con. winze, from the 1600 level, is averaging two ft per day in hard birdseye porphyry. It is being sunk on the slope; it is in 290 ft on the incline. The main north drift on the 2000 level is approaching the Union Con. line at the rate of six ft per day, in a fine soft vein formation showing considerable quartz. The joint upraise from the north drift 2100 to reach the 2000 level is averaging three ft per day in hard, blasting porphyry.

Union Con.—The flow of water from the 1600 level east drift has decreased to two miners' inches. The joint Mexican winze, 1000 level, is increasing its depth two ft daily, and is down 290 ft on the incline. The Mexican north drift on the 2000 level, is making six ft per day through soft vein matter, showing some fine quartz.

Chollar-Combination Shaft.—The air compressor will be in position soon. The pumps are discharging about 100,000 gallons of water daily into the Sutro Tunnel.

Yellow Jacket.—The eight-inch pipe for the compressor is in place. At the the old shaft the work of taking out the pump column is still going on.

Lady Bryan.—Work on the 380 level and north on the 000 level has been stopped for the present. The south drift on the 600 level is progressing as usual in fine-looking quartz.

Alta.—The north drift on the 1550 level, continued as usual along the vein. The joint Benton double winze is 150 ft below the 1550 level on the slope.

Silver Hill.—The main incline continued on down as usual. The crosscut east from the 1100 level is making five ft per day in a soft formation of clay, quartz and porphyry. There has been a slight increase of water of late, but not enough to interfere with work.

Best & Belcher.—Joint Gould & Curry crosscut No. 1, 1900 level, is cutting hard porphyry and is in 83 ft. West joint Consolidated crosscut No. 3, 1900 level, is in 104 ft, and has been stopped as useless for fear of tapping water.

BELMONT DISTRICT.

Belmont.—*Courier*, Mar. 15: All work at the mine has progressed satisfactorily with good results during the week; have advanced the south raise 20 ft in ore assaying from $100 to $300 per ton, which is the best evidence that can be had of a good body of ore in this part of the mine. Will have about 25 ft more to run to make a connection. The vein matter in 300 level drift is soft which will enable the workmen to get along faster. The stopes are without change, and are yielding the usual amount of rich ore. Number of tons extracted for the week, 17; average assay, $113.

Highbridge.—Have advanced the lower north drift 36 ft; the face looks very favorable for ore. As work advances south toward the Belmont, indications are that there will be a larger body of ore in this part of the mine than was anticipated. The stopes in the upper workings continue looking well and furnish the usual quantity of ore. At present there is in the dumps and ore houses 500 tons of ore ready for the mill. Everything in connection with the mill running as well as usual.

Gila.—The crosscut from 200 level has been driven 19 ft, and the crosscut from winze, 23 ft, making the length of the former 391 ft, and the latter 64 ft. No ore of any value has yet been found in either of these openings, but the indications in both are good for soon striking a body of ore. The stope in the south drift has improved very much. It has increased in length from 45 ft of the distance exposed in the south drift when running it to 75 ft, and no doubt will be as long again and very probably longer. The average width of the vein for the entire length of the stope is about three ft, part of which, a streak on the footwall of about 12 inches, is very rich, assaying from $300 to $700 per ton. The entire vein will average fully $100 per ton.

DANVILLE DISTRICT.

Notes.—*Courier*, Mar. 15: Good progress is being made in developing the Boston and Richmond mines. The veins are very much broken and carry free milling ore of a high grade. In the Sagehen and Trippell mines the prospects of striking good ore are very flattering. Very little work has as yet been done on the locations south of the canyon, but the indications are favorable for finding a paying ledge. The Danville company and St. Louis company are now trying to perfect the necessary arrangements for running a joint tunnel 1,200 ft or 1,300 ft in Mineral hill, at which distance they expect to tap the main ledge at a depth of 450 ft below the surface.

EUREKA DISTRICT.

The Richmond.—*Sentinel*, Mar. 15: The recent development in the Richmond hardly deserves to be characterized as a new find. It is more in the nature of an extension of an ore body hitherto known to exist. It occurs between the fourth and fifth levels, and seems to extend toward the surface. The development is important in this, that it was not altogether expected that ore in quantity would be met with in this particular quarter. The whole mine is looking quite as well as at any time in the past.

The Hamburg.—The intermediate drift has advanced 22 ft, and is now within 23 ft of the upraise from the end of the south drift of the 450 level. The vein of ore followed shows some little improvement. The east crosscut of the 459 level has been continued 13 ft, making a total of 30 ft. The face is in vein matter, with bunches of low grade ore. In the 600 level the west crosscut has been advanced 10 ft, making a total of 179 ft from the main south drift. There is no material change to note. The south drift has been advanced nine ft, making a total from the west crosscut of 116 ft, with the face in unusually hard rock. The winze was sunk 17 ft, making a depth of 80 ft below the 600 level. The bottom is in very favorable vein matter.

The Jackson.—The following work has been done: Main south drift (crosscut) has been run 11 ft; total, 36 ft. Southeast drift has been advanced 11 ft, making 90 ft from the ore chute. Fourth level drift has been run 25 ft; total, 31 ft. The ore chamber continues to look well, especially the east drift, which is now in 60 ft. Intermediate drift, 30 ft below the ore chamber, also shows good ore. Will probably make connection with the ore chamber during the week and afford better ventilation. Everything in and about the mine is running smoothly.

[Continued on Page 188.]

The Mining Debris Question.

Full Text of Judge Keyser's Decision.

In the District Court of the 10th Judicial District, of the county of Sutter.

James H. Keyes plaintiff, vs. Little York Gold-Washing and Water Company (limited) et al., defendant.

Findings of fact and conclusion of law:

The above cause came on regularly for trial at the June term, 1878, of this court. The plaiutiff appeared by George Cadwalader, P. Van Clief and J. H. Craddock as his attorneys, and the defendants appeared by S. M. Wilson, W. C. Belcher, A. B. Dibble and James R. Byrne as their attorneys.

And on the 26th day of July, 1878, the court proceeded to hear the testimony offered on behalf of the plaintiff and defendants, the hearing of which occupied until and including the 9th day of August, 1878.

On the 17th day of February, 1879, the cause was argued by the respective attorneys and submitted to the court for decision, and now the court having duly considered the said above evidence and the arguments of counsel and deliberated thereupon, now files its findings of fact and conclusions of law as follows:

Findings of Fact.

I. The plaintiff is the owuer and in the possession of 1,069 acres of land situated in Sutter county, State of California, in township B (13) north, range 14 east, Mount Diablo base and meridian, lying upon and along the southerly bank of Bear river and about 10 miles below where that river leaves its canyon and enters the valley and about the same distance from the mouth of said river.

The whole of said land originally belonged to the United States, and the United States title in the different parcels became vested in the plaintiff at various times, as follows: June 13th, 1866, being lots 1 and 3 of section (11) 11; June 15th, 1866, being the northwest quarter of section 13, the S. E. one-fourth of the S. E. one-fourth of section 11, and south half of the southwest quarter, and the northeast quarter of the southwest quarter of section 12, and the uortheast quarter and southeast quarter ot section 14.

On the 10th day of September, 1866, the S. W. quarter of section 13; June 1st, 1872, lots 3, 4 and 5, of section 12; June 1st, 1874, the west half of the west half of section 14.

December 11, 1875, those parcels aggregated 1,069 acres. The title to the following parcels of the foregoing lands was conveyed by the United States to the grantors of the plaintiff at the following periods of time, viz.: April 30, 1862, the NE. ¼ of the SW. ¼, and the S. ½ of SW. ¼ of section 12; the E. ½ of section 14; the SE. ¼ of the SW. ¼ of section 11; containing 479 55-100 acres. January 4, 1866, the NW. ¼ of section 13, containing 160 acres. June 1, 1872, the SW. ¼ of section 12, containing 69 39-100 acres. September 6, 1872, the W. ½ of W. ½ of section 14, containing 154 26-100 acres.

Upon these lands between 1862 and 1871 the plaintiff placed lasting and valuable improvements, costing more than $10,000, and consisting of a large dwelling house, two barns, outhouses, orchard and a number of miles of fence, and *the like*, all of which improvements were on said land of the plaintiff at the time of its overflow with mining debris or tailings in the year 1875 and 1876, hereinafter described.

The said lands of plaintiff in their original condition were highly productive alluvial lands, adapted to the raising of wheat, corn and all the valuable agricultural products of the State.

That on the 15th day of January, 1875, 400 acres of plaintiff's lands were overflowed with the tailings or debris from the defendants' mines to a depth varying from three inches to three feet, and in March, 1876, from the same cause substantially, the same part of plaintiff's lands was again covered with another deposit of mining debris from defendants' mines.

The lands so overflowed are bounded by a line commencing at the center of section 13, and thence running north to the northeast corner of the NW. ¼ of the section; thence running nearly northwest across the SE. ¼ of the SW. ¼ of section 12, and continuing on a westerly course to old Bear river, and following it to the north line of section 14, at the center thereof; thence south on the center line of section 14 to the south line thereof; thence east to southeast corner of section 14; and thence to the center of section 13 to the point of beginning.

The dwelling house, outhouses and barns of the plaintiff were situated on the NW. ¼ of section 13, and also part of plaintiff's orchard.

The mining debris referred to consists of fine and coarse sand, small stone and sticky compound, composed of clay and sand, called slickens.

The effect of such overflows and deposits were to render the land overflowed and unproductive and incapable of any kind of cultivation during the year of the overflow and the year succeeding, and to permanently injure and largely impair the value of the land so overflowed, and to largely reduce its producing capacity, and to make it necessary for plaintiff to raise his dwelling house and outhouses and barns, which were situated on said overflowed lands, so as to make them habitable and fit for use, to likewise raise his fences and to expend large sums of money in repairing old and constructing new levees in and about which and for the productiou of his said lands, he has expended over $20,000.

That the deposits of the mining debris on plaintiff's land in 1875 and 1876 were an obstruction to the free use of that property and interfered with its use and enjoyments and very largely impaired its value iu the market as well its producing capacity.

That these deposits of mining debris upon plaintiff's land in January, 1875, and March, 1876, were part of the mining tailings deposited by the defendants in Bear river and its tributaries, and which by the waters of that stream and the water used by the defendants in their mining operations had been swept down Bear river upon the lands of the plaintiff.

That a continuance by defendants of their manner of using the bed of Bear river and its tributaries as a place for the deposit of their mining tailings will prevent the cultivation and utterly destroy all of plaintiff's land and render it unfit for agricultural uses or as a place of habitation.

That the defendants during the time they work their mines render the water of Bear river, opposite plaintiff's land, totally unfit for domestic or animal use or for the purpose of irrigation.

II. The defendants are the owuers of mining claims, which, three years before the commencement of this suit, and ever since they have worked by what is called the hydraulic process of mining.

These mining claims are situated at an elevation of 3,000 feet or thereabouts, above the level of the sea; about 60 miles from plaintiff's lands, and upon the hilltops adjacent to Bear river and its tributaries, and all lie within a radius of seven miles. These mining claims in the aggregate, include several thousand acres; one above containing 1,110 acres; the average depth to which these claims mined exceeds 50 feet; the upper part of these claims consists of free surface earth, the greater part of which was washed away into Bear river prior to 1862.

This earth is but slightly charged with gold, and does not pay for washing; below it is the channel of an old and extinct river—having a course at nearly right angles with the present rivers on the western slope of the Sierra Nevada.

Among the earth, stones and gravel, of this old river bed is found gold in greater quantities than in the superincumbent earth.

The mining claims of defendants are worked by means of immense blasts of powder to loosen or shatter the earthy matter, enormous heads of water to sweep the loosened matter into ditches, flumes and tail races set a heavy grade through which, at a great velocity, the earth, stones and water rush—the gold therein being separated from the earth by the action of the water and caught by means of pavements of stones and blocks of wood, set in the bottom of the ditches, flumes, tail races aforesaid, and the refuse matter known as tailings, and consisting of muddy water, sand, clay, coarse gravel, rounded quartz, pebbls and cobble stones, are deposited at the dump of these mining claims which are either in ths bed of Bear river or its tributaries, or in the beds of the steep ravines and gulches immediately contiguous to and leading into the bed of Bear river or its tributaries.

Unequal deposits are made from the several mining claims of defendants, depending upon the quantity and pressure of the water used by them, and the hardness or softness of the material at the time being worked.

These claims are worked from five to six months in the year; starting up about the 1st of January and continuing as long as the water lasts.

The deposits of the tailings from the mining claims of the defendants and at their dumps during the three years next preceding the commencement of this suit, was nearly 20,000,000 of cubic yards of tailings, and the annual deposit has been in that ratio, and is rapidly and annually increasing.

The mining claims of defendants are now only worked out to one-quarter their extent.

The number of men who receive employment from the mining claims of defendants is between 400 and 500.

The mines of defendants are the only ones shown by the testimony to have been in operation at the head of Bear river at the commencement of this suit, or during the three years before the commencement of this suit.

Bear river is a living stream, heading in or near the summit of the Sierra Nevada mountains, and pursues through deep defiles a westerly course until it touches the eastern margin of the Sacramento valley at a place called, "Camp Far West," where it debouches into that valley and crosses it on really the same course in a valley of its own, and empties into Feather river, at the town of Nicolaus, in Sutter county.

The altitude of Bear river valley at plaintiff's farm is about 70 (70) feet above the sea level. Its lands were originally agricultural lands of the first class, through which Bear river ran; is a well defined channel between high banks. The water thereof was clear in summer, and sufficiently pure at all seasons of the year for domestic or animal uses, or for purposes of irrigation.

The grade of Bear river and its tributaries from the dumps of defendants' mining claims to where it debouches into the Sacramento river is not less than 50 feet per mile, and where it runs through that valley, less than 10 feet per mile. The tailings deposited from the mining claims of defendants with the exceptions of the heaviest cobble, sand and other heavier stones, are swept by the force of the water in Bear river and its tributaries, and the water used by defendants in their mining operations down into Bear river proper, whence they become intermixed and by the same forces are swept down and through the defiles or canyons of Bear river, except the cobbles and other heavier stones, to the place whers said river debouches into the Sacramento valley.

That from the mouth of the canyon to the mouth of Bear river the grade of this stream is much reduced; that a large part of the slickings, sand and small stones from the defendants mines instead of passing through the channel of that river into Feather river, choked and filled its channel and overflowed its banks and adjacent lands with mining debris and caused it to form new channels in the valley which in time were closed and filled up with mining debris and new channels were thereupon formed at random in the valley, and from such causes a number of thousands of acres of rich and valuable agricultural land in Bear river valley have been covered to a depth varying from 18 inches to 15 feet with this mining debris consisting of sand, stone and slickings to the substantial ruin of such land

The water when first used by defendants mines is clear, but in being used for hydraulic mining, gains in solution, about five per cent. of its volume in earthy matter, and carries that percentage currently with the current down Bear river as far as plaintiff's lands. Water taken from Bear river opposite plaintiff's lands in January, 1875, contained nearly 30% of earthy matter. The travel of the heavier sand not held in solution by water, is about eight miles per day, while cobble stones from defendants' mines are forced by the water down Bear river, but at a slow rate. That since 1873 there has been a sensible and steady increase in the quantity of mining debris or tailings coming down Bear river into the valley from the mines of defendants, and this increase will steadily continue for years to come.

The deposits of mining debris at the head of the river have increased the grade, the bed of the stream, and smothered its bottom, and a smaller quantity of water brings down a greater amount of mining tailings than before such changes in bed of the stream occurred, that at least 40,000 acres of valuable and productive agricultural land in the valley of Bear river and the Sacramento proper eventually will be covered to the depth of several feet with mining tailings from the mines of defendants, and be rendered unproductive and uninhabitable if defendants continue to use the head of Bear river and its tributaries as a place of deposit for their mining tailings.

That within a short time after the hydraulic mines at the head of Bear river stop work, the water of Bear river becomes comparatively clear and fit for use, even after the early freshets of the winter, but before the hydraulic mines resume their operations.

That the mining operations at the head of Bear river before the year 1862 did no damage to the lands in the valley of Bear river, nor did they impair the quality of the water in that river so as to render it unfit for either of the uses known as domestic, animal or irrigating, and that to that time said lands and said water were not impaired or impured.

That the first damage to lands in the valley of Bear river from the mining debris occurred in the year 1862, which was a year noted for its extraordinary freshets.

During this year there was a heavy deposit of mining debris on about 200 acres of plaintiff's land, being the N. ½ of NE. ¼ of SW. ¼ of section 12; also, 20 or 30 acres in the NW. ¼ of SW. ¼ of the same section; lots 3, 4 and 5, being the fractional portions of section 12; also some lands in fractional portions of section 11.

These are different lands from those overflowed with mining debris in January, 1875, and March, 1876. No farther injury of consequence occurred to plaintiff's land from mining debris until January, 1875, and March, 1876.

That the year 1862 was the time of the commencement of hydraulic mining of considerable magnitude at the head of Bear river, and such business at that place has steadily increased in magnitude from that time to this. That there has been a similar increase each year (at the same stage of water) in the flow of tailings down Bear river and into the valley thereof.

That plaintiff never acquiesed in the wrongful acts of defendants and has not yet been guilty of laches of faults in not applying for relief sooner, as he and a large number of persons owning similarly situated land in the valley of Bear river, were endeavoring by constructing levees, new channels, drains, opening sloughs and straightening channels to protect their lands from being overflowed by mining debris, and believed that they could so protect themselves and were expecting a dimunition in the flow of tailings and that they would have succeeded in protecting their lands, but for the increase of the deposit of tailings in the bed of Bear river and its tributaries and the increase in the flow thereof into the valley of Bear river commencing in 1873, and gradually increasing and ending in the overflow of January, 1875, and March, 1876, of plaintiff's land as described in the first article of these findings; that at the commencement of this suit the waters of Bear river opposite plaintiff's land were, and are now, so foul and corrupted by the deposit of mining tailings therein from defendants mines, as to be unfit for use by man or animals or for the purposes of irrigation.

III. That each of the defendants has materially contributed to the injury and damage of plaintiff's land by washing into Bear river and its tributaries the tailings from their several mines, and intend to continue so to do.

That it is and will be impossible for plaintiff to ascertain or prove the proportion in which either or any of the said defendants have contributed to his damage and injury as aforesaid or will hereafter contribute to the damage and injury apprehended by him as aforesaid.

IV. That the defendants styled the Little York Gold Washing and Water Co., (limited) and the Cedar Creek Gold Mines and Water Co., (limited) and the Bird's-Eye Creek Gold, Silver and Copper Mining Co., (limited) are each foreign mining corporations, created under the laws of Great Britain, and that neither of them has at any time filed in the office of the Secretary of State of the State of California any paper designating or purporting to designate in behalf of their respective companies any person or persons whom process issued by authority of or under any law of this State may be served upon such company, or either of them, nor have they, or either of them, in any measure complied with or attempted to comply with any of the requirements of section of the Act entitled: An Act in relation to foreign corporations, approved April 1st, 1872.

V. That about the year of 1852, mining districts were formed which embrace all the mining claims of defendants, and mining laws were adopted, prescribing the size, mode and manner of locating and holding mining claims in such districts, and when such modes and regulations were not regularly adopted those matters were controlled by the customs prevailing in such district or districts. No law, custom or usage regulated or purported to regulate the manner in which mining claims should be worked. Locations of mining claims were made in accordance with the laws thus adopted; water for mining purposes were appropriated; ditches constructed and many operations requiring the use of water were commenced. The operations have been carried on with some intermissions and changes in the mode of working.

Continuously up to the present time since the commencement of gold washing in California to the present time, miners have discharged the tailings coming from mines into the nearest or most convenient ravine or outlets, and such has been the practice in all the mining districts of the State.

That from 1856 up to the present time the defendants and those through they claim, and all others engaged in mining within the water shed of Bear river have openly, continuously and notoriously washed, worked and mined their claims by the use of water as a power, and dumped and discharged the tailings from their mines into said Bear river and its tributaries, streams, canyons and ravines, as was most convenient and practicable.

The mining claims of D. W. Balch, substituted as defendant in the place of the Little York Mining Co. (limited), were located not later than the year 1874.

The defendant Balch has been the owner thereof since March 8th, 1876; his grantor, the Little York Co. (limited), has been the owner since October 3d, 1873; his grantor received a patent from the United States, dated June 10th, 1872.

The dumps or discharge grounds of said mining claims is upon ground embraced within the limits of said patent; Balch paid $100,000 for these claims and their estimated value exceeds that sum. The mining claims of the Cedar Creek Gold Mines and Water Co. (limited), were located between 1852 and 1861.

This company acquired its title to said claims in 1872; United States patent for these claims were issued to it in the years 1873 and 1875. The dumps or discharge of said claims is upon grounds embraced in said patents, said mining claims, including their water rights, cost $475,000, which is their estimated value.

The mining claims of the defendant, the Bird's-Eye Creek Gold Mining Co., were located in the year 1852; its title accrued on the 30th day of March, 1871. Such claims were patented to it by the United States on the 8th day of April, 1874.

The dump or place of discharge of two of its claims is upon ground embraced within the limits of said patent, to wit: The Neece & West, and Wallowps claims.

The claims cost the present owner $380,000. Their greatest value is estimated at $500,000.

The mining claims of the Franklin Mining Co. was located in the year 1874. This defendant has been the owner of such claims since January 21st, 1875; its title comes through a patent from the United States, dated June 22d, 1872.

The mining claims of the Polar Star Hydraulic Gold Mining Co. were located in the years 1852 and 1874. This company has been the owner of said claims since October 13th, 1875. It holds its title to said claims under a patent from the United States, dated June 22d, 1872. The dumps or discharges of said claims is upon ground embraced within the lines of said patent.

The mining claims of the defendants, the Oold Run Ditch and Mining Co., were located prior to the year 1867. This company acquiried its title May 31st, 1872. There has been no work done on the claims of this company known as Pine Tops since March, 1874.

The mining claims of W. and P. Nichols, substituted as defendants in place of John, Charles, and James Staples, was located in the year 1855. Defendants Nichols has been the owner thereof since the 24th of April, 1878. Their grantors were owners from September 21st, 1874. Their patent from the United States is dated July, 1874.

The mining claims of the defendant, J. H. Le Kamp, were located in the year 1856. The defendant, Le Kamp, has been the owner of such claims since July, 1872.

The mining claims of the defendant, B. Huysink, were located prior to the year 1856. The defendant, B. Huysink, has been the owner of such claims since August 19th, 1872. He holds his title thereto by United States patent, dated June 22d, 1872. The dump or discharge of said claims is upon grounds embraced within the limits of said patent.

The mining claims of the defendant, W. H. Raymond, were located prior to the year 1860. The defendant, Raymond, has been the owner of such claims since November 22d, 1873.

The mining claims of the Camden Mining Co., substituted as defendant instead of Edward Carney and P. L. Goodseed, were located prior to the year 1856. The Camden Mining Co. have been the owner of such claims since the year 1856.

The mining claims of the defendants, A. A. Sargent and William Jacobs, the latter substituted instead of George F. Jacobs, were located prior to the year 1857. The defendant, A. A. Sargent, has been the owner of an undivided one-half interest in said claims since 1861. The defendant, William Jacobs, has been the owner of an undivided one-half interest therein since December 1st, 1877; his predecessor in interest, George F. Jacobs, has been the owner of an undivided one-half interest therein since 1857. Said defendants hold their title to said mines under a patent from the United States, dated June 4th, 1872. The dump or discharge of said claims is upon grounds embraced within the limits of said patent. Their estimated value is $250,000.

The defendant, John Hussey, has been the owner of the Hussey claim since October, 1874. Said claim was located in the year 1858. A United States patent was applied for in June, 1878, but such patent has not yet been issued.

The mining claims of defendants, Knight Bros., were located prior to the year 1859. They are worked by what is called the drifting process, which does not disturb what is called the upper strata, but drifts out and washes what is called the pay streak or lower strata. The tailings from these claims are deposited in the bed of a creek which leads into one of the main tributaries of Bear river.

The defendants, the Knight Bros., were located in the year 1859. The defendants, Wyck Bros., have been the owners of these claims since 1858.

These claims are partly worked by the hydraulic process and partly by the drifting process. The tailings from these claims are deposited in one of the tributaries of Bear river.

The mining claims of the defendants, Nutting, Cooper, Frick & Frick, were located prior to the year 1867.

The defendants have been the owners of these claims since the year 1867. In the year 1859 they applied to the United States for a patent and paid therefor, and have a certificate of purchase therefor. These claims are likewise worked by what is called the drifting process. Their tailings are deposited in a ravine which leads into one of the tributaries of Bear river.

The defendants, A. G. Turner, sued as H. E. Turner, never was the owner of or in any way interested in the mining claim called the Gouge Eye. He never worked upon or mined the same or discharged therefrom any tailings into the bed of Bear river or its tributaries.

The defendants, the Elmore Hill Hydraulic Mining Co., and the Chalk Mountain Blue Gravel Mining Co., although duly served with summons complaint herein, did not answer or defend their suit.

Hydraulic mining, in the sense by which that term is now generally understood, was introduced in the mining districts at the head of Bear river in a limited way as early as 1852.

The defendants, except those engaged in drift mining, have, in conducting the mining operations, followed what is called hydraulic mining, in the manner in which the same is described in the findings; and this method of mining is the most economical as well as the most effective method known of separating such gold in such mining claims, from the earth, stone, and gravel which contain it.

The dumps or places of discharge of the various mines of the defendants are not contiguous nor in close proximity to each other, with a few exceptions, but in all cases the tailings from the various mines commingle and run together in Bear river before they reach the land of the plaintiff. Said dumps are in many instances several miles apart from each other.

The gold contained in the gravel deposits on the Blue Lead, upon which the claims of defendants are situated, varies from $50,000 to $300,000 per acre, as estimated or conjectured.

The cessation of hydraulic mining would greatly reduce the taxable property of all the mining counties of the State.

VII. The cause of action of plaintiff and his right to the relief demanded by him is not barred by any or either of the statutes of limitations set up by either of the defendants in their answers herein.

Conclusions of Law.

1. That the plaintiff's cause of action and his right to the relief herein demanded is not barred by all or either of the statutes of limitation pleaded by the defendants in this case or otherwise.

2. The defendants or either of them have not acquired any right to use the bed of Bear river nor the beds of its tributaries as a place of deposit of their mining tailings, nor to choke and fill with such tailings the channels of Bear river in the valley thereof, nor to flow or overflow plaintiff's lands with such tailings, nor to corrupt, foul and make unfit for domestic, animal or irrigating uses, the water of Bear river.

3. The acts of defendants and each of them constitute a nuisance and are an obstruction to the free use by plaintiff of said lands and an interference with the comfortable enjoyments of said property by him.

4. The mining laws and mining customs of the several mining districts mentioned and referred to in the findings of fact herein were not intended to and did not and cannot protect the defendants in the doing of the acts, matters and things complained of in this action.

5. The plaintiff is entitled to the relief by him demanded. Let judgment be entered accordingly.

PHIL. W. KEYSER, District Judge.

Decree.

James H. Keyes vs. Little York Gold and Water Co. (limited), et al.

In the foregoing cause the defendant having duly appeared, and the case having been duly tried and argued, the Court, after due consideration thereof, doth order, adjudge and decree as follows, to wit: That D. W. Balch, substituted as a defendant herein instead of the Little York Gold Washing and Water Co. (limited); the Cedar Creek Gold Mines and Water Co (limited); the Bird's-Eye Creek Gold Mining Co. (limited); Franklin Gravel Mining Co.; Polar Star Hydraulic Gold Mining Co.; Elmore Hill Hydraulic Mining Co.; Chalk Mountain Blue Gravel Co.; Gold Run Ditch and Mining Co., substituted as a defendant instead of the Miners' Ditch Co.; W. and P. Nichols, substituted as defendants instead of John, Charles, and James Staples; also J. H. Le Kamp and B. Huysink, W. H. Raymond and John Hussey; Camden Mining Co., substituted as a defendant herein instead of Edward Carney and P. L. Goodspeed; L. W. Preble. A. A. Sargent, and William Jacobs, co-partners under the name of Sargent & Jacobs, the latter substituted as defendant instead of George F. Jacobs; also H. Knight and William Knight, co-partners under the name of Knight Bros.; Conrad Wyck and P. Wyck, A. N. Nutting, Alonzo Cooper, J. B. Frick, and O. A. Frick, substituted for defendants impleaded as Nutting, Cooper, Frick and Frick; and the Superintendents, agents, officers, servants and employees of the foregoing defendants, and each of them be, and they are each of them hereby perpetually enjoined and restrained from using the bed of Bear river, or the beds of any or either of its tributaries, ravines or gulches, as a place of deposit, or as a dump or place of discharge for the tailings or debris of their said mines or mining claims or either of them, and especially from using said beds of said stream or either of them as a place of deposit of the tailings from those mining claims known as the Empire, Christmas Hill, Council Hill, Liberty Hill, Yankee Badger, Jehosaphat, Central Red Dog, Wallapa, Neece & West, Franklin, Polar Star, Buckeye, American, Elmore Hill, Chalk Bluff, Pine Tops, Somerset, Le Kamp, North Star, Sailor, Boston, Doolittle, Hussey, Gouge Eye, Quaker Hill, Rhode Island, Remington Hill, Wyck Bros'. claim, Lowell Hill, Swamp Angel, Pleasant or Mount Pleasant, and especially from continuing to use their present dumps as a place for the discharge and deposit of the tailings or debris from said mines; and they and each of said defendants are further hereby perpetually restrained and prohibited from fouling and corrupting the water of Bear river, and its branches, tributaries, streams, ravines and gulches, with tailings or debris from their said mines, or either of them; that the plaintiff herein recover his costs of this suit taxed at $—— against the foregoing named defendants, except the Oold Run Ditch and Mining Co.; that the defendant, A. G. Turner, having disclaimed the complaint of plaintiff as to him, is hereby dismissed, but without cost to either party.

Done at Chambers, this 10th day of March, A. D., 1879.

PHIL. W. KEYSER, District Judge.

INDIAN LANDS.—Of the forty-one million acres of land in the Indian Territory, twenty-six millions have been set apart for savages and the remaining fifteen millions are unsurveyed and belong to the United States. The Indians who have thus far gone there have done practically nothing in the way of developing the immense resources there to be found. If the land was equally divided up among these Indian emigrants, it would average over 500 acres to each, which in the hands of industrious white settlers might have been made to confer immense benefits upon the country in the way of opening up one of the richest and most magnificent districts to be found between the Atlantic and Pacific. The soil, climate, water facilities and all other natural characteristics are the best and most desirable to be found anywhere in the country. No civilized government has ever been organized there—the Indians having it all to themselves and doing nothing with it.—*Arizona Enterprise.*

HAYSTACK FIRES—WASP INCENDIARIES.—The frequent mysterious burning of haystacks and farmers' buildings has led to the discovery that they are usually set on fire by wasps' nests, and that the nests are ignited by spontaneous combustion. This is produced by the chemical action of the wax in contact with the paper-like substance of which the nest is composed, a comparatively small access of oxygen being sufficient to make it burst forth in a blaze.

An Eastern View of Pacific Coast Timber Preservation.

Prof. C. S. Sargent, Director of the Botanic Garden of Harvard University, writes an article on forestry for the *Nation*, in the course of which he presents his views on the destruction of timber on this coast and the means of restoring depleted forests. He thinks at the East the restoration may be left to individual and corporate intelligence and enterprises, and then continues as follows:

West of the Rocky mountains all is different. The country is cut up by high mountain chains overlooking narrow valleys. The rainfall is in parts of this region exceedingly small, and everywhere very unequally distributed throughout the year; so that once destroyed it would be difficult or, indeed, impossible to restore any forests of this region beyond the immediate influence of the Pacific ocean; while its peculiar topography demands that the mountain ranges remain forest-covered that the valleys may be habitable. Large portions of this Western territory are still in the hands of the general Government, and before it is too late, steps should be taken to set aside and scrupulously preserve at least such portions of forest-covered mountain ranges as give rise to important streams. It is probably already too late to preserve any considerable part of the scanty forests of the "Great basin." They are everywhere fast melting away to supply the enormous and often unnecessary demands of the mining enterprises of that region. These forests, which are of immense age, once destroyed, will never reappear, and the streams which now make agriculture possible in the valleys through irrigation will, at no distant day, flow only during a short period of the year. If any portion of this interior region is worth saving for agriculture, immediate steps must be taken to preserve the remnants of its forests, or it will not long support even its present small agricultural population.

More important still is the necessity for Government or State preservation of some part of the noble coniferous forest which graces the western slopes of the Sierra Nevada. The future of California depends on the existence of this forest. Nowhere on the face of the globe is the physical necessity for preserving the forests greater than in California; nowhere has the world seen its forests so rapidly and senselessly destroyed. We will briefly examine what the dangers are which threaten California, and what should be undertaken to prevent or at least diminish them. All along the western slope of the Sierras numerous rivers head, which, flowing westward through the rich foothills and great plains of California, fall into the Sacramento and the San Joaquin, the one flowing south and the other north, and at length emptying into the bay of San Francisco. Through these rivers must pass all the moisture, not absorbed by the soil, which the Sierras attract from the ocean lying almost at their feet. The annual precipitation of moisture in these mountains, although almost exclusively confined to the winter months, is still very large, a fall of 60 feet of snow during an exceptionally severe winter having been reported in the high Sierras. It results that in the early summer months, when the snow is melting, these mountain streams become large and rapid rivers, carrying off immense volumes of water, and then almost entirely disappearing with the snow. As they are not replenished by summer rains, the length of their annual duration must depend on the slowness with which the snow at their sources melts. It is a well-known fact that snow melts much less rapidly, and that much more of it is absorbed in the forest than in the open ground; while the forests on a mountain side offers great mechanical resistance, especially by their undergrowth and coating of fallen leaves, to the rapid running off of water or melting snow. If the forests of the Sierras are destroyed, their annual snowfall will probably not be materially diminished. The length of time, however, required to melt it will be much shorter; and the absorbing power of the forest being gone, the volume of water passing through the rivers will be greatly increased. It is not difficult to foretell the results. Every season, earlier at the south, later at the north, torrents, more terrible and more destructive than the history of the world records, will carry during a few weeks death and desolation from the mountain-sides down over the footbills, covering the plains with debris and holding the cities lying along the low banks of the larger rivers at their mercy. And then, when this terrible rush of a few days is over, it will be found that the whole supply of water for the summer is exhausted. The foothills and the plain will no longer produce fruits or vegetables, or any summer crop for which irrigation is essential, for no water to irrigate with will come down from the mountains. "Placer mining" will be a thing of the past, and even the navigation of the great rivers will be either interrupted or abandoned. During the last 50 years more than one country in Europe has been visited by calamities similar in origin and extent to those which now threaten California, but in none of them were the physical reasons for the danger so great. The mountains from which the destructive torrents of Europe have sprung are lower than the Sierras, less heavily forest-clad, and enjoying a more regular precipitation of moisture with a much smaller snowfall, and so less able to produce sudden and disastrous torrents.

There is but one remedy for the dangers we foretell, and on its adoption depends the future of California. A strip or strips of forest must be set aside along the western slope of the Sierras extensive enough to secure the natural flow of rivers, and these reservations must be strictly guarded from fire, the axe, and especially from all browsing animals. It is in her boasted millions of sheep that California's greatest danger now lies. These, with countless herds of other browsing animals, are driven up every summer from the plains into the mountains to feed during the dry season. The damage they are inflicting in the Sierra forests is terrible and indescribable. One can ride for days at a certain elevation through the mountains along the sheep-trails without seeing outside of the rare ranch enclosures a single uninjured shrub or a seedling tree of any sort. Everything the sheep can reach is eaten clean. This means that there is nothing left of the forest but its older trees, and that it has lost or is fast losing its best element for holding back melted snow; and it means, too, that there are no new trees coming on to take the place in their turn of their parents. As the number of animals driven to the mountains increases, forest fires increase also, set by the shepherds either accidentally or purposely to increase the next year's feed. A forest annually wasted by fire, on which the axe is always making terrible inroads, and in which no young trees are allowed to spring up, is clearly doomed. When that of the Sierras, the noblest of our continent, has gone, nothing will stand between California and the dangers which threaten her. To preserve California is the first and greatest duty of American forestry. The task is a difficult one, but it can be accomplished if her people desire it.

Useful Information.

Facts of Value to the Housewife.

That salt will curdle new milk; hence, in preparing milk-porridge, gravies, etc., the salt should not be added until the dish is prepared.

That fresh meat, after beginning to sour, will sweeten if placed out of doors in the cool air overnight.

That clear, boiling water will remove tea stains and many fruit stains. Pour the water through the stain, and thus prevent it from spreading over the fabric.

That ripe tomatoes will remove ink and other stains from white cloth, also from the hands.

That a tablespoonful of turpentine boiled with your white clothes will greatly aid the whitening process.

That boiled starch is much improved by the addition of a little sperm, or a little salt, or both, or a little gum arabic dissolved.

That beeswax and salt will make your rusty flat-irons as clean and smooth as glass. Tie a lump of wax in a rag, and keep it for the purpose. When the irons are hot, rub them first with the wax rag, then scour with a paper or cloth sprinkled with salt.

That blue ointment and kerosene mixed in equal proportions and applied to bedsteads is an unfailing bedbug remedy, and that a coat of whitewash is ditto for the walls of a log-house.

That kerosene oil will soften boots or shoes which have been hardened by water, and render them as pliable as new.

That kerosene will make your tin kettle as bright as new. Saturate a woolen rag and rub with it. It will also remove stains from, and clean, varnished furniture.

That cold rain-water and soap will remove machine grease from washable fabrics.

Japanese Magic Mirrors.—The so-called magic mirrors, with which the Japanese metal-workers have hitherto succeeded in puzzling our *savants*, have been generally supposed to owe their strange property of reflecting images that were quite invisible upon their brilliantly polished surfaces, to corresponding inequalities in the density of the surface, produced by some means during cooling or by stamping. Professors Ayrton and Petty, who have lately studied their peculiarities, offer another explanation. They affirm that the effects above noticed are produced by reason of very slight irregularities in curvature of the polished surfaces, these irregularities being such that the thicker parts, corresponding with the raised patterns on the back, are flatter than the remaining convex surface, by which difference there would be less dispersion of light from the thick than from the thin portions of the surface. As, unless we are greatly mistaken, we remember to have seen such mirrors with apparently perfectly plane surfaces, the above explanation would appear to be less satisfactory than the older one.

Case-Hardening Iron.—In order to economize in the more expensive materials for case-hardening cast, wrought or malleable iron, and to harden only portions of the article in different degrees, if required, Mr. Gracie S. Roberts, of Brooklyn, makes use of an improved method. After polishing the surface, he glues to the portions to be case-hardened a coating of yellow prussiate of potash. A number of coats are given, according to the degree of the case-hardening required. A cheaper material or simply boneblack is used where a slight effect only is required. When the glue is set hard, the article is packed in powdered charcoal, heated to redness in a quick fire and maintained at that heat for half an hour. Then it is hardened and tempered in the usual manner.

Coating Metals With Tin.—The process of coating metals with tin promises to extend its use for culinary and other uses. Its electro-deposition is proposed by means of a zinc and carbon battery. The inner cell containing the zinc is filled with dilute sulphuric acid. The articles to be coated with tin are put into a bath composed of 8 parts of protochloride of tin, 16 of cream of tartar, and 2 of the chloride if the latter is used. When it is present the tin coating is effected more rapidly, whereas, when the bath is composed of protochloride of tin and cream of tartar only, the tin coating is very white, but is not produced so rapidly as when the chloride is used. These ingredients should be dissolved in about 100 gallons of distilled water. The black plates are first "pickled" in any suitable manner, and then immersed in the above described bath or solution, and are allowed to remain in the same for a longer or shorter time, according to the thickness of the deposit or coating of tin required on the plates. While in this bath the plates or other pieces to be coated are connected by a wire with the positive end of the battery, while the negative end of the battery is connected with a piece of tin hung in the same bath. When the plates or other pieces or articles have been sufficiently coated with tin, they are held over a fire in order to give the tin a lustrous appearance.

Triumph of Electrical Science.—In the cable news of a few days since, it was stated that the French Atlantic cable was "broken 161 miles from St. Pierre Miquelou, in 500 fathoms of water." These few words show one of the many triumphs of modern electrical science. Here is a wire cord buried under three-fifths of a mile of the water of the ocean, and 160 miles from land—and yet the people on shore can exactly locate the points at which it is broken. Strange as that seems, it is actually done, and has been time and again. The repairing vessels will go out to the indicated point, throw over their grappling hooks, and within a few hundred yards will find the broken ends and splice them. This wonder is accomplished, first, by exact knowledge of the laws of electricity, which make known what amount of currents a wire of a given dimension will carry, and the resistance it must overcome in going to a given distance, and, next, by the instruments made by the mechanicians of our day, which will make the operation of both laws visible to the experienced observer, even if the break in the cable is a thousand miles away and two miles under the sea.—*Philadelphia Ledger.*

To Make Iron Take a Bright Polish like Steel.—Pulverize and dissolve the following articles in one quart of hot water: Blue vitriol, one ounce; borax, one ounce; prussiate of potash, one ounce; charcoal, one ounce; salt, one half-pint; then add one gallon linseed oil. Mix well, bring your iron or steel to the proper heat and cool in the solution. It is said the manufacturers of the Judson governor paid $100 for this recipe, the object being to case-harden iron so that it would take a bright polish like steel.

The Locomotive.—The ordinary life of a locomotive engine is stated at 30 years. Some of the small parts require renewal every six months. The boiler tubes last five years, and the crank axles six years; tires, boilers and fire-boxes six to seven years. The side frames, axles and other parts 30 years.

Good Health.

What to Do in Cases of Diphtheria.

[From the Circular of the Massachusetts State Board of Health.]

In the first place, as diphtheria is a contagious disease, and under certain circumstances not entirely known, very highly so, it is important that all practical means should be taken to separate the sick from the well. As it is also infectious, woolen clothes, carpets, curtains, bangings, etc., should be avoided in the sick room, and only such materials used as can be readily washed.

All clothes, when removed from the patient, should be at once placed in hot water. Pocket-handkerchiefs should be laid aside, and in their stead soft pieces of linen or cotton cloth should be used, and at once burned.

Disinfectants should always be placed in the vessel containing the expectoration, and may be used somewhat freely in the sick room; those being especially useful which destroy bad odors without causing others (nitrate of lead, chloride of zinc, etc.) In schools there should be especial supervision, as the disease is often so mild in its early stages as not to attract common attention; and no child should be allowed to attend school from an infected house, until allowed to do so by a competent physician. In the case of young children, all reasonable care should be taken to prevent undue exposure to the cold.

Pure water for drinking should be used, avoiding contaminated sources of supply; ventilation should be insisted on, and local drainage must be carefully attended to. Privies and cesspools, where they exist, should be frequently emptied and disinfected; slop water should not be allowed to soak into the surface of the ground near dwelling-houses, and the cellars should be kept dry and sweet.

In all cases of diphtheria fully as great care should be taken in disinfecting the sick room, after use, as in scarlet fever. After a death from diphtheria, the clothing disused should be burned, or exposed to nearly or quite a heat of boiling water. The body should be placed as early as practicable in the coffin, with disinfectants, and the coffin should be tightly closed. Children, at least, and better adults also in most cases, should not attend a funeral from a house in which a death from diphtheria has occurred. But with suitable precautions, it is not necessary that the funeral should be private, provided the corpse be not in any way exposed.

Although it is not at present possible to remove at once all sources of epidemic disease, yet the frequent visitation of such disease, and especially its continued prevalence, may be taken as sufficient evidence of insanitary surroundings, and of sources of sickness to a certain extent preventable.

It should be distinctly understood that no amount of artificial "disinfection" can ever take the place of pure air, good water and proper drainage, which cannot be gained without prompt and efficient removal of all filth, whether from slaughter houses, etc., public buildings, crowded tenements or private residences.

Temperature of the Head.—Some investigations have recently been made by several physiologists concerning the effect of mental activity upon the temperature of the brain. Several thermometers are placed on different parts of the head and fastened there by means of straps; then the person subjects himself to various intellectual processes, and the result shows a decided increase of temperature in certain parts of the brain. The temperature of the brain of a professor was elevated several degrees while delivering a lecture. Even the slightest intellectual effort raises the temperature of the head above that which it reaches in idle conversation. It is interesting to note that certain parts of the brain show a greater increase of temperature than others. Where the temperature of the head is increased beyond a certain point, intellectual effort takes place with difficulty, or with pain. This is very apt to be the case with persons of a very nervous temperament. It would therefore be prudent for such to cease intellectual effort, before the temperature is reached, and devote themselves to some physical exercise which shall equalize the circulation and restore the normal temperature to the extremities.

Morning Walks not Healthful.—It is a great mistake, says a medical writer, to suppose that a morning walk or other form of exercise before breakfast is healthful; the malaria which rests on the earth about sunrise in summer, when taken into the lungs and stomach, which are equally debilitated with other portions of the body from the long fast since supper, is very readily absorbed and enters the circulation within an hour or two, poisoning the blood, and laying the foundation for troublesome diseases; while in winter the same debilitated condition of these vital organs readily allows the blood to be chilled, and thus renders the system susceptible of taking cold, with all its varied and too often disastrous results. Some will say, look how healthy the farmer's boy is, and the daily laborers, who go to their work from one year's end to another by "crack of dawn!" My reply is, if they are healthy, they are so in spite of these exposures; their simple fare, their regular lives and their out-door industry, give their bodies a tone, a vigor, a capability of resisting disease, which nullifies the action of malaria to a very considerable extent.

Dangerous Houses.—Houses that have been empty may become fever breeders when they come to be reoccupied. An English sanitary officer alleges that he has observed typhoid, diphtheria, or other zymotic affections to rise under these circumstances. The cause is supposed to be in the disuse of cisterns, pipes and drains, the processes of putrefaction going on in the impure air in them, the unobstructed access of this air to the house, while the closure of windows and doors effectually shuts out fresh air. Persons moving from the city to their country homes for the summer, should see that the drains and pipes are in perfect order, that the cellar and closets are free from rubbish, and the whole house thoroughly aired before occupying. Carbolic acid used freely in the cellar is a cheap and good disinfectant.

The Treatment of Sprains. Mr. Dacre Fox, an English surgeon to a large railway company, who has had considerable experience of this form of injury, says that in the more severe cases he finds that after a few days of fomentation the best treatment is regulated pressure by means of carefully adjusted pads and large plasters of a special shape, varying according to the particular joint involved. By this plan he feels sure that it is possible to control the effusion into the sheaths of the tendons and adjacent structures, to lessen the pain, and to shorten the duration of treatment.

Treatment of Diphtheria.—Dr. Bachelder, in an Australian journal, says: "I would suggest to physicians, in treating diphtheria, to use internally a very weak solution of carbolic acid, and for the throat or fauces a solution of hydrochloric acid, about the strength of strong cider vinegar. I have treated every case successfully, so far, with the above remedies. Croup is instantly relieved by the acid solution. Apply it to the throat with a brush or sponge, or use as a gargle."

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, March 22, 1879.

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The Week.

Better times are coming. The Eastern journals—especially in New England—speak in encouraging terms of the indications about them of the improvement in business, and the late plentiful rains here, have assured us of such bountiful harvest, that the turn in the tide of business affairs seems evident, though necessarily slow in making itself manifest. In other countries the dull times and attending distress continue unabated. Wages have been generally lowered throughout England, and large numbers of the laboring classes thereby rendered destitute. Colonization seems to have been decided upon as a remedy for these troubles. Several schemes have been projected in England, Ireland, Germany and France, to settle colonists in America, and Italy has a large band of immigrants en route for New Guinea. After months of patient talk and negotiations the Sutro Tunnel Co. and the Comstock mines have at last effected a compromise. This is good news to all concerned, for not only is it a benefit to the mine owners themselves, but to the miners also, hundreds of whom are now out of work at Virginia. The land contest between the Railroad company and the settlers of Tulare county is assuming a rather threatening aspect. The latter have organized six military companies under the State laws, and declare their intention to resist all attempts to deprive them of their homes. The action of the government concerning Alaska seems peculiar. Sitka is only protected by the presence of a British man-of-war, and yet the government seems in no hurry to send an efficient force thither to protect its citizens, though the necessary means —the man-of-war *Alaska*—is on hand in this harbor waiting for orders, which up to Thursday morning had not been received.

Relative Increase of Gold and Silver.

There is a class of public journals in both the United States and Europe that, during the discussion in regard to the status silver should occupy in our national currency, held to the view that this metal was increasing the world over much faster relatively than gold, for which reason they expressed the opinion that it should suffer partial demonetization, at least, some of these journals being purely monometallic in their notions. And now comes to hand an English paper largely devoted to the consideration of financial economies and kindred topics, wherein this view is reiterated, and the fear expressed that much inconvenience and possibly loss will ensue from this threatened disturbance of the equilibrum that has heretofore existed between ths precious metals. As these are journals of wide influence, who's opinions with many will he accepted as authoritative, it may he well to examine this question a little and see if they have not fallen into an error.

During the three centuries preceding the discovery of gold in California, Mexico and South America heing then the principal bullion-producing countries of the world, the stock of silver was, no douht, heing replenished at a much more rapid rate than that of gold; the reason that the former did not accumulate to a troublesome or even marked extent, heing that India, which had meantime been opened to the trade of European nations, so absorbed this metal as to prevent such result. Since the discovery of gold in California, followed soon after hy like discoveries in Australia, the previously prevailing condition of things has been reversed, gold production having heen largely in excess of that of silver. Since 1848, when gold was first found on this coast, the value of all the bullion turned out in the countries lying west of the Missouri river, and mostly within the limits of the United States, amounts to a little over $2,000,000,000, of which $1,625,000,000 has been gold and only about $400,000,000 silver. That is, there have been added to the common stock of the precious metals during the past 30 years, four times as much gold as silver.

From 1849 up till 1862, when the Washoe silver mines began to make a notable yield, the disproportion was largely on ths side of gold. From 1862 the production of the two metals tended towards equalization, that of gold, which some years before had begun to fall off, continuing to decline while silver increased. This increase has not since been so great, however, as is generally supposed; first, because the so-called silver mines have themselves yielded a large percentage of gold; and secondly, because at ahout the time that the mines of California and Australia began to sharply contract their yield new sources of gold production were opened up, which went far toward counteracting the falling off that had occurred in these countries. In 1858 British Columbia began to contribute on the gold-increasing side of the question, followed successively during the next ten years hy Oregon, Idaho, Montana and Colorado, whose aggregate output has been largely on the same side.

Nevertheless, as before remarked, the general tendeucy has been towards equality, there having been but little difference between the value of the two precious metals produced on this coast for several years past. Last year the figures stood as follows: gold, $38,956,231; silver, $38,746,391. The preceding year the ratio was about the same, nor is it likely that we shall experience any wide departure from this rate for the present at least. There will unquestionably occur hereafter a large absolute increase of the precious metals throughout our Pacific States and Territories; the variations in the relative production, should any happen, heing in favor of gold. The bullion returns for California for 1878, as compared with the year before, show an increase of more than two millions in gold, and a decrease of nearly a million and a half in silver. In Montana the difference, though less, was the other way. In the other Pacific States and Territories there has during the past two or three years been but little change in this respect, Dakota having quite recently come in as a new gold factor.

While this equalizing process between the precious metals has so been in progress here, nothing of the kind has been going on in the other large bullion-creating countries of the world. In Australia no argentiferous deposits have been found or at least reported, while, for the past few years, there has been a slight increase in the gold gatherings of that country, partly through the discovery of new fields, and partly through a more general and successful working of the quartz reefs, of which they have great numbers and which must ultimately become a source of immense gold production. The Russian mines, in which country, too, the deposits are exclusively auriferous, turned out last year $23,250,000, it being generally understood that this industry is still quite in its infancy there, the methods and appliances employed in mining heing imperfect and vast regions remaining to be explored.

In Chile and various other States of South America there exists extensive deposits of auriferous gravel which, worked hy the hydraulic process, would no doubt prove highly prolific and profitable. Operations upon some of these deposits are about to be commenced, with every prospect that they will rapidly extend, and bringing enrichment to the owners, will through them add much to the common treasury. In the Transvaal (South Africa) gold mining employs a considerable population, and as they have extensive quartz reefs there also, the business promises to grow into a large, permanent and profitable industry. In Georgia, Virginia and the Carolinas gold mining, interrupted by the war, has lately been revived and is being extended at a rate that will insure for that section of the country no mean production in the course of a few years.

As in Australia, Siberia and Africa, so in the Southern States we hear nothing of silver lodes or silver mining, the only countries where this latter business seems likely to undergo early and marked enlargement being in Mexico and throughout certain States and Territories lying in and adjacent to the great interior basin, where also gold production will keep almost even pace with silver.

A Sub-aqueous Excavator.

At this time when the navigation of our rivers is being threatened with serious obstruction from the formation of sand bars and other depositions along them, anything that will enable us to remove these impediments in a cheap and effectual manner cannot fail to be regarded with general interest. In this view of the subject we append a brief description of a steam dredging boat, or sub-marine excavator, lately invented hy Dr. Thos. B. Carr, of Wilmington, N. C. This dredger is constructed and operates as follows: To the bow of a small stern-wheel steamer is affixed through bearings a strong upright iron bar, to the lower end of which is attached a double mold-board plow. The upper end of this bar forms a screw furnished with a wheel for raising and lowering it. To each wing of this plow is pivoted a bar running back and carrying a number of single mold-board plows, these bars being raised and lowered hy levers worked on the deck. By means of these levers and the screw bar at the bow, the entire gang of plows can be lifted and lowered as occasion may require. As the steamer advances this set of plows enters the sand bar or material to be removed, and stirring it up the sediment is loosened and swept away hy the current. Where the latter has not sufficient force to accomplish this, a centrifugal pump will be used, with which the material will be taken up and deposited into tank flats, or be discharged through troughs on each side of the boat, which will carry it off to a distance of 30 or 40 feet, making a channel from 60 to 80 feet wide. The machine, so far as tested, has been found to work well, and might perhaps do good service in helping to keep open navigation on the Sacramento and others rivers on this coast.

ARIZONA'S COPPER MINES.—The *Enterprise* in speaking of the very valuable deposits of this mineral, says: The copper mines of Arizona are rich and extensive, and with the advent of the railroad their worth will he appreciated, and capital invested in them will pay large dividends. These mines are found in every part of the Territory, and wherever they have been worked their richness has been made manifest. At Planet, in Yuma county, the mines have been worked ever since 1863, and work only shut down when copper suffered such a fall in price that they could not be made to pay the great cost of transportation and a handsome dividend besides. But with the advent of the railroad, transportation becomes easy, and copper ore, which without it would be worthless, now becomes of some value. At Clifton the mines have been made to pay well, although the ores had to be hauled hundreds of miles to the railway. In this county and Mohave county are many copper mines which show well, and, no doubt, before long they will be as much sought after and pay as large dividends as the richest of our gold and silver-hearing veins. We venture here to predict that before many years have passed Arizona will be the great copper-producing section of the United States.

NEW QUARTZ MILL.—A pair of the new Anderson ore stamps have recently been completed at the Pacific Iron Works, and are nearly ready to run, on the corner of Main and Harrison streets, in this city. This mill is a very ingeniously devised one of peculiar construction, made to run at very high speed. It is on an entirely different principle from any heretofore constructed, and looks as if it would do good work. As soon as the mill is running, we shall give a detailed description of its construction and operation.

THE Albany express recently ran over and killed a catamount which attempted to cross the track, between Jefferson and Marion stations, Oregon.

THE people of Pilot Rock, Umatilla county, Oregon, are building a fort 75x200 feet for the protection of families in case of an Indian war during the coming summer.

The Perils of Stock Speculation.

As a mining community we on this coast take a just pride in the rapid and effective manner in which we have developed our various forms of mineral wealth and made the improvements necessarily connected therewith. We have, to be sure, fallen into some mistakes; been a little wasteful and sometimes, too, a little over-sanguine, spending more money than we had counted upon and otherwise coming short of our calculations. But our record, as a whole, is one of which we may well feel proud. This is more especially true of what has been accomplished on the Comstock mineral range, where we have brought the business of vein mining and ore reduction to its greatest perfection, all that is best and most advanced in the mining industries of this coast finding there apt illustration. It is easy to find fault with the manner in which some things have been done even on the Comstock belt; it is easy for those who have had no practical connection with the working of these mines to criticise the men upon whom the onerous duties growing out of their management have been imposed. But it is doubtful if any set of men could or would have done the work any better. It was no ordinary task these men had to perform, and if sometimes they fell into minor errors these are not to he held up as evidence of incompetence nor commented upon in a censorious spirit.

But while the business management of the mines as well as their financial administration has been so generally unexceptionable, there has been a system of stock operations practiced in their names and ostensibly for their benefit, that will hear and even invites sharp criticism, and which, for the good of the large class who have suffered through the same as well as for the credit and true interests of the mines themselves; should meet with reproof and find early abatement.

In looking over the transactions of the San Francisco Stock Board for 1878, it will he noticed that the fluctuations in the prices of the leading Comstock shares have been sharp and frequent, these prices going up on occasions all at once from three to six, and even eight or nine hundred per cent., and then relapsing to former figures quite as suddenly, no corresponding change, and, in fact, no change whatever, having meantime occurred in the condition or prospects of the mines. In a few instances, as in the case of the Sierra Nevada, the Ophir, and two or three other mines perhaps, notable improvements have occurred, but even here the mining outlook has had but little to do with these rapidly advancing and receding prices, which have been brought about generally through extrinsic and foreign causes; having taken place not only in ths shares of mines that showed no change, but also in those that were not being worked at all.

These movements were, for the most part, based upon nothing substantial or tangible, having been effected through the machinery commonly employed for influencing the stock market; and yet they caused the prices of Comstock shares to fluctuate in the course of a single month to the extent of many millions. It is probable that an inventory of these shares might have been taken at several periods in the course of the year that would have showed a difference of from thirty to fifty million dollars in their aggregate nominal value.

To speculate in a species of securities liable to undergo such extreme and sudden changes irrespective of their intrinsic merits, must necessarily be a hazardous business to one not informed as to the manner in which these changes are brought about, nor likely to he advised as to the time of their occurrence. To most persone of small means dealings in these shares are therefore to he avoided. The rich and well-to-do, with their superior opportunities for obtaining correct information, both as regards the condition of the mines and these inside movements, and with their ability to better sustain losses, should they occur, can afford to take these chances; but not the poor man, who, if he desires to invest his money in this direction, should purchase shares in only productive, dividend-paying mines; or better, perhaps, if he does not care to go into the business himself, to become one of a small company to buy a cheap mine already opened, or to locate one, and having put it in shape, work it on joint account. The development of the Comstock lode is a heavy job, and should he left to the rich and experienced, who will he able to manage it without the assistance of those who are ignorant of the business, and have little to spare; and whose aid, while it can do little towards accomplishing the main object, may he the means of impoverishing the contributors in the end.

ARTESIAN WELLS.—One of the Pierce Well Excavators, which we recently illustrated in the MINING AND SCIENTIFIC PRESS, has been brought from the East hy the California Artesian Well and Mining Co., 202 Sansome street, and is now at work on a well at the Odd Fellows' cemetery. Only the earth auger is at present being worked, no rock having yet been met with. The whole apparatus, however, is ready for work to suit any kind of rock. It is all run by horse power.

THE Alaska Indians are rapidly preparing for war. The colonists are protected hy the vessels *Osprey* and *Oliver Wolcott*.

Arizona.—No. 1.

Capt. Wm. H. Seamans, who has recently returnsd from Arizona, hae kindly furnished ne many intercsting notes from different parts of Arizona visited hy him, which we ehall give briefly in this and future numbers of the Press.

In the Bradshaw Mountains.

The mountains known in Arizona hy thie gensral namo, comprise a group of ranges of different titles beetowed by the Spanish occupants of ths country, which may bo describsd as the coutinuation of the Sierra Madre of Mexicn, aud as terminating toward tho uorthwest at the great bend of the Colorado river near Callville, and to the south this particular range falle away into the great plain bordering upon the Salt and Gila rivers. They are in somc respects related to the Sierra Nevada, forming the western rim of the Colorado plateau; and containing granitic rocks with metalliferous lodes.

Theee mountains ars full of gold and silver-bearing vsins, with a etrong sprinkling of iron and copper. And, perhaps it ie hest to say, in ths heginning, that they have not yst heen efficiently developed throughout, to demonstrate which mines will hs finally worked to the greatest eatiefaction of the etockholder. The reader may form his own opinions of that eubject from the facts.

I have visited probably a hundred mines and mining claims in the Bradshaws in company with Prof. James Cherry, a fine geologiet and mining engineer, traveling with him nearly 200 miles and having tbe henefit of his knowledge and experience in mines and mining, which wae excesdingly intereeting and inetructivs to me. The Bradshaw region is divided into varioue mining districts—the Peck, Tiger, Lynx Creek, Turkey Creek, and Haeeayampa, besidee numerous othere.

The Tiger mine ie tbe representative mine in the Bradshawe, and it is attracting more attention, perhaps, at present, than any other mine in that region, having given its name to the district. It is 41 miles south of Preecott, and is reached by staging 31 miles, and tbe balance of the distance, 10 milee, by trail. The Tiger ie located in the heart of the Bradshaw range. It has a vein 75 feet wide between the walls, the ore body in the aggregate being about 12 feet thick. There are two main ore bodiee in two different seams, hesidee eeveral mineral-hearing etringere. The banging wall is of elate and the foot wall of granite.

The present working ehaft is down 200 feet. They have in the aggregate 2,000 feet of drifte and tunnels run, exposing a sulphuret ore rich in native eilver, of which the company claim to have over 300 tons on the dump expected to run $500 a ton. They have just completed new and powerful hoisting worke, and are sinking a new ehaft which it ie intended to carry down to a depth of 1,000 to 1,400 feet, in order tn etrike the ore body where the various seams and stringere are expected to come together. They have under contract and now on the way a ten-stamp mill, and a White's roaeter, which, it is expected, will be in opcration abeut the middle of May.

The euperintendent of the Tiger, Mr. Helm, saye he expecte to give back to the etockholdere iu about eix weeke after starting his mill, all the money they have invested, amounting to $200,000. I know of a mining engineer who offered to put up a $75,000 mill on their mine for them if they would givo him the first thirty days' run, and they declined the offer. There are now employed on the Tiger about fifty men, which in addition to those engaged in putting up the mill and placing the machinery, makes the Tiger one of the most lively mining camps in this part of the Territory. There are two boarding houeee, both full, and it is difficult to get accommodations of any sort on account of the number of people coming in.

It ie an exceedingly hard camp to reach, being enoompassed by bigh mountains, and is reached from the east by a difficult trail from the Peck mine, ten milee, or from the west hy tbe Walnut Grove road, which in placee ie almost perpendicular. The elevation of the Tiger ie about 6,500 feet.

At the time I was there it was closed to all outeidere. I got my facts mainly from the superintendent himself, but had them corroborated hy outside information, so that they may be depended upon as correct.

The other mines in the neighhorhood of the Tiger are the Hammond and Riggs, which is a prolongation of the Tiger ledge toward the northeast, and into which a tunnel has been run to a considerahle dietance, showing very favorable indications. There is also the Linn and the California, which claim to be upon the Tiger ledge. I think, however, that they are mietaken in that supposition. They also ehow favorable indications, and have been opened to a considerable extent.

We will furnish our readers with a hirdseye view of Arizona, in a seriee of articlee in the eneuing numbere of the Press,

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There is now nearly $1,000,000 in eilver coine etored away in the vaults of the U. S. Mint in Careon City.

President Grevy has eigned a decreo pardoning 151 communiste,

Boiler Explosions.—No. 3.

[Written for the Press by H. W. Rice.]

Engineers who philosophize upon tho canses of boiler explosione, aro actuated by different motives. While one does so with the sole intentiou of ehowing how much he knows, another labors earneetly to elucidate or demonstrate eome favorite theory, which he claime to be tho only true cause of evsry explocion. Any uarrow-mindednees is fraught with great danger, as euch ideas coming before the minde of uuskilled pereone, carry weight which ie likely to prejudice eound judgmsnt. One engineer argues and maintaine that a boiler workiug under full preeeure, carrying its full amount of water, can have the water driven entirely away from tho eides of its furnace plates by heat from a coal or wood fire. In thie case, eteam is formed betwesn the hot plates and the water inside, and the water is not allowed to touch or coms in contact with the iron. Nn harm can come from believing thie theory, as it would cauee the boiler-maker to be careful and have large heating surface and dietribute the heat eqnally over it, and would caution ths engineer gainet overworking his hoiler. The theory that eome wonderfully explocive gas collects in boilers, ie a favorite one with those who are pleased to explain everything as very strange or myeterious. We know that water is composed of only two elements, alwaye found in exactly the eame proportions, and whether we call it "nrotoxide of hydrogen" or "aqua fluvialis," it does not changs the fact that it is water, and ie composed of oxygen and hydrogen only. It is true there is in rain-water the least preeence of nitric acid, in combination with ammonia, and water almost always contains a little organic matter; hut with all the reeearch that has been made, no demonstration of the existence of substaucee capable of producing explosive compounds has heen made.

I helieve that we are warranted in tbe conclusion that explocions are caueed either, first, by faulty construction; eecond, by careleesness or reckleeeneee in the management; tbird, by lack of knowledge and ekill. It would be a glorioue privilege if there wae a department in schoole where inetruction could be had, and where practice with working engines and hoilers could be obtained and their actual working eeeu and demonetrated. It would certainly be of more importance in eaving the lives of men than the practice of students in civil engineering, surveying and other hranchee of ecience wbere no lives are in danger from mistakes caueed by lack or want of skill in the art.

A eingular explosion of a threehing boiler—according to etatements obtained—occurred near Livermore, a few years ago, which killed the fireman, and made almost a worthlese wreck of the whole machinery. We eaw the wreck after it had been removed to our city, and the particulare of the affair were obtained from its owner, who was an eye-witnees of the explocion. As he claims to he a mecbanical engineer, practical in the uee of hoilers, and acted the part of an expert at the Coroner's inquest, we will give his own version, with his theoriee: The boiler wae furnished with a gauge or water glass on each end and two eets of gauge-cocks. It also had two eteam gauges, one on each end of the hoiler. Some time before the explosion it had been used with 150 pounds pressure for two days. At the time it exploded the gauges showed 79 pounds. This he saw himself not over one minute before the explosion took place. He is confident that the whole machine was raised to a hight of 100 feet in the air; at least it so appeared to him, and as it dropped on to ground lower than where it stood when it started, it was not in very good order for businees. We extract the following from the Livermore *Enterprise*, August 12th, 1876:

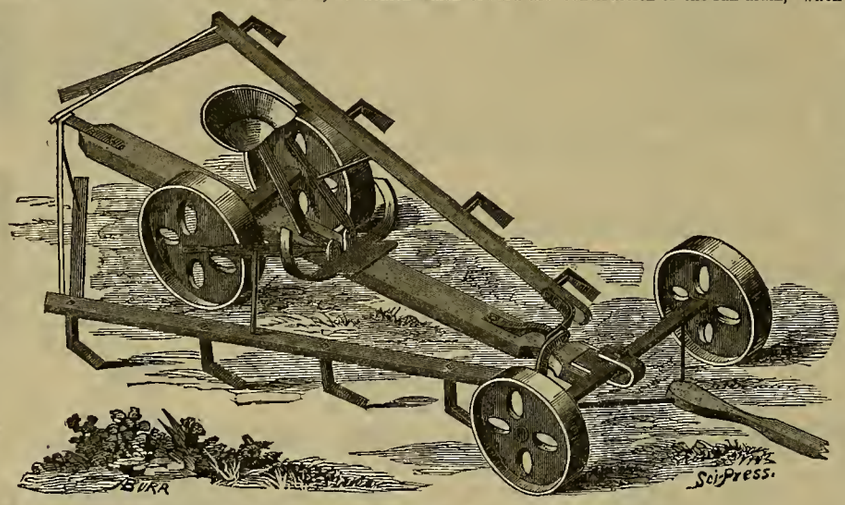
"The cause of the disaster, as stated by the engineer, appears to have been the unlevel situation of the engine. The ground where the engine stood, was sloping, and it was supposed that eufficient blocking-up on the lower end had not been done to correct the incline and level the engine. Some threshing had been done, possibly half an hour's work, when a stop was necessitated by the fall of the belt off the fly-wheel. Upon making tbe start after adjusting the belt, the blow-up occurred. The force of the burst was terrific. No time for thought or reflection, or presence of mind. A crack and a bang, and all was over. Three men were pitched off their feet and rolled down the hillside half stupefied; another was shot into the air and fell full 60 feet from the engine—this was the unfortunate fireman. The engine bounded nearly 50 paces, and fell, wheels uppermost. The concussion was so great that the men working on the derrick wagon and separater were struck down like so many tenpins. Large pieces of iron were projected with such force at the separator machine, as to break several parts of it. A piece of iron weighing quite 50 pounds, was discharged clear over the separator, and fell 193 feet beyond."

It would esem from theee recitale that this was ono of ths mysteries which could not be explained. If tbere are no mistakes, then it ie not safo to have steam boilers, and we ars liahle to wake up in eternity at any moment when we are paesing them, though they be carrying only a moderate pressure. It may uot be inappropriate to aseert that there is undouhtedly a true cause for every explosion. If the bearinge aud circumstances are carefully etudied the myetery would diseolve like dew in a eunny morning.

The Sutro Compromise.

A fiual agreement between Mr. Sutro and the Comstock mining companiss wae arrived at on Monday last, and will go into effect as soon ae the papere, which are now beiug drafted, can be signed, eealed and deliverod. The terme of the compromise are not to be made public till after the signing, but it ie generally understood that they are in eubstance the eame as the agreement drawn up and rejected some time ago. All the minee intereeted in the tunnel are included, and eome conceeeions have been made on both sides. Among the terme inserted is a clause to the effect that the companies ehall furnieh 1,000 men toward the conetruction of the suh-drain, for the completion of which 90 days' time ie given. There is no reason to believe that the execution of the contract will be deferred more than two or three daye, and immediately on its ratification the mine managers will take stepe towards utilizing the tuunel. At least 400 men will he sst to work on the euh-drain, and work on lateral shafts will also be commenced.

This will give employment to many minere now idle, and cause the newe of the compromise to be bailed with earnest eatisfaction by a large claes of people. It will probahly be a month or more, however, hefore the flooded minee can be drained, for at least that time is required for the completion of the suh-drain and the eetting up of the necessary machinery for pumping out the water.



P. S. RUSSELL'S IMPROVED CULTIVATOR.

Russell's Cultivator.

An engraving on this page ehowe an improved cultivator, recsntly patented through the Mining and Scientific Press Pateut Agency, by Prior S. Russell, of Rivereide, San Bernardino county. This is a wheel cultivator, and the frame carrying the teeth is arranged eo as to lift the teeth from the ground. The engraving ehowe ene sids raised aud the other down, so as to illustrate the two different poeitions.

The central beam is eupported on the axles and wheels, the rear axle heing mads short en that the wheels may be inside the timhers or winge which carry the teeth.

A tongue is attached to the front axles, to which the horsee are harneessd, eo that the driver on his seat has complete control over the cultivator, the front axle being swiveled to the beam, and the cultivator can bs guided with great ease.

The cultivator proper, formed of the two beams or wings, ie A-shaped. The front ends havs curved hars attached to them, which hare aro pivoted on the bolt on the heam, as ehown, so that the wiugs may he raised and lowered at will. At the rear ends of the winge are the brace-bare, pivoted to the rear end of the beam. In the center of each wing is an upright rod, faetened to the hand-levers, which levere are pivoted to the central heam, as shown, and ratchet-bare on the central beam lock the levere in any desired position, so that the eide winge may be kept down or up, as desired. Thie raieiug aud lowcring of the eide wings ie poeeible for the reason that they are pivoted or hinged to the center beam at both ende. As these wings can be raised entirely clear of the ground, the cultivator can travel to and from the field with great facility.

Either wing may be moved independently when at work, to clear it of weede or raise it over rocks or other obetructions. At the rear end of the brace-bare on each eide extende downward a rod, at the lower end of which is secured a knife or blade, the other end of which is fastened to the rear tooth of the wing. These hlades or knives are secured in euch a manner, that, when the eide winge are down and at work, the knivee move horizontally through the earth and cut off any weeds which may bave escaped the teeth, leaving the ground perfectly clean.

The wheele are made broad on the face, so as not to eink into the ground or allow the cultivator teeth to go too deep. The teeth are made with their points inclined, eo as to turn or break the eoil up as they are dragged through it; but the wheels prevent their digging eo deep ae to make a heavy draft for the team.

The arrangement of the wings with teeth aud cuttere, eo as to be raised clear of the ground, enables the operator to travel to and from the field with facility, and either wing can he raieed while at work and cleared of weede or rubbish. Any weeds which escape the teeth are cut by the cuttere, eo that the field ie thoroughly cultivated.

This cultivator is intended principally for orchards and vineyard work. It pulverizee the ground to the depth of four or five inches, at the will of the operator; and hy means of the tongue and seat the driver has complete control over hie team and machine, thereby heing able to work close to the rowe of trees or vinee without injuring them. For further information, the inventor may be addreseed as above.

The Quicksilver Mines of Old Spain.—We have received a pamphlet of eome 50 pages, heing a memoir prepared by M. H. Kuss on the "Quicksilver Mines and Worke of Almaden." The contents of this pamphlet, translated from the French hy S. B. Chriety, appeared originally in a series of articles published in the Mining and Scientific Press, where they awakened so much interest ae to justify their collection and reissue in the above form. This little work givee a full, intelligent and reliable account of the geological depoeite at Almaden, as well also as a complete description of the exploitation of theee celebrated mines, their administration and history, and the metallurgy of mercury as practiced there. The book can be obtained from the publishers, Dewey & Co., No. 202 Sansome etreet, S. F., who forward it for 50 cents per copy, post-paid.

Hercules Powder.—We call the attention of our mining readers accustomed to use high explosivee to the card of the Hercules Powder Company, which appears in auother column. We have received this week a pamphlet which appears to contain a great deal of information concerning Hercules powder and other high explosives, and to which we ehall refer after having an opportuuity for a more careful examination.

Six murderers were hanged on the 14th, two in Oregon, one in this State and three in New England. Capital punishment appeare to he gaining favor.

About 6,000 people were drowned by the Szegedin flood.

A Bruckner Pulverizing Barrel, for cruehing oree, bas been set up at the Central mills, on Berry etreet, between Fourth and Fifth, and is now at work. Mining men will do well to examine this barrel, which has been very succeeeful wherever tried.

The Tulare valley farmers are arming and organizing military companies under the State provisione, to resist the occupation of their lands by corporatione.

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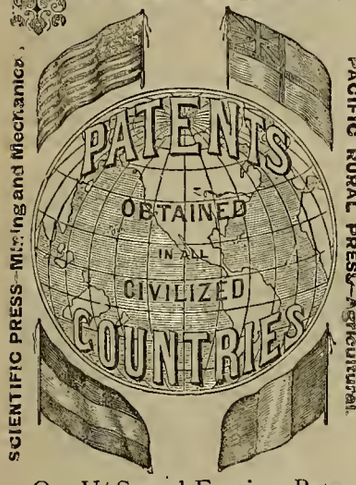

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A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

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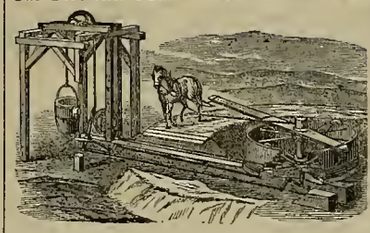

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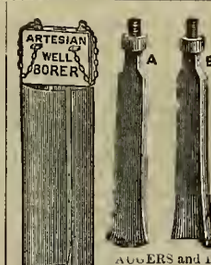
Dewey & Co {202 Sansome St.} Patent Ag'ts



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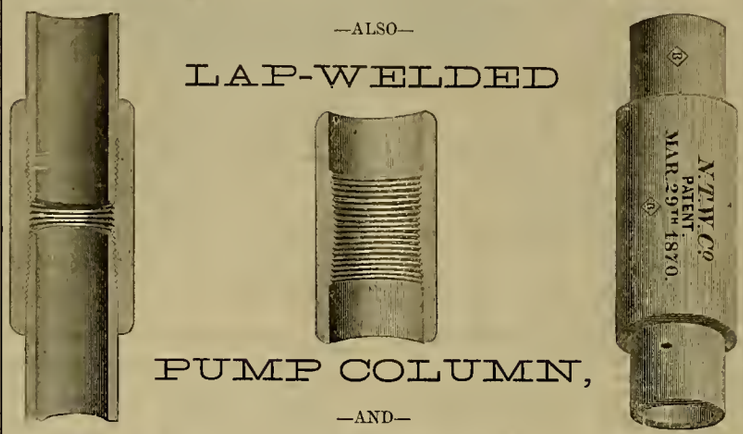

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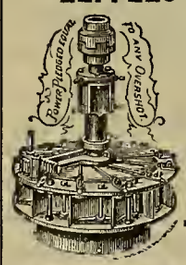

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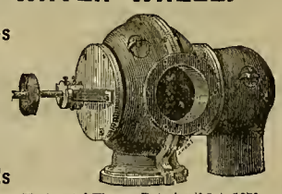

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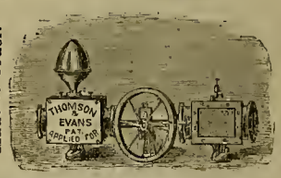

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[Continued from page 181.]

REESE RIVER DISTRICT.

MANHATTAN.—*Reveille*, Mar. 15: The ore body being developed in the 517 drift of the Curtis shaft improves daily as the drift is extended. It has now been advanced in the ore some 30 ft aud a stope is being opened up. The 560 stope is now only being worked on the bottom ledge and contains some very rich ore. The stope in the 825 level carries a large ledge of high-grade ore. Sinking the winze in the 600 west drift of the North Star shaft continues with good progress. A drift has been started on the ledge found in the footwall of the 600 east drift which carries very good ore. This body of ore is directly under that now being worked on the 560 level of the Curtis shaft and undoubtedly continues up to tbis level which is about 130 ft on the ledge.

SILVER STATE DISTRICT.

THE BLUE BELL MINE.—*Silver State*, Mar. 17: Col. Buel has attained a depth of 23 ft on the Blue Bell mine. The ledge looks well in the bottom of the shaft. The lead is four ft and one inch wide, by actual measurement, at the bottom of the shaft. The country rock is much softer than it was near the surface, and tbe ledge dips at an angle of about 50°, west.

COLORADO.

HARRINGTON & SPRINGFIELD.—*Courier*, Mar. 13: Tbe property is opened by an adit 230 ft long, that has been run on the Harrington lode, and at a point 156 ft from the adit's mouth a crosscut has been driven south 65 ft to the Springfield, which has a sharp dip towards the former, and probably joins it at no great depth. This crosscut shows the Harrington lode to be eight ft wide, then comes a body of country rock nine ft tbick, then crevice rock for 24 ft, which is probably the main lode, aud then country again for 22 ft, when the Springfield lode is reached. At the discovery of the Springfield there is a fine looking streak of galena ore, but where the crosscut intersects it but little ore is in sight and that badly scattered through the quartz. A short distance beyond the crosscut, the main adit runs into the large lode and follows a vein of gouge and decomposed ore near the north wall for a distance of 60 ft. The lode is large and soft, so that at tbis depth, about 150 ft perpendicular, it is subject to the action of water, which has decomposed the ore and nearly the whole mass is more or less stained from the effects of it. For the last 60 ft the adit bas followed a slip in the crevice, upon which was a vein of gouge and ore that has increased in size as the drift has been driven, until now in the breast it is about one ft wide at the top and two at the bottom, and also carries considerable solid as well as decomposed galena; solid chunks as large as a hen's egg now being found in the vein. At this point work is now going forward, it being the desire of Mr. Harrington to reach solid ore as soon as possible.

THE EQUATOR.—This company has started a crosscut tunnel at the foot of the mountain in lower Silver Dale, that will cut their lode at a depth of between 500 or 600 ft; or in the neighborhood of 200 ft deeper than the Marshall tunnel cut it. The tunnel will be nearly 1,000 ft long, and 7x8 ft in size, large enough for a double track. It is being run by contract, by Richard Nankwell and James Coran, who have completed 50 ft and started on their second 50-ft contract.

IDAHO.

SNAKE RIVER PLACERS.—Cor. *Statesman*, Mar. 11: Mr. Corker and Mr. Corbell came down from Salmon Falls and began work, taking out a ditch from Suake river to work tbeir claims. They have ordered plating from San Francisco and will open up soon. Messrs. P. H. Clark and William McGinuess are busy at work taking out a ditch for their ground at the mouth of Cold Spring creek. They have sent for plating and will be running in about two weeks. The miners are rushing iuto the Cold Spring district, locating ground very fast. Mr. Black, of Black's station, is in this district and has located 160 acres for a company of Boise men. Mr. W. L. Thurman has a man out prospecting for him and three others, and has located one half a mile below the mouth of Cold Spring creek. Mr. A. L. Richardson, on his way through to Salt Lake, located alongside of Thurman's claim. There are a lot of men just arrived here to-day from Nevada.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

JOHN G. M. Co.—Capital, $10,000,000. Directors—Wm. Kobl, C. T. Bridge, W. E. Sill, W. T. Jones and D. T. Davies.

MOORE M. Co.—Capital, $1,500,000. Directors—C. J. Garland, Sampson Tarus, O. C. Hewitt, E. C. Voorhies and E. Ginocohio.

OLETA G. & S. M. Co.—Capital, $10,000,000. Directors—Albert Jenks, J. J. Scoyille, W. T. Henson, Henry Oerdes, C. Gierrez, Percy Freligrath and F. E. Birge.

NORTH MEXICAN S. M. Co.—Object: To operate in Virgiuia district, Story county, Nevada. Capital, $10,000,000. Directors—B. W. Mudge, F. P. Howard, W. H. Weidman, C. C. Fisher and T. A. Mudge.

McKINLEY CON. G. M. Co.—Object: To operate in Bodie district. Capital, $10.000,000. Directors—I. W. Gashwiler, T. H. Lawler, William H. Sharp, E. B. Clement and W. H. V. Cronise.

MONITOR M. Co.—Capital, $10,000,000. Directors—Thomas Price, J. P. Allen, H. Mayers, George W. Smiley and J. S. Allen.

MAMMOTH M. Co.—Object: To operate in Humboldt county, Nevada. Capital, $10,000,000. Directors—J. H. Crossman, G. B. Briter, Edward Hall, B. W. Mudge and W. T. Robinson.

SAN GERONIMO G. & S. M. Co.—Object: To operate in California. Capital, $10,000,000. Directors—A. S. Higgins, C. B. Higgius, A. Peck, George Stone and E. A. Peck.

IVANHOE M. Co.—Capital, $10,000,000. Directors—R. C. Hooker, George B. Root, W. W. Foote, Frank Vernon aud J. F. Cowdery.

AMADOR TUNNEL, MILL AND M. Co.—Capital, $2,500,000. Directors—Charles J. Pilsbury, Arthur B. Cruickshank, Edward C. Mactarlain, J. H. H. Williams and W. L. Locke.

McKINLEY CON. G. M. Co.—Object: To operate in Bodie district. Capital, $10,000,000. Directors—f. W. Gasbwiler, Thomas H. Lawlor, William H. Sharp, F. B. Clement and W. H. V. Cronise.

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ÆTNA M. Co.—Object: To mine in Nevada. Capital, $10,000,000. Directors—Thomas H. Lawlor, J. S. Benear, A. F. McGrew, C. C. Conger and C. M. Arnold.

BLUE BELL M. Co.—Object: To operate in Humboldt county, Nevada. Capital, $10,000,000. Directors—L. S. Robinson, J. W. Gashwiler, M. L. McDonald, J. M. Getchell and W. H. Sharp.

GORGON CREEK M. Co.—Capital, $100,000. Directors—J. D. Oray, J. W. Musser, W. C. Chapin, F. D. Brandon and B. C. Jackson.

GOLG BANK GRAVEL M. Co.—Capital, $100,000. Trustees—J. F. Miller, J. Arthur Fairweather, E. L. Willard, G. A. Treadwell and O. D. Squire.

IT is reported that the country is flooded in Big Valley, Modoc county, so that the mail is carried in boats over the road for a long distance.

IT is announced that on April 1st there will be a general reduction in the freight charges of the Virginia and Truckee road.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. ANG FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDINO MARCH 11TH, 1879.

213,154.—IMPROVEMENT IN CONSTRUCTION OF BRIDGES—E. Williams, S. F.
213,153.—CAR BRAKES—A. Weymouth, Livermore, Cal.
213,117.—AXLE FOR VEHICLES—E. E. Lincoln, San Jose.
213,052.—IMPROVEMENT IN LAMPS—D. Lubin, Sacramento, Cal.
213,134.—IMPROVEMENT IN DENTAL PLUGGERS—H. Richmann, S. F.
7,106.—LUBRICATING COMPOUND—Trademark—Bean, Bracey & Co., Virginia City, Nevada.

FOR THE WEEK ENGING MARCH 18TH, 1879.

213,399.—BIT STOCK—L. C. Di Bert, S. F.
213,386.—VEHICLE SPRING—O. S. Carville, S. F.
213,382.—APPARATUS FOR OBTAINING METALLIC COPPER FROM ITS SOLUTIONS—C. C. Bitner, Spenceville, Cal.
213,400.—WAGON BRAKE—J. F. Ditsworth, Austin, Nev.
7,120 to 7,124 inclusive.—CANDLES—Trademark—W. T. Coleman, S. F.
7,125.—CLOTHING—Trademark—Heynemann & Co., S. F.
7,112.—CANDLES—Trademark—Castle Bros., S. F.
7,114.—CATHARTIC MEDICINE—Trademark—E. DePrati, San Francisco.

The names of the following persons and the patents granted them have through some irregularity been inadvertently omitted from the lists which we print each week:

FOR THE WEEK ENDING JANUARY 7TH, 1879.

211,125.—HYGRAULIC PUMPING SYSTEM—W. P. Barclay, Virginia City, Nevada.
211,235.—DEVICE FOR OBTAINING MITER BEVELS—W. Harbaugh, Alameda, Cal.
211,155—DEVICE FOR PREVENTINO OVER-WINDING—H. C. Harrison, Eureka, Nev.
211,248.—AMALGAMATOR—J. Michel, Nevada City, Cal.
211,269.—HAY RAKE—F. Shedd, Shedd Station, Ogn.

FOR THE WEEK ENDING JANUARY 14TH, 1879.

211,425—SULKY PLOW—J. Price, San Leandro, Cal.

FOR THE WEEK ENGINO JANUARY 28TH, 1879.

211,714.—WINGMILL—J. R. Dixon, Fresno, Cal.
211,763.—SIGHT FOR FIRE-ARMS—W. Matthews, Camp Bidwell, Cal.
211,756.—MINING CAR TRUCR—W. McCaskell and A. J. Munchard, Virginia, Nev.
211,794—SHOE FASTENER—I. J. Saunders, Davisville, Cal.

FOR THE WEEK ENDINO FEBRUARY 4TH, 1879.

212,066.—RATCHET DRILL—J. C. Steber, S. F.
211,939.—AMALGAMATOR—W. S. Shotwell, S. F.
211,833.—ELECTRIC SIGNAL FIRE HOSE—J. Bucbtel, Portland, Ogn.
211,999.—SUSPENGERS—H. M. Heinemann, S. F.
212,037.—MOTOR ENGINE—E. J. Molera and J. C. Cebrian, S. F.
212,038.—MOTOR—E. J. Molera and J. C. Cebrian, S. F.
212,039.—FLUIG MOTOR—E. J. Molera and J. C. Cebrian, S. F.
212,040.—REGULATOR FOR ELECTRIC LIGHTS—E. J. Molera and J. C. Cebrian, S. F.
211,936.—WINDING ATTACHMENTS FOR CLOCKS—S. Serighelli, S. F.
211,937.—EXPANSION PULLEY—S. Serigbelli, S. F.

FOR THE WEEK ENDING FEBRUARY 18TH, 1879.

212,347.—TOBACCO CUTTING MACHINE—L. Bauer and J. Seitz, S. F.
212,432.—RAILWAY CROSSING—W. B. Bernard, Sacramento, Cal., and J. D. Perkins, Elyria, Ohio.
212,493.—BILL FILE—E. H. Owen, Los Angeles, Cal.
212,331.—FLAVORING COMPOUND FOR TOBACCO—D. Sternberg, S. F.

FOR THE WEEK ENDING FEBRUARY 25TH, 1879.

212,591.—ENGINE—R. J. Cartmel, Santa Rosa, Cal.
212,664.—PULVERIZING MILL—J. T. Davis, S. F.
8,601.—FIRE-ARM—Re-issue—W. R. Finch, Eureka, Cal.
212,698.—STOVE—H. L. Howse, S. F.
212,739.—PACKING FOR STUFFING BOXES—G. C. Phillips, Silver City, Nev.
212,770 and 212,771.—CAR TRUCKS—George Vincent, Stockton, Cal.
212,775.—DERRICK-STAKE—R. P. Williams, Alameda, Cal.
212,780.—PADLOCK—N. A. Young, Healdsburg, Cal.

Notices of Recent Patents.

Among the patente recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

WAOON BRAKE.—J. F. Ditsworth, Austin, Lander Co., Nev. Dated, March 18th. This improved wagon brake consists in attaching to the rod connecting the brake bar with the roller, a case containing a spiral spring, through which the connecting rod passes. A nut on the rod under the case bears against the spring, when the brake is thrown on, so that in case a wheel is not perfectly round and the high place on the wheel etrikes the brake shoe when the brake is on tight, there is no danger of breaking the rods or of locking the wheel in one place so as to wear out the tire at one point. Suitable nute are placed in the connecting rod for regulating the tension of the spring, and also for preventing the rod coming too far back in case the spring ie hroken or hecomes too loose. With an ordinary hrake, the bar is connected to the roller by a solid connecting rod running to the short arm iu tbe roller. In case the wheels are not perfectly round when the brake is on tight and the high place in the wheel etrikee the block, the wheel will etop rotating and the part of the tire on the ground will be subjected to unnecessary wear. The tire will, therefore, soon become worn through at that point. Again when the wheel strikes the brake in the high place, it causes a jar on the brake frequently causing the hrake to give way. Very many of the accidents from brakes giving way have been occasioned by this defect. With this improved brake, when the high place in the wheel strikes the brake blocks, the spring in the case attached to the brake bar will give enough to allow the high place to pase the blocks without causing the wheel to drag, saving the tires from wear and causing no jar to the brake rods. When the brake is suddenly thrown on, and while its action is just as effective, it comes up with an easy motion and no jar. This method of connecting the brake bar with the levers tends also to keep the wheele round, as wherever there is a tendency to hulge, there a greater pressure is exerted. The spring being enclosed in a ehell is out of the way of the duet and dirt, but is easily accessible for repair or replacement, by separating the two sides of the ehell.

CARRIAOE SPRING.—Orrin S. Carvill. Dated March 18th. This invention relates to a novel improvement in the construction of springs and gear for carriagee and other vehiclee, and it consists mainly in the combination with the wooden side bars of a huggy of a central longitudinal eupplemental steel spring, so arranged and connectcd with the side bars that it will take a considerable portion of the strain when a heavy load is brought upon it, and by its assistauce to the wooden side bare greatly adds to the elasticity of the buggy. It further consists in the employment of a peculiar clip by which the side bars are attached to the holster and the rear axle bed, and by which they have a free and independent motion upon their points of attachment, and the axle bed or bolster will not be rocked back and forward by the vertical movements of the side hars and epring.

News in Brief.

HOSTILITIES are pending between Chile and Peru.

EBERHARD FABER, the great lead-pencil man, is dead.

ALSACE and Lorraine are to have a special cabinet.

THE work of rebuilding Reno is progressing rapidly.

TWENTY THOUSAND Russiane are moving into Turkistan.

IRON is to be supplanted by steel in the building of ships.

MERCED COUNTY is alive with vigorous young echool marms.

RAILROAD communication has been reopened above Maryeville.

SPANISH public opinion is unfavorable to the new Ministry.

LOUISVILLE is among the cities that are financially swamped.

THERE is a widely-spreading republican element in Brazil.

THE Russian police continue to make arreets for secret printing.

A PRAIRIE fire near Abilene, Kansas, nearly destroyed tbat town.

A HEBREW western colonization scheme is active in New York.

TELEPHONES are heing introduced into almost every town in Oregon.

FIVE Chinamen have been killed by Sheephead Indians iu Utah.

A DOZEN vessels will go north thie epring in the codfishing business.

THE reduction of the wages of laborers in England is very general.

THE new Constitution will technically relieve Chinamen from poll-tax.

SUTRO has at last effected a compromise with the Comstock companies.

BULLION continues to flow into Carson, Nev., from the eouthern country.

THE Western Electric Light Co. are running their elevators by electricity.

TWENTY-FIVE families of Mennonitee in Manitoba cultivate 10,400 acres.

A LOT of catfish have been put in Napa river some distance above tide water.

IT is estimated that there are at least 800 Chinese in and around Red Bluff.

THE Government is about to issue ten-dollar four per cent. treasury certificates.

THE growing crops in Washington Territory look finely, with no chance of failure.

AN excursion from the East to meet Gen. Grant on his arrival here ie talked of.

Two men were killed in a Pennsylvania coal mine, recently, by the fall of roof rock.

THE Southern Pacific railroad ie boring artesian wells in the California desert.

THE tramp who outraged Mrs. Truesdel at Newport, Ky., was lynched by a mob..

THERE is every indication of the speedy evacuation of Bulgaria by the Russians.

THE Canadian government favors reciprocity of tariff and trade with the United States.

TRACK laying has been begun on the eouthern extension of the Atchieon, Topeka and Santa Fe.

THE government of Mexico has definitely decided to hold an International exhibition in 1880.

ALLENTOWN, Penn., hae had a shower of sulphur, it lying in eome placee over half an inch deep.

ORVILLE GRANT, brother of the General, is in Washington, partially ineane, and in a pitiful condition.

ON the Northern Pacific railroad, between Kalama and Tacoma, there were recently 13 land elides.

THE Domiuion Parliament is inqniring into the matter of the boundary between Alaska and British Columbia.

THE ground was found to be frozen to the depth of three and a half feet in a New Haven street last week.

The "Little Wonder" Self-Calculating Sample and Button Weigher.

EDITORS PRESS:—Please allow me epace for answering numerous inquiries from your readers as to the general advantages and appliances of the above, recently patented apparatus.

1. It is more especially intended for those who can aesay by the blow-pipe, being surpassingly delicate in action and very portable, as well as self-calculating for dollars per ton on gold and silver, and percentage of lead, or other base metals.

2. It may be used for buttons from "furnace aesays," either by its self-calculation, or by ordinary eystems of weights.

3. It must supersede all other weighers for explorers and hlow-pipists, as it is not only cheaper but much more eusceptible, readily used, and portable.

4. It is explained on its face, and those who cannot even read figures may value with it.

5. To my past pupils I may eay, that they and all other blow-pipists are laboring under difficulties in weighing which this will lessen, to an almost incredible degree.

6. Its cost is only $25, including two weighere with weighte, and all other necessary tools.

J. S. PHILLIPS.

SPAIN boasts of 92 Dukee, 866 Marquises, 632 Counts, 92 Viscounts, and 98 Barons, besides 44 ennohled foreigners.

THE German Tariff Commiseion hae determined to shut out of the Empire American cattle and British coal.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and tbe Pavlliou performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical aud telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., March 19, 1878.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3
Horse Shoes, keg	5 00 @— —½
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, March 19, 3 P. M.

SILVER, 1½@2. GOLD in New York, par.
GOLD BARS, 890@910. SILVER BARS, 8@20 ₩ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₩ dollar; Mexican dollars, 87½@89.
LONDON Consols, 96 5-16; Bonds, 103.
QUICKSILVER in S. F., by the flask, ₩ lb, 40@41c.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE .... Manager.
F. LYSTER .... Acting Manager.
CHAS. H. GOODWIN .... Treasurer.
J. P. CHAPMAN .... Assistant Treasurer.

ROSE EYTINGE.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE .... Lessee and Manager

HYERS SISTERS.

Open every evening and Saturday Matinee.

CALIFORNIA THEATER.

BARTON & LAWLOR .... Manager.
BARTON HILL .... Acting Manager.

BUFFALO BILL.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

Mining and Other Companies.

Persons interested in incorporated sharee will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Griffith Consolidated Mill and Mining

Company,—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 21st day of January, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
J H Brewer	36	50	$ 10 00
Warren Bryant	not issued	2100	420 00
Alexander Bryant	37	1125	225 00
Alexander Bryant	38	1125	225 00
L H Foote	39	100	20 00
L G Harvey, Trustee	35	4000	800 00
J H Roberts	19	500	100 00
J H Roberts	20	500	100 00
J H Roberts	21	500	100 00
J H Roberts	22	500	100 00
J H Roberts	26	500	100 00
J H Roberts	27	500	100 00
J H Roberts	28	500	100 00
J H Roberts	29	500	100 00
J H Roberts	30	500	100 00
J H Roberts	31	500	100 00
J H Roberts	32	500	100 00
J H Roberts	33	500	100 00
J H Roberts	34	500	100 00
J H Roberts	280	200	40 00
J H Roberts	281	200	40 00
J H Roberts	282	200	40 00
J H Roberts	283	200	40 00
J H Roberts	284	200	40 00
John G Vantino	not issued	4500	900 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, No. 330 Pine street, Room 4S, San Francisco, California, on the 26th day of March, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

G. M. CONDEE, Secretary.

Office, Room 4S, No. 330 Pine St., San Francisco, Cal.

Office Wide Awake Prospecting and Mining

Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 8) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2, No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board of Directors. C. HILDEBRANDT, Secretary.

POSTPONEMENT.—The delinquent day of the above named assessment has been postponed until Tuesday, the First day of April, 1879, and the day of sale until Thursday, the First day of May, 1879, at the same hour and place. By order of the Board of Directors.

C. HILDEBRANDT, Secretary.

San Francisco, March 1st, 1879.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	33	700	35 00
Edwards, J E	39	700	35 00
Gautier, Gustave	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Sanford, E P	3	500	25 00
Sanford, E P	22	1000	50 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

The California and Oregon Land Company.

—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the First day of March, A. D., 1879, an assessment (No. 2) of Forty Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of April, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Saturday, the Tenth day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco, California.

Union Stone Company.—The Regular

Annual meeting of the Union Stone Company of California for an election of a Board of Directors (to act as Trustees) to serve the Company for the ensuing year, and for such other business as may properly come before the meeting, will be held at the office of the Secretary of the Company at 237 First Street, San Francisco, California, on Tuesday, April 8th, 1879, at 11 o'clock A. M.

R. F. KNOX, Secretary.

San Francisco, March 20th, 1879.

Mill and Mining Machinery Of All Kinds For Sale by Berry & Place

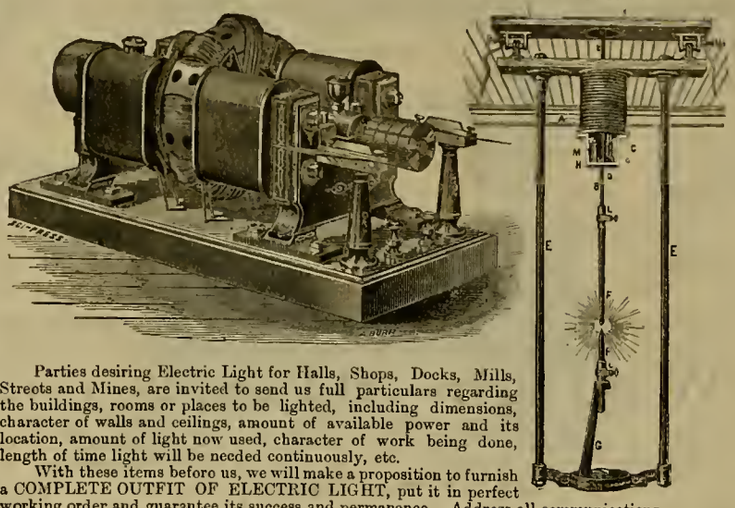
At the Old Stand, Market, head of Front Street, S. F.

ELECTRIC LIGHT.

BRUSH PATENT.

The Best, Cheapest, Cleanest, and Most Powerful Light in the World.

In daily use at the Palace Hotel and the Union Iron Works, S. F.



Parties desiring Electric Light for Halls, Shops, Docks, Mills, Streets and Mines, are invited to send us full particulars regarding the buildings, rooms or places to be lighted, including dimensions, character of walls and ceilings, amount of available power and its location, amount of light now used, character of work being done, length of time light will be needed continuously, etc.

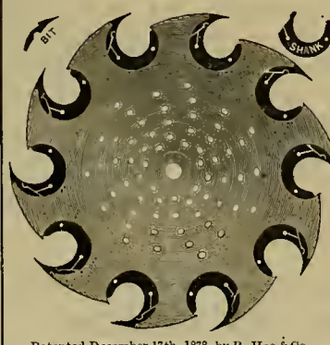
With these items before us, we will make a proposition to furnish a COMPLETE OUTFIT OF ELECTRIC LIGHT, put it in perfect working order and guarantee its success and permanence. Address all communications,

S. F. TELEGRAPH SUPPLY CO.,

WM. KERR, President,

San Francisco, Cal.

THE VENTILATED (PERFORATED) SAW.



Patented December 17th, 1878, by R. Hoe & Co.

The diameter of the body of the plate in this cut is contracted, in order to show the teeth more plainly.

Our Chisel-tooth Saw has already taken the lead, and is rapidly superseding all others, and now we have the pleasure of calling your attention to still another IMPROVEMENT which we are placing on them without additional charge.

The ventilators (holes) cause the plate to shrink equally in the process of hardening, thereby avoiding the injury resulting from warping and subsequent trueing with the hammer, to which solid plates are subjected. They also take the chip out of the cut, and the circulating of the air through them keeps the saw cool.

Office of Hanson, Ackerson & Co.,
Manufacturers and Dealers in Lumber, Etc.,
Tacoma, Wash. Ter., Feb. 14, 1873.

Messrs. Tatum & Bowen, 3 Fremont St., San Francisco.

GENTLEMEN:—The 60-inch Perforated Chisel-Tooth Saw purchased from you in December last has been in constant use since received, doing its work faithfully, and we consider it the best saw in our mill. SLOWER TO HEAT than solid saws, standing up to its work in all kinds of timber, and good for NINETY THOUSAND FEET A DAY. We take great pleasure in recommending your Perforated Saws for mills engaged in cutting large timber.

Yours Respectfully, HANSON, ACK. IKSON & Co.

Sharp, round and ready to run the moment received.

Can be kept so without expenditure of skill or time.

When dull, a boy in five minutes can insert a set of sharp teeth in largest saw, without removing from mandrel.

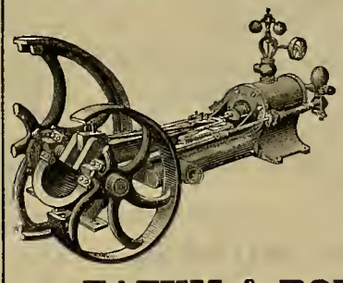
The teeth, being firmly held, without rivets, screws, or keys, will stand the heaviest feed, and cut the least kerf.

Teeth only 3½ CENTS each.

Address TATUM & BOWEN, Sole Agents,

SEND FOR CATALOGUE. No. 3 Fremont Street, San Francisco.

THE BALL PATENT VALVE ENGINE.



The valve is in two parts and connected by circular sleeves which allow each part to be adjusted by steam pressure to its own face and to follow the wear.

The sleeves have rings which prevent the steam from escaping between them. The pistou has two full sets of Steam Packing Rings, each set being composed of six pieces. They take care of themselves and need no looking after.

The rim of the balance wheel is in three pieces, the object being to have a light or heavy wheel, a very desirable feature in boring oil or artesian wells. Can be attached to boiler or bed.

It is cheaper, and warranted to run longer without attention or repair than any engine in use.

Price, cylinder 9x12, with Heater, Governor, Pump, Bolts and everything complete, $500. Weight, 3,000 pounds. Duplicates of all parts kept on hand. Engines No. 952 and No. 962 on hand in San Francisco.

Reversible engines of same style—same price.

300 Revolutions, 40 horse-power, price, $500.

High Speed System, dispensing with large Pulleys and Heavy Gearing.

TATUM & BOWEN, Sole Agents,

No. 3 Fremont Street, Corner Market, - - San Francisco, Cal.

All size Boilers on hand. Send for Catalogues of our celebrated Ventilated Chisel Tooth Saw, Saw Mill Machinery, Albany Lubricating Compound, Cylinder Oil, HOE & CO.'S PRINTING PRESSES, Etc.

Boswell Pure Air Heater Company

OF CALIFORNIA.

Eugene L. Sullivan, Pres't. T. C. Winchell, Vice-Pres't. S. R. Lippincott, Sec'y.

Authorized Capital, $100,000. Cash Capital, paid up, $32,000.

Manufacture and have for sale any size or capacity

Boswell's Patent Combined Cooker, Heater and Drier.

ALSO, BOSWELL'S COMMERCIAL FRUIT DRIER.

ALSO, BOSWELL'S VENTILATING HEATER.

Office, 606 Montgomery Street, San Francisco, Cal.

Engraving done at this office. | Dewey & Co {202 Sansome St.} Patent Ag'ts

A. S. HALLIDIE.

Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

Send for a Circular.

A. S. HALLIDIE,

Office, No. 6 California St., San Francisco

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.

Hooker's Patent Celebrated

STEAM PUMP

The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manfuactory. 17 & 19 Fremont St., S. F.

Mine Wanted.

The advertiser is prepared to purchase a *good* California Gold mine; gravel or quartz. Must be in a condition to be examined and prospected.

Send full particulars, description, location and price to "MINER," care of Chas. G. Yale, Esq., editor of the MINING AND SCIENTIFIC PRESS, San Francisco, Cal.

Picturesque Arizona. By E. CONKLIN, Representative of the National Associated Press, and artist and correspondent of Frank Leslie's publications. Being the result of Travels and Observations in Arizona during the fall and winter of 1877. Fully illustrated. Sent by mail, post-paid, for $2. Address DEWEY & CO., 202 Sansome Street, S. F.

FOR SALE.—16-horse Engine 8-inch by 16-inch bore, with 20-horse boiler. Hot water pump. Everything necessary to set it to running. Price, $1,000. At Jackson's Agricultural Machine Works, S. E. corner 6th and Bluxome Sts., San Francisco.

Iron and Machine Works.

THOS. PENDEROAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS

MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

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Golden State & Miners Iron Works,

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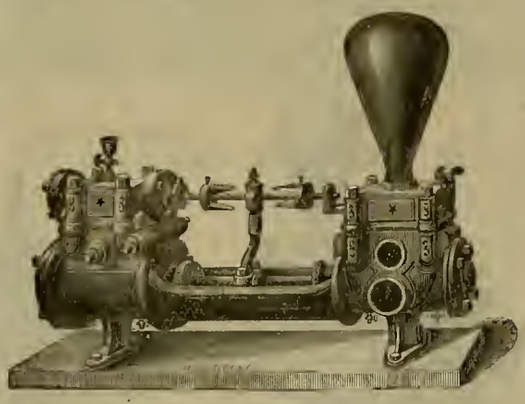

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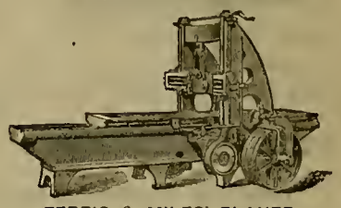

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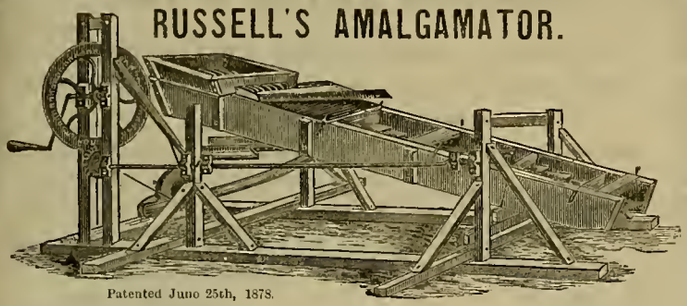

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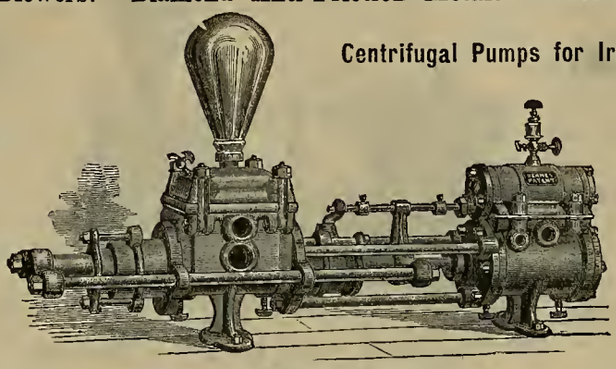

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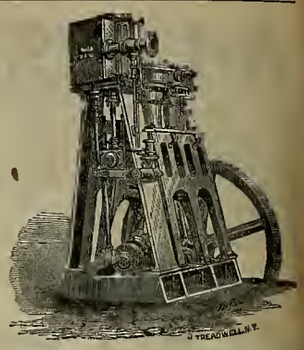

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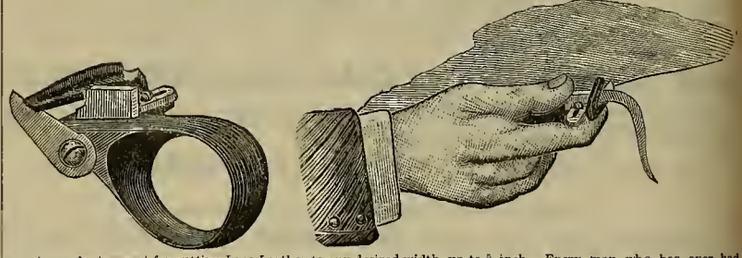

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MARCH 29, 1879.

VOLUME XXXVIII Number 13.

Michel's Improved Amalgamator.

We illustrate herewith an improved amalgamating pan, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Justin Michel, of Nevada city, Cal. The invention consists in a pan provided with a bottom gradually descending from the center to the circumference, and provided with a flaring rim, which merges into an outwardly curved projection or rim, whereby a more rapid feed and circulation are kept up, the form of the bottom always starting the current at once outwardly, and aiding the centrifugal action.

A represents the amalgamating pan with enclosed sides, *X*, mounted on the usual standards, and having the pulley, *B*, shaft, *C*, gear, *D*, and pinion, *E*, as shown, for directing the power to the operating parts.

In the center of the pan is a hollow standard, *E*, which projects upwardly above the top of the pan and inside of which plays the vertical shaft, *F*, having the pinion, *E*, at its lower end engaging with the gear, *D*. A collar, *G*, is formed on this vertical shaft, which revolves on top of the hollow standard, thus forming a bearing for said shaft. A hollow cylinder or sleeve, *H*, slips down over the shaft, *F*, and standard, *E*. This sleeve has an extension, *I*, made somewhat smaller than the sleeve, and inside of which the upper end of the shaft projects, the sleeve itself enclosing the standard, *E*.

At the point where the sleeve and extension join, an offset is formed as shown, the sleeve being larger in diameter than the extension, and at the same time thicker. Feed holes, *J*, are bored or formed vertically down through the sleeve, *H*, commnnicating with the center of the pan, as shown. Several of these feed holes are formed in the sleeve, and the pulp is fed to the pan through them.

An upwardly extending rim or flange, *K*, is formed on or attached to the upper end of the sleeve, *H*, and answers as a sort of a hopper above the feed holes. The ore fed into this ring or hopper, passes down through the feed tubes to the center of the pan, so that a sort of funnel is formed for the continuous introduction of ore and water. To the lower part of the sleeve, *H*, are attached the muller rings or frames, *L*, to which are secured the shoes, *M*, by dovetail mortise and tenon.

The dies, *Q*, are so placed in the bottom of the pan as to leave a groove, *N*, around the center of the pan, into which quicksilver is placed. The lower part of the sleeve is cut away above this groove, *N*, as shown at *O*, so that amalgamation may be accomplished by centripetal injection, the centripetal force being induced by means of the curved rim, *P*, as hereinafter described.

The dies, *Q*, are so formed as to leave a groove, *R*, around the pan, into which quicksilver is introduced for amalgamation by centrifugal injection, the centrifugal force being induced hy the rotation of the arms and shoes attached to the sleeve.

On the upper sides of the arms or frames, *L*, are placed adjustable agitators, *T*, which, hy their peculiar shape, regulate the centrifugal motion of the water. These agitators have a set screw or common screw, *S*, hy which they are attached to the arms or frame, and which will hold them in any desired angle or position.

The pan has an inwardly-projectiug curved rim, *P*, which tends to direct the heavier particles of ore to the center. The lighter particles flow over the edge of this rim, and fall into the channeled plate or conveyor, *T'*, passing from this through the spout, *U*, to the settlers, or wherever it is desired to lead them.

A feather, *V*, is formed in the upper end of the vertical shaft, *F*, which engages with a longitudinal groove formed in the extension, *I*, of the sleeve, *H*, so that when the shaft, *F*, is set in motion, this motion is imparted to the sleeve carrying the arms and shoes.

In order to be able to regulate the hight of the shoes and dies, a set screw, *V*, passes down through the upper end of the extension, *I*, and its lower end rests on the top of the shaft, *F*, a suitable hearing being formed at that point. As this set screw is screwed through this extension, hy turning it the extension may be raised or lowered, thus raising or lowering the sleeve carrying the arms or shoes. A discharge pipe, *W*, on the lower side of the pan, is used for drawing off the contents when it is desired to clean up the pan.

It will be seen from the foregoing description that contiuuous feed and discharge may be maintained in this improved pan. The pulp may be lead by appropriate means into the ring or receiver, *K*, and is directed by the holes in the shell down to the bottom of the pan, where it falls into the quicksilver in the central groove, *N*. The natural centrifugal motion imparted to the mass of pulp by the motion of the shoes and agitators is such as to direct it to the outer edge of the pan, where it again mingles with the quicksilver in the groove or channel, *R*. The pulp is then directed by the inclined or beveled edge of the pan toward the upper edge of the pan, where it strikes the inwardly-projecting curved rim, *P*, which throws the heavier particles of pulp by centrifugal action toward the central groove, *N*, through the opening, *O*, where they may again mingle with the quicksilver. The lighter material may then pass off with the water, which is continuously overflowing all around the pan. In this way the pan is kept free by the ore passing off in the muddy water after it is ground sufficiently fine to float, and the ore is not ground and re-ground as in other pans.

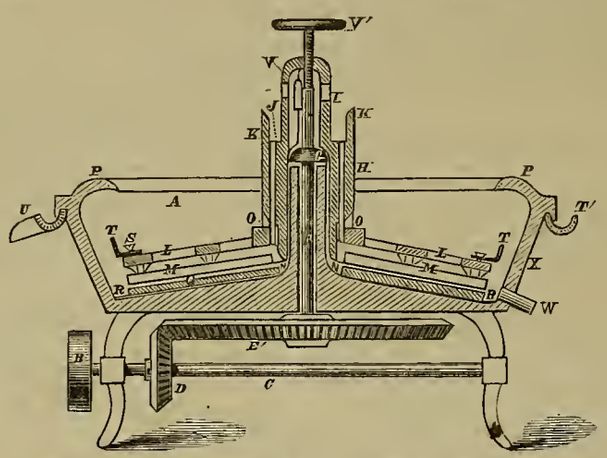

FIG. 1. MICHEL'S IMPROVED AMALGAMATING PAN.

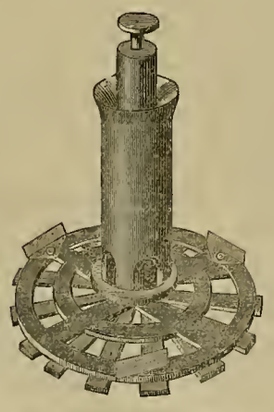

Fig. 2. Arrangement of Muller.

The grooves, *N* and *R*, are formed hy the dies or false hottoms as shown in Fig. 3, which are of the same dimensions as the shoes or grinders, and which do not cover the entire surface of the hottom, hut leave the channel around the outer edge and center of the pan as described. These grooves are filled with quicksilver, where it is held in one hody, instead of being ground with the pulp, as is the case with many ordinary pans. The quicksilver not being ground is not "floured" into fine particles which will pase off and be lost.

As a uniform motion of the water and pulp, while the pan is in operation is desirable, the adjustable agitators are added. When the shoes are new the desired velocity is obtained without the use of agitators; hut as the former wesr down, the position of the latter is changed so as to keep the motion of the water and pulp the same. Those desiring further particulars concerning the new pan may address Mr. Michel, the inventor, at the address before given.

AN APPOINTMENT FIT TO BE MADE.—Clarence King, on nomination of Presideut Hayes, has been confirmed by the Senate Director of the United States Geological Survey. This (and we say it without any purpose to disparage the claims of others to the position, if such were made,) is the right man in the right place. The former two surveys, the one under Dr. Hayden, and the other under Lieutenant Wheeler, having been consolidated, no more competent or deserving man could have been chosen for superintending the whole work than Mr. King. Dr. Hayden was, perhaps, equally well qualified for the place, but having opposed the consolidation, his aspiration to the position of General Director almost necessarily met with disappointment when this opposition failed of its object.

CALL FOR MORE METEOROLOGY.—The New York *Herald* calls for more frequent meteorological observations by the government for the protection of commerce and agriculture east and west. Instead of one set of observations limited to this continent, they should reach Europe and Asia. For an international system worthy of great countries we should have a daily exchange of observations through several centers—Washington, San Francisco, London or Paris, Berlin or Vienna, St. Petershurg, Rome, Constantinople or Cairo, Calcutta and Yokohama.

Fig. 3. Dies in Michel's Pan.

THE first importation of American meats into Germany some years ago resulted in failure. The last season 35,000,000 pounds were imported there of heef of the best quality, sown tightly in thick canvas,

Artificial Crystals of Gold.

We have received from Prof. Albert Chester, of Hamilton College, New York, two microscopic slides containing artificial crystals of gold, one prepared hy the battery process from a solution of the chloride, the other from an amalgam, the mecury of which is driven off by digesting with nitric acid instead of by heat. As is known to all experimenters, the form of the artificial crystals from a solution of the chloride, is a most beautiful and delicate feather or fern-leaf form, but those sent by Prof. Chester are the handsomest we have seen. He has been making microscopic observations of the points of difference hetween the natural and artificially produced crystals of gold, the results of which have been communicated to Eastern scientific journals. Briefly, it may be remarked that the crystalline forms observed upon hars of pure gold cast for dental use, are generally tringular and occasionally show several faces of the octohedron, but are never hexagonal, as is frequently the case with natural crystals. Nor do these bare show the dendritic forms so common in nature, and now easily obtained artificially by deposition from a solution.

Concerning the feather or arborescent forms obtained by the battery process, Prof. Chester has published interesting observations showing that the angle which the side ribs make with the mid-rih, is unvariably one of 60°, making an angle of 120° between the two sets of side ribs. Prof. Chester notes that it is very difficult to measure the angles in the case of these artificial crystals, because the mid-rib is usually more or less curved and the whole form presents great irregularities. However, he sought to prove the constancy of the 120° angle, hetween the two side ribs, by a long series of measurements. A series of 50 measurements of crystals taken at random, gave an average of 119° 85′, which is certainly a close approximation. On these crystals Prof. Chester also notes the extreme flatness of the feather-formed crystals, one of them being fully studied under a power of 300 diameters without a change of focus. This is unusual in crystals of isometric forms.

The second slide which we received shows the octohedrons obtained from an amalgam allowed to form on a surface of pure gold. If the amalgam is treated by heat, the mercury is driven off and the surface left amorphous or covered with angular depressions. Distinct but minute crystals of gold amalgam may be easily ohtained if the mercury is dissolved out with dilute nitric acid. A series of measurements on a numher of these crystals proves them to belong to the hexagonal system. The average of 48 measurements of the prismatic angle is 119° 53′, the six angles of the most perfect one measuring as follows: 120° 30′; 121° 6′; 119 12′; 119° 6′, 120° 36′ and 120° 12′. These crystals are often imperfect. The pyramidal planes are sometimes entirely wanting, the crystal having only a basal termination. The base is often hollow, and in one case was entirely gone. In the *American Journal of Microscopy* for January, 1879, Prof. Chester gives fuller detaile concerning the characteristics of these crystale and the methods hy which they are best attained. The study is of much interest to students of crystallography.

THE VISALIA DELTA is now published by Walker & Barnes, who recently purchased the office of E. M. Dewey. Mr. Dewey has spent some 10 years in active service as editor and publisher of the *Delta*, and succeeded boldly and independently in making it one of the most successful local weeklies in the State. We are fully acquainted with Mr. Walker, a sincere and reliable man, and efficient job printer, and understand that himself and partner are well calculated to maintain the efficiency and increase the popularity of the establishment. The office is one of the hest equipped in the interior of California.

THE coal industry of Pennsylvania has reached enormous proportions, the annual product heing valued at $50,000,000. The first coal mined, amounting to a few hundred tons, was sold in Philadelphia in 1813 for $21 a ton.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Nevada's Wealth.

A Great Salt Marsh.

EDITORS PRESS:—I did not complete my intended descriptions of the various matters of interest in my former letter, for fear of trespassing upon your columns, and yet your paper is devoted to the diffusion of knowledge and the publication of facts that pertain to the benefit of the whole country; and as I found the SCIENTIFIC PRESS in nearly every cabin I visited in the mines, I shall presume upon its columns to give the people outside of Nevada the facts concerning the dormant wealth that lies hidden amid the mountain ranges and marshes and valleys of that young State.

Among our explorations of the great salt marshes, one very remarkable curiosity attracted my attention, and that was the number of fresh water springs flowing up and spreading out over the surrounding ground, and in close proximity to the salt springs and not more than 100 feet from the large soda spring. The opening in the ground was circular in form and about two feet in diameter. We could look down into the clear, sparkling water for several feet and it apparently had no bottom. Nature seems to have been very lavish in her experiments at this point in regard to springs, for there certainly is not another such a combination of waters impregnated with so great a variety of mineral salts on the face of the globe. The terminal points seem to have centered in this basin from sources that are miles away, and horn in their subterrancan passages, each and every one keeping separate and distinct until they unite and mingle upon the surface, where each forms its own peculiar deposit.

The fresh water springs contained considerable carbonate of lime ($CaCo^2$), but was exceedingly fresh and pure and cold; and at no distant day will this spot be visited by the most scientific as an anomaly in nature worthy of their deepest thought and most vigorous research.

About three miles distant in the same valley, and quietly sleeping beneath the shadow of a lofty mountain, can he seen the famous hot springs, where the miners from the adjacent mining camps would often gather to boil their eggs (if they had any) or make themselves a hot cup of tea. Some one more enterprising than the rest, and having an eye to his sanitary conditiou, has erected a board shanty over one and arranged a sluice way for bathing purposes; and when the population of the State, or of this surrounding country especially, becomes sufficiently numerous, this will be a grand resort for bathing purposes. Then do not consider me extravagant in my expressions of wonder at this remarkable group of springs, as there are soda springs, horax springs, soft-water springs, limestone springs, salt springs, sulphur springs, iron springs, magnesia springs, bitter springs, and last, but not least, iodine springs—all within the radius of a few miles.

As there are over 2,000 springs, and each spring capable of producing from one to five tons each per day, it is easy to calculate the magnitudo of the amount of salt that this source could supply; and putting the gross yield at 3,000 tons per day (a low average), and the price at $20 per ton, delivered in your city, would make an aggregate of $60,000 per day, or $18,000,000 per annum for 300 working days. And as the flow of brine is continuous, what an immense source of wealth this will be to the State, and as it is an amount over and above consumption, the effect upon the general prosperity of the State would he felt in every avenue of its prosperity. The only drawback at present is the want of a more expeditious way of getting it to market, and as a narrow-gauge railroad could he built from Wadsworth to the springs, a distance of 110 miles, for $600,000, it certainly cannot remain long in this unprofitable condition. Some of our enterprising capitalists will certainly step in and build a road, that they are assured will have 3,000 tons of freight one way and a large amount the other way.

I passed over the entire distance from Wadsworth to the springs, and can safely say that $300 per mile will do the grading, and the heaviest up-grade would not exceed 20 feet to the mile.

The investment would double itself every year after paying for running expenses, wear and tear, etc. I have not seen an enterprise on this coast that offers such an enormous remuneration for the investment.

The following facts have been collated from reliable sources upon the construction of a narrow-gauge railroad, and can he relied upon as coming within the range of the probable expense:

Road bed—54 tons 35-lb rails at $30	$1,620
Chains and spikes, per mile	210
Cross ties, per mile	800
Grading and track laying	1,000
Culverts and bridges	100
Superstructure	$3,730
$3,730 per mile, 110 miles	$410,300
8 engines, $7,500	60,000
6 passenger cars, $1,600	9,600
2 baggage cars, $1,200	2,400
150 freight cars, $800	124,000
Cost of operating	$606,300

The several narrow-gauge railroads of this country have demonstrated that they can he run for 30 cents per mile per train, which would make this exhibit:

110 miles—one train each way making 220 miles at 30 cents	$ 66.00
Wear and tear, 2½%	35.00
Interest on $600,000 at 1%	233.30
Cost per day	$334.30
Receipt from 3,000 tons of salt one way, at $2.50 per ton	$7,500.00
50 tons out-bound at $10	500.00
Passengers and miscellaneous	250.00
	$8,250.00
$8,250.00 per day less $334.30=	$7,915.70

Seven thousand nine hundred and fifteen dollars and seventy cents per day, for 300 days, would give us a surplus upon the investment of $2,374,710, or four times the coast of the road every year.

I will add as a contingent, to cover any discrepancy, $100,000 for additional motive power and cars, and then there is no railroad project on the continent that will pay so large a dividend as this little road. And yet I have not mentioned the thousands of tone of ore that would he shipped to your city for treatment, if it could he got there at a reasonable cost. I saw in one dump over 10,000 tone of ore, that will pay, at least, $100 per ton, that would he shipped at once if there were railroad facilities; and ledges varying from 10 to 40 feet, that will supply thousands of tons more the moment transportation facilities were completed, if they did not conclude to erect mills.

The scarcity of water is the great drawback to the erection of mills at the mines, and as wagon transportation is so expensive through those barren sand wastes, owners of mines would at once avail themselves of railroad transportation, and your city would reap a harvest in the interest that would at once spring up in the establishment of large metallurgical works, and the State would be largely benefited by the further development of these vast bodies of mineral deposits.

It has been demonstrated that no link in the whole chain of general prosperity brings such certain and lasting benefits as the iron rails of railroads, and there is no place in the country where this accomplishment would bring a more certain reward than a railroad connecting Esmeralda county, Nevada, with the Central Pacific, at some convenient point of connection.

JNO.

Steam Threshing Engineers.

EDITORS PRESS:—By giving some attention to the steam boiler question, particularly boilers used for threshing purposes, you will be instrumental in saving many valuable lives. There is not a season passes but what there are three or four, or more, explosions, and from six to a dozen lives lost, and the threshing season only lasts from three to four months on the average. Is this sacrifice of life and property necessary? It appears to me that two-thirds, if not three-fourths of these accidents could he avoided by having careful and experienced hands.

Examine those explosions that happened last summer. One man who knew comparatively nothing of an engine, exploded his, killing himself and scalding his father. Another young man was so flustrated by the water-glass breaking that he was incapacitated to run, and the result was an explosion; probably as soon as the water got below the crown sheet. This young man was a practical illustration of theory without practice, and paid his life for the experience, besides scalding others. He had served an apprenticeship, but be it understood that all machinists are not engineers. A third case was an Ames straw-burning boiler. The number of lives lost I am not aware of, though there were more wounded than in either of the other cases. When the first Ames straw burners were built, the main flue was of too light iron and not braced. The heads had two three-quarter braces or etays eight feet long. They would have been safe at from 50 to 60 pounds of steam, but were run at from 110 to 135 and 140 pounds. Sane men could not expect them to last more than two or three seasons without bursting under such a pressure.

The sad affair at Stockton was doubtless the result of carelessness. A careful man would know at what pressure his safety valve would blow off at, and keep his steam just so that it would not blow off; especially if his gauge was out of order. The blow off point should not he more than five or ten pounds above what you run at; and running over 100 pounds is dangerous, and straining to most boilers.

To show how a careful engineer is rated by some less scrupulous in the business, I will cite a case that happened in Sacramento county last summer. The engine under consideration was a No. 4 Ames straw burner, return flue. The end of the flue was badly burned and rusted; the rivets holding it to the flue sheet nearly burned off on the sides, and the tubes almost constantly leaking. When four cracks in the end of the flue and flange of the flue sheet appeared in one week, two in one day, the engineer gave notice that he would quit, as soon as a substitute could be found, if it was not repaired. He was discharged; the man taking his place declaring that there was no danger so long as there was plenty of water. They ran one and a half days, when temporary repairs were made. The boiler is now receiving thorough repairs, to the credit of the owners.

A locomotive engineer is proven before he gets an engine, and a steam-boat engineer has to get a certificate; why should others be exempt? The pay is generally sufficient to secure competent hands, if due caution is used in hiring them. Cities drive powder magazines to a distance, but allow boys and other irresponsible persons to have charge of boilers in their midst, thereby jeopardizing life and property by simple negligence.

Farmers, see that the machine that threshes for you has a competent and careful engineer, for you are liable to your neighbors for damages if a fire, through carelessness, damaging them starts on your place. Blow ups make fires.

A READER.

Routiers, Sacramento Co.

The California Game Laws.

SECTION 1.—Section six hundred and twenty-six of the Penal Code is hereby amended so as to read as follows:

Section 626.—Every person who, in the counties of San Bernardino or Los Angeles, between the first day of April of any year and the first day of August of the same year, or who, in any other of the counties of this State, except the counties of Lassen, Plumas and Sierra, between the fifteenth day of March and the fifteenth day of September in each year, hunts, pursues, takes, kills, or destroys quail, partridge, or grouse, mallard, wood, or summer duck, red-head gadwell, or gray duck, or blue-winged teal, is guilty of a misdemeanor.

Every person who in the county of San Joaquin, between the first day of January and the first day of July, in each year, hunts, pursues, takes, kills or destroye doves, is guilty of misdemeanor.

Every person who, at any time, takes, gathers or destroys the eggs of any mallard, wood, or summer duck, red-head, teal, gadwell, or gray duck, or any other species of wild duck is guilty of a misdemeanor.

Every person who shall have any of the aforesaid game in his possession at a time when it is unlawful to kill the game, is guilty of misdemeanor.

SEC. 2. Section six hundred and twenty-eight of said Code is hereby amended so as to read as follows:

Section 628. Every person who, between the first day of November in each year and the first day of July of the following year, hunts, pursues, takes, kills or destroys any male deer or buck, shall be guilty of a misdemeanor.

Every person who shall, for the period of four years from and after the passage of this Act, pursue, hunt, take, kill or destroy any antelope, elk, or mountain sheep, or female deer or doe, shall be guilty of a misdemeanor.

Every person who, after the passage of this Act, shall kill any spotted fawn, shall he guilty of a misdemeanor.

Every person who, after the passage of this Act, shall take, kill or destroy any of the animals mentioned in this section, at any time, unless the carcass of such animal is used or preserved by the person slaying it, or is sold for food, is guilty of a misdemeanor.

SEC. 3. Section six hundred and thirty-three of said Code is hereby amended so as to read as follows:

Section 633. Every person who takes, catches, or kills any speckled trout, brook or salmon trout, or any variety of trout, between the first day of November and the first day of April in the following year, is guilty of a misdemeanor.

SEC. 4. Section six hundred and thirty-four of the Penal Code is hereby amended so as to read as follows:

Section 634. Every person who, between the first day of August and the fifteenth day of September of each year, takes or catches, buys, sells, or has in his possession any fresh salmon, is guilty of a misdemeanor.

Every person who shall set or draw, or shall assist it setting or drawing any net or seine for the purpose of taking salmon in any of the waters of this State, at any time between sunrise of each Saturday, at twelve o'clock noon of the following Sunday, is guilty of a misdemeanor.

Every person who, between the first day of April and the thirty-first day of December in each year, takes or catches, buys, sells, or has in his possession any fresh shad, is guilty of a misdemeanor.

Nothing in this chapter shall be so construed as to prohibit any person from catching fish with hook and line at any time in the tide waters of this State.

SEC. 5. Section six hundred and thirty-six of said Code is hereby amended so as to read as follows:

Section 636. Every person who shall set, use, or continue, or who shall assist in setting, using, or continuing any pound, weir, set net, trap or other fixed or permanent contrivance for catching fish in the waters of any of the creeks, rivers, or sloughs of this State, is guilty of a misdemeanor.

Every person who shall draw, or who shall assist in drawing, any net or seine for the purpose of taking fish in any of the waters of this State, the meshes of which are less than one and one-fourth inches in size, is guilty of a misdemeanor; *provided*, that nets with a mesh of a smaller size may be used in the catching of shrimps.

Every person who shall cast, extend, or set any seine or net of any kind for the catching of fish in any river, stream, or slough of this State, which shall extend more than one-third across the width of said river, stream, or slough, at the time and place of such fishing, is guilty of misdemeanor.

Every person who, by seine or other means, shall catch any fish so small as to be able to escape through a mesh of one and a half inch in size, or the young of fish of any species, but which, at the time of capture, are too small to be marketed, and who shall not return the same to the water, immediately and alive, or who shall sell, or offer for sale, any such fish, fresh or dried, is guilty of a misdemeanor.

Every person convicted of violation of any of the provisions of this chapter shall he punished by fine of not less than fifty dollars, and not more than three hundred dollars, or imprisonment in the county jail of the county where the offense was committed, for not less than thirty days nor more than six months, or by both such fine and imprisonment.

One-half of all money collected for fines for violation of the provisions of this chapter shall be paid to informers, and one-half to the District-Attorney of the county in which the cass is prosecuted. All other costs shall be a charge against the county in which the action is prosecuted. Nothing in the chapter shall he construed to prohibit the United States Fish Commissioners, or the Fish Commissionere of the State of California, from taking such fish as they shall deem necessary for the purpose of artificial hatching nor at any time. All nets, seines, fishing-tackle, boats, or other implements used in catching or taking fish in violation of the provisions of this chapter, shall he forfeited, and may be seized by the peace officer of the county, or assistant, or person acting under the authority of the Fish Commissioners, and may be by them destroyed, or may be sold at public auction by the party making such seizure, upon notice posted in said county for five days. The person making such seizure and sale shall be entitled to retain one-half of the proceeds of such sale, and the balance shall be paid into the school fund of the county, in case the seizure and sale is made by a peace officer thereof, or to the Fish Commissioners if made by a person appointed by them; *provided*, that all nets having meshes of less than one and a half inches in size, when seized under the provisions of this section, must he destroyed.

SEC. 6. The Act shall take effect and be in force from and after its passage.

Santa Clara County Game Regulations.

An Act having passed at the last session of the Legislature for the protection of fish and game in the State, which was injurious to the people of their county, the Supervisors, at the April session, in accordance with power conferred upon them by Section 1,046 of the Political Code, made the following regulations for the protection of game and fish in Santa Clara county, which differs materially from the dates in the last State enactment. It is made a misdemeanor to take, kill, or destroy quail, partridge, or grouse between the 15th of March and the 15th of September each year. Elk, deer, or antelope must not be taken or killed between the 1st of December and the 1st of July of each year. It is made a misdemeanor to take or catch trout between the 15th of October and the 1st of April; it is also made a misdemeanor to take, catch, or kill trout at any time by the use of nets, weir-baskets, traps, drags, or any explosive agent.

Immigrant Sleeping Cars.

At their shops at Sacramento the railroad company is at present engaged in fitting up 25 cars, which are to be used for the transportation of immigrants and emigrants to and from the East, and which are a great improvement on those at present in use. The new cars are being fitted with upper and lower berths, somewhat after the manner of cahoose cars. The upper berths swing freely on iron rods, and when not in use can he hung up on the roof of the car, where it is not in the way. The lower berths are formed from the seats, which are made up after the manner of the present sleepers, by turning down the backs, etc. Slats are then placed crosswise, and when laid out the berths are exceedingly neat and comfortable. This will he a great convenience to persons traveling third-class, as heretofore they have been compelled to sit up or make shift the best they could. The only difference between these remodeled cars and the present sleeper will he that the former will not he upholstered. Another benefit which the Company will derive from this improvement is that they will be enabled to carry more passengers in a car, from the fact that heretofore only one passenger could he placed in a seat, so that he could have an opportunity to lie down, but now the upper berths will make sleeping room for an extra number and more can be accommodated. It is a merciful act on the part of the Company, as heretofore the immigrants and emigrants have been very uncomfortable while traveling. Several of the altered cars are already completed. —*Sacramento Bee.*

HOW ARTIST'S CANVAS IS PREPARED.—The raw canvas must be stretched on a frame, wetted, and restretched if loosened by wetting, and coated with a mixture of equal parts of dry whiting and white lead, ground up with raw and boiled linseed oil, and laid on with a trowel like a plasterer's trowel, but longer and thinner in the blade. If the canvas shows through the first coat, a second and a third may be applied, the under coats being rubbed down with pumice stone. A little raw umber may be added if a stone-colored surface is preferred.

MECHANICAL PROGRESS.

Economy of Clothing Boilers.

The following ars the results of somo experiments conducted ssveral years ago, at the Newport iron works, Middlesborough-on-Tees, Eng., to test the value of a good lagging—Jones's non-conducting cement. The boiler (vertical) was connected with a puddling furnace, and was not protected by a roof. It was worked at 50 pounds per square inch, and in the second experiment the whole of the shell, an area of about 280 square feet, was coated with the composition. During the experiments the weather was fine and warm, and the coal used, the iron produced, the time of the experiments, and all other circumstances, were exactly similar in the two cases. A water meter was attached to the feed-pipe, and this showed the exact amount of water evaporated with and without the covering. The results were as follows:

Boiler not Covered.

Total water vaporized per meter, Monday to Saturday, 11,690 gallons.

Total time, 126 hours = 92¾ gallons = 14.8 cubic feet per hour.

Boiler Covered.

Total water vaporized Monday to Saturday, 16,060 gallons.

Total time, 126 hours = 127.5 gallons = 20.4 cubic feet per hour = 5.6 cubic feet per hour more than when the boiler was uncovered, a difference which plainly shows the immense loss of heat under the latter circumstances.

Experiments by Jacob Perkins long ago proved that in case of pipes filled with steam at 100 pounds per square inch, 100 feet of surface exposed to the atmosphere is, under ordinary circumstances, sufficient to condense per hour the steam produced by the vaporization of a cubic foot of water.

Regarding this experiment *Engineering* says: "It will be seen that a square foot of ordinary heating surface has about one-fifth the heat-transmitting power of a square foot of freely exposed cooling surface; or supposing that in any given boiler the areas of heating and cooling surface are equal, the effect of the latter, if freely exposed, would be to reduce the evaporative efficiency of the boiler 20%.

The exposed surface of a boiler, or its cooling surface, in no way differs from its heating surface; it is subject to the same laws, and, under similar circumstances, would produce similar effects. That a square foot of cooling surface withdraws from the contents of the boiler a less amount of heat than is imparted to them by an equal area of heating surface, is merely due to there being a less difference between the temperature of the atmosphere and that of the contents of the boiler, than there is between the latter and temperature of the gases in the flues. Other circumstances being equal, the transmitting power of any given area of boiler surface varies directly as the difference in the temperature on the two sides of it, any increase in this difference enabling the surface to transmit a proportionately increased amount of heat in a given time.

WIRE BELTS.—We made some allusion a week or two since to the manufacture of wire belts. We now find the following additional, and more in detail, in the *Iron Age:* "Machine straps of wire, as a substitute for leather, are being made by a German firm. The belts are made of the best crucible steel wire, in transverse network of one to ten wires, in any desirable length or width. The two ends of the strap are joined like the middle, so that there is no beginning and no ending, the belt forming an endless band. All the wires run parallel only across the width, in such a manner that one wire catches into the other like a spiral, a continuous, densely-woven chain being thus produced, the movability of which is so great as to enable it to go round the smallest pulley. The straps are also made with leather or elastic lining, or bordered with leather, elastic, hemp, hair-tape, or any other material, also its interstices filled with gutta-percha, to supply elastic bands with cotton web, and to prevent their stretching. The tightening of the strap—shortening of the chain—which is only necessary once, viz., when put on by means of a strap key, may be effected very easily and very quickly by taking out any desirable number of wires, and again joining the two ends in the same manner by twisting in the required number of wires."

A REMARKABLE case of cohesion, or the welding of two metals at a temperature far below the melting point of either of them, has lately been noticed by Mr. Charles A. Fawsett, of Glasgow, and by him reported to Sir William Thomson. He describes the following experiment, which any of our readers who are curious enough can readily try, to test its correctness: If a piece of silver, one centimeter square, is heated on the inverted lid of a porcelain crucible, to about the temperature of 500° C. (932° Fahr.), and the end of a thin platinum wire is brought into contact with it, the two metals will be found to have welded to that extent that the silver may be raised from the lid, and will remain attached to the platinum wire when cooled off. Mr. Fawsett reports that other metals—copper and aluminum, for example—will likewise adhere to silver, though the experiment is less striking than in the case of platinum.

Balanced Slide Valves.

Many curious attempts have been made within the scope of scientific invention to solve the problem of "balancing" slide valves. Inventors, inspired with a consuming ambition to devise something which could be entitled a "balanced slide valve," have really, with mental centrifugal force, thrust upon a suffering community much in this line, which, instead of answering the purpose intended, has only gone to convince the public of the unbalanced condition of their mental equipoise. We do not intend this as a reflection upon inventive talent, nor to divert such talent from its true course, but rather as a kind of admonition that misdirected mechanical genius finds little favor in the eyes of a tolerant public. We have really seen a "balanced" slide valve so thoroughly balanced that it was impossible to keep it upon its seat when subjected to steam-pressure; and yet the inventor claimed all kinds of imaginary savings for this really peculiar device.

Another "balanced" valve consisted of an ordinary side valve, to the back of which, and at right angles to its face, was attached a circular piston, equal in area to the face of the valve. The valve, when in motion, "rods" upon the end of the piston rod, which terminated in a plate traveling in a groove on the back of the valve. Here was simply a case of transferring the friction from the face of the valve to its back, with the odds in favor of an increase rather than a decrease of friction. Yet this mechanical creation revelled in the title of a "balanced slide valve." Thus far the ruling idea with inventors has been that, in order to balance a slide valve, it is necessary either to exclude the action of the steam from the back of the valve, or else to admit the steam pressure upon the back and face of the valve simultaneously. The possibility of constructing a hollow valve, and balancing it by internal pressure of steam, seems to have been ignored altogether. It is hardly a wonder that so many unsuccessful attempts have been made to accomplish a purpose so radically needed. It is many years since steam was introduced as a motive power, and yet to-day the means of converting its force into work are not very materially different from those employed in its pioneer usage. Steam engines are built day after day with some new-fangled, improved, or automatic cut-off valves, which in some cases do effect a saving of steam and thereby fuel, but in many more they do this even at an increase of friction necessitated by great increase of valve surface.

Little or no advance has been made in balancing the locomotive slide-valve. The pressure upon the ordinary locomotive valve amounts even to tons, yet few attempts have been made to lessen the enormous friction such pressure must entail. Some of our leading railroads have adopted friction rolls to overcome the great loss, the success of which, however, is questionable.

That a valve may be "balanced" *for a purpose,* it is necessary that it should embody the following conditions: 1st. It must "ride" upon its seat with the least possible friction. 2d. It must accomplish this without leakage, or "blowing." 3d. It must be so constructed that any wear upon its face or faces can easily be provided for. 4th. It must combine facility of inspection with durability of construction. 5th. Its form must not interfere with the expansive use of the steam; or, in other words, it must possess the feasibility of a "cut-off." 6th. It must be free from any unsteady or "wobbling" motion when the engine is running by its own momentum independently of steam pressure; this last is an item often overlooked in the construction of slide-valves, and which has frequently been the cause of much undue wear both upon valve faces and seats.—*Engineering and Mining Journal.*

To Prevent Explosion.

Mr. John Napier of Edinburg, Scotland, proposes the following mechanical device for the prevention of boiler explosions: The device consists in the attachment to the boiler of a plate of copper or other metal of similar qualities and ductility, which plate is firmly secured between two perforated plates of iron or other metal, and is covered by them on its upper and lower sides, except at the places of perforation, these places corresponding to each other in the upper and lower plates. The perforations are greater or less in diameter, according to the size of the boiler. Direct communication is established between the apparatus and the interior of the boiler, and according as the thickness of the intermediate plate is varied with reference to the strength of the boiler, it resists a greater or less pressure. When this pressure is exceeded, the steam causes the intermediate plate to give way at one or more points between the corresponding perforations of the upper and under plates, and by the steam thus escaping from the boiler an explosion is prevented. The apparatus, which is intended to be accessory to the ordinary safety valve, may be either attached to the boiler or fitted to a tube or neck secured to the boiler. In order to give additional security, the apparatus may be fitted in two or more places on the boiler subjected to pressure. The plates are so attached to the boiler and to each other that the intermediate plate may be readily removed and replaced by a fresh one.

SCIENTIFIC PROGRESS.

Light and Life.

The question as to how life is affected by the different colors of the spectrum has at various times engaged attention, and plant life has apparently been more studied in this respect than animal. Two distinct series of researches lately described to the French Academy seem to afford some fresh insight into the matter, and it is interesting to compare them together.

One series, by M. Bert, was on plants; the other, by M. Yung, on the eggs of certain animals. M. Bert kept plants within a glass trough inclosure, containing an alcoholic solution of chlorophyl (very frequently renewed), and exposed them thus in a good diffuse light. The solution, which was very weak, and in a very thin layer, intercepted little more than the characteristic region of the red in the spectrum. This excluded part, then, was proved to be the indispensable part of white light, for the plants immediately ceased to grow, and before long died. It is in this red region (as M. Timirizgeff has lately shown) that the greatest reduction of carbonic acid takes place. If red rays are kept from the leaf the plant can no longer increase its weight, it is reduced to consuming reserves previously accumulated, exhausts itself, and dies.

This part of the spectrum, however, though necessary, is not sufficient. Behind red glass plants may no doubt live long, but they get excessively elongated and slender, and their leaves become narrow and little colored. This is owing to the absence of the blue violet rays. Thus each region of the spectrum contains parts that play an active *role* in the life of plants.

Now turn to animals. M. Yung has experimented during three years on the effect of different spectral colors on the development of the eggs of frogs (the common frog and the edible frog), of trout, and of fresh-water snails. It was found that violet light favored the development very remarkably; blue light comes next in this respect, and is followed by yellow light and white light (which two gave nearly similar effects). On the other hand, red and green appear to be positively injurious, for it was found impossible to get complete development of the eggs in these colors. Darkness does not prevent development, but contrary to what some have affirmed, retards it. Tadpoles of the same size, and subjected to the same physical conditions previous to experiment, died more quickly of inanition when deprived of food in violet and blue rays than in the others.—*London Times.*

EFFECT OF ELECTRICITY ON VEGETABLE GROWTH.—During last summer, Pasteur, according to *Comptes Rendus,* made some interesting experiments on the effect of electricity on vegetable and fruit growths. On the 4th of August, he enclosed some vine-sets in hot-beds, almost hermetically sealed. The grapes ripened about October 10th. Grapes that had ripened in the open air fermented in less than 48 hours, in a temperature varying between 25° and 30° (77° to 86° F.), but those that ripened under glass remained unchanged. This result, which had been predicted by Pasteur, lends strong confirmation to his views. Again, on July 30th, 1877, M. Celi planted three kernels of maize under each of two bell-glasses. The weight of the kernels, the kind of earth, and the quantity of water supplied daily, were equalized as nearly as possible. On August 1st, the kernels sprouted. During two days the growth was nearly the same under both glasses. On the third day the plants in electrized air began to develop more rapidly than the other. On August 10th, the following measurements were taken, from the base of the stalk to the extremity of the upper leaves: Plants in electrized air, 17 cm. (6.69 in.); plants in ordinary air, 8 cm. (3.15 in.).

MAGNETISM OF LOADSTONE AND OF STEEL.—Dr. A. L. Holz, a French scientists has investigated the comparative influences of equal amounts of magnetism upon the loadstone and upon glass-hardened steel. He has reached some novel conclusions, among which are the following: 1. The maximum of permanent magnetism in the loadstone, for equal volumes, is about the same as that in the hard steel. 2. The specific magnetism of the loadstone is the greatest of all magnetic bodies yet investigated. 3. The permanent magnetism of the loadstone is sooner reached than that of steel. 4. The quantity of temporary magnetism which disappears, after the magnetizing force is removed, is less in the loadstone than in steel.

ELECTRICITY OF CHEMICAL PROCESSES.—F. Braun finds that the percentage of potential energy convertible into mechanical work, varies inversely with the electric tension; a sudden change in the density of free electricity must be accompanied by a development of heat even if it is not followed by any change of relative distribution; if induction-currents in a spiral excite a maximum of free electricity, half of the work is converted into heat; in currents of small intensity, if a new current is added, a greater development of heat and a less degree of polarization arise when the new current is in the same direction as the original current than when the directions are opposite.—*Annals. of Physics and Chem. (German.)*

INTERESTING EXPERIMENTS IN REGARD TO SPONTANEOUS COMBUSTION.—E. Bing, of Riga, has experimented with different materials; wadding, raw flax, hemp, the waste from silk, wool and cotton spinning as well as sponge, and finally wood dust as found in any cabinet-maker's shop. They saturated with various fluids, viz., oils, fresh and in a gummy state; turpentine, petroleum, various varnishes, etc. All the fibrous materials took fire when saturated with any of these oils or with mixtures of the same. Sponge and wood dust, on the contrary, proved to be entirely harmless. Combustion ensued most rapidly with 17 grains of wadding and 67 grains of a strong oil varnish, in 37 minutes; while 200 grains of washed cotton waste, of which a portion was saturated with 750 grains of strong oil varnish and the remainder wrapped about it, required almost 14 hours. These materials were placed in a well-sheltered spot and subjected to a heat of from 18° to 40° C. Silk did not flame up, but slowly charred. Small quantities seem to take fire sooner than large.

THE MINERAL CERITE. — Although it was known for some time that cerium anilins black was a valuable color, it was not used in calico printing because it was thought that the cerium salts were too expensive, and no attempts to produce them cheaply were made. Recently, however, the manufacture of cerium anilino black has been introduced by Jacob Lytsche, of St. Petersburg, Russia, with much success. It was found that cerium salts sufficiently free from any injurious substances could be manufactured from the mineral cerite by a simple and cheap process which every calico-printer could easily carry out. At St. Petersburg the mineral which is derived from deposits in gneiss, near Riddarhytta, Westmannland, Sweden, is finely powdered, then treated repeatedly with sulphuric acid, and finally extracted with cold water. The cerium aniline black thus made is said to be cheaper and more effective than the vonadium aniline black.

IRON AND SILICON.—Some time ago there was taken from the ground, we forget in what locality, a metallic ingot having the look of iron, but, notwithstanding its long contact with moisture, showing no trace of oxidation. Prof J. Lawrence Smith, who lately analyzed it, found it to be a silicide of iron, containing 17% of silicide. This compound is so inalterable that it will remain without change in nitric acid of 1.40 density, or in bromine. Hydrochloric acid affects it somewhat. The history of the ingot is not known, but it is thought to owe its existence to some accident in the manufacture of iron. M. Daubree, commenting on this in the French Academy, stated that, notwithstanding every effort, it had not been found possible to incorporate more than eight per cent. of silicon with iron. M. Saint-Claire Deville was struck with the analogy of the product in question to the silicide of manganese produced some years ago by M. Brunner.—*Journal of Chemistry.*

CHANGES OF SPECTRA.—If a small quantity of mercury is placed in a hydrogen Geissler tube, E. Wiedeman finds that an inductive current gives the hydrogen spectrum at ordinary temperature. But if the tube is warmed in an air-bath, as the temperature rises the mercury lines appear, while the hydrogen lines grow fainter and finally disappear. If a tube of hydrogen and nitrogen is warmed at any point, so as to free sodium or other metals from the glass, the hydrogen and nitrogen lines vanish almost entirely while the lines of the metal appear. Does the hydrogen disappear, or is it transmuted into some other substance?—*Comptes Rendus.*

ALLOTROPY OF METALS.—M. Schutzenberger, in his investigations of the different molecular states of metals, finds that other metals than antimony, especially copper, lead and silver, take allotropic forms when precipitated from saline solutions, by electrolysis or otherwise. He predicts that this will prove to be the case with a large majority of metals. The less active and more stable modification is formed at the expense of the other, with loss of heat, like red phosphorus from ordinary phosphorus, or oxigen from ozone. Allotropic copper, when oxidizing in the air, takes brilliant rainbow hues, which may have a valuable industrial application.

SNOW ILLUMINATION.—During a recent snow-storm, in the early afternoon, an interesting experiment was tried in Paris. At the moment when the sky was darkened by snow, the electric lamps were lighted in the square of the Theatre Francaie. The reflection of the light from the snow-flakes immediately dispelled the darkness and produced a very pleasing effect. It is proposed to try a similar experiment in misty weather, and if the light can penetrate even to the distance of 20 meters (65.6 feet), Jahlochkoff lamps will be established at points where the passing is most frequent.—*Les Mondes.*

ELECTRO-CHEMICAL ACTION UNDER PRESSURE.—In a series of about 50 experiments, each of which continued for several hours, and during which pressures of 100, 200, 300, etc., atmospheres were maintained, A. Bouvet found the following laws: 1. The decomposition of water by a current is independent of its pressure. 2. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever may be the pressure. The laws are in perfect accordance with the mechanical theory of heat.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 6.		Week Ending Mar. 13.		Week Ending Mar. 20.		Week Ending Mar. 27.	
Alpha	20	17¼	19¾	18	21½	19¼	19¼	16½
Alta	5⅝	5	5½	5	6½	5½	5.90	5
Andes	50c	45c	50c	40c	50c	40c	40c	35c
Alps	....	....	....	....	....	....	....	....
Argenta	1.40	1	1.35	1.10	1.45	1.30	1.10	90c
Atlantic	....	....	..	....	....	....	....	....
Aurora Tunnel	....	....	....	....	75c	....	....	....
Baltimore Con	....	....	....	....	1	....	1	....
Belcher	6⅞	6	9	6⅜	9⅝	8½	8½	6½
Belmont	50c	45c	1	40c	70c	50c	50c	40c
Best & Belcher	20	17¾	19½	17⅞	21¾	18¾	17½	15
Bullion	6¼	4	6	5¼	6⅞	5⅝	5⅝	4½
Bechtel	85c	50c	75c	60c	2.60	1.20	2.15	1.70
Belle Isle	35c	30c	35c	30c	35c	....	35c	30c
Bodie	7	6	6½	5½	6⅞	5½	7¾	6
Benton	4½	3.90	4.20	3¾	5	4	4.20	3
Bulwer	19½	17¼	18	15	17	16¼	17	15½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2	1.40	2⅝	1.60	4½	2¼	4	2½
Belvidere	85c	50c	65c	60c	75c	50c	2	1.45
Booker	1	40c	1	60c	1	60c	65c	60c
Caledonia	3¾	2	3.20	2.70	3¼	2.70	2.65	2.10
California	6½	5¾	6	5¾	6	5⅜	5⅝	4.80
Challenge	3	2½	3½	2.65	3.65	3	3.20	2.10
Chollar-Potosi	46	39½	45	39½	51	45	43½	35½
Comanche	....	....	....	....	....	....	....	....
Confidence	14½	12½	15½	13	18½	15½	14½	10
Con Imperial	1.15	1	1.40	1	1.60	1.35	1.35	1.05
Con Virginia	6½	5¾	5⅝	5½	6	5⅜	5½	4.60
Crown Point	5¾	4.40	6¼	4.90	7	6⅝	5⅝	4½
Con Washoe	....	....	....	....	....	....	....	....
Champion	45c	25c	25c	20c	50c	25c	40c	25c
Concordia	25c	15c	....	....	50c	20c	15c	....
Dayton	50c	....	....	....	....	....	....	....
DeFrees	5c	....	....	....	10c	....	5c	....
Daney	....	....	....	....	....	....	....	....
Day	30c	25c	35c	30c	35c	30c	30c	20c
Eureka Con	29	27½	28	27½	27	24	22	18½
Exchequer	5½	4.80	5½	4¾	5⅞	5	4½	3½
Endowment	10c	5c	5c	....	5c	....	25c	5c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4.80	4½	5¼	4.55	4.60	4¼	4.30	4
Gila	30c	25c	30c	....	30c	25c	30c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10	9	58c	50c	10	9	9½	....
Goodshaw	60c	45c	55c	25c	1¼	45c	70c	50c
Gould & Curry	11½	9¼	10⅝	9¼	12¼	10⅜	9⅞	7
Hale & Norcross	16⅜	14¼	17	14	18½	16	13½	9¾
Hillside	2.60	2¼	2.60	2¼	2⅜	2⅓	2¼	1¾
Highbridge	75c	55c	60c	55c	60c	50c	50c	40c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	....	15c	....	20c	15c	20c	....
Independence	1.60	1.35	1.90	1.60	1.85	1.70	1¾	1.60
Julia	5⅝	4.60	5¾	5⅓	5⅞	5½	4¾	4
Justice	4½	4	4.30	4	4½	4.10	3.80	3¼
Jackson	7½	7	8	7¾	7½	7	5¼	5
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5⅝	4½	5⅝	4¾	6⅛	5½	5	4¼
Kossuth	....	....	15c	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.65	1	1.30	1.10	1.55	1.20	1¼	60c
Lady Wash	1.45	1	1.20	1.10	1.65	1¼	1¼	1
Leopard	85c	70c	80c	75c	90c	80c	1¼	85c
Leviathan	50c	40c	35c	25c	35c	30c	30c	20c
Leeds	1	70c	70c	....	60c	50c	75c	60c
Lee	....	....	....	....	....	....	....	....
May Bello	....	....	25c	....	50c	25c	85c	30c
Modoc	10c	....	10c	....	55c	10c	....	....
Manhattan	2½	1½	1.60	1½	2	1¾	1.80	1¼
Martin White	7	6	7	6¾	7	6⅜	6½	6
McClinton	90c	75c	80c	60c	2½	95c	1.30	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	43	37¾	41	36½	41½	37½	35½	24½
Mides	1¼	....	....	....	....	....	....	....
Morning Star	3	....	....	....	....	....	....	....
North Con Virginia	12½	10½	13	10½	11½	9⅝	9¾	7¼
New York	50c	30c	50c	25c	60c	40c	80c	55c
Northern Belle	9½	9	10½	9¾	11¼	10¾	10¾	9½
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	15c	30c	25c	40c	30c	35c	30c
Occidental	....	....	....	....	....	....	....	....
Ophir	41¼	35½	37	34¾	36¼	33¼	31	24½
Oriental	15c	5c	10c	5c	25c	5c	75c	55c
Overman	12⅞	10¾	12¾	11½	14	11¼	10¾	9
Panther	....	....	....	....	....	....	....	....
Phenix	2	....	....	....	....	....	....	....
Phil Sheridan	45c	25c	40c	35c	40c	25c	35c	15c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6	5	6¾	6	6½	6¾	6¼	5½
Richer	1	75c	75c	65c	1	75c	70c	65c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13½	11½	14	11	16	13½	11¾	9¼
Seg Belcher	....	....	27	25	36	30	....	....
Sierra Nevada	48¾	45	47	44¾	49¾	45½	47½	37
Silver Hill	2¼	1.95	2.20	1.90	2¼	1.90	1.80	1.30
Silver King	8½	....	8½	8	8½	....	8	....
Silver Prize	....	....	....	....	....	....	....	....
nccor	50c	30c	50c	40c	45c	40c	1	30c
Summit	3	2.15	2½	2	2⅝	2	2.40	2
Scorpion	1½	1	1.60	1¼	1.35	1	1.80	1
Solid Silver	65c	40c	50c	40c	45c	40c	40c	30c
South Bodie	30c	....	30c	25c	1	40c	50c	40c
South Standard	....	....	....	....	30c	5c	25c	15c
Star	60c	....	60c	50c	65c	60c	50c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1¾	1.40	1¾	1.55	2.90	1.70	2.30	1.90
Tiptop	90c	70c	65c	55c	80c	60c	1.05	75c
Trojan	50c	25c	25c	20c	25c	20c	20c	15c
Union Con	78	68	76½	66	77	69	66½	53½
Utah	17	13½	18	13½	20	17⅝	18	12
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.55	1.20	1¾	1.40	1.70	1.40	1.35	1
Wells-Fargo	20c	15c	15c	5c	20c	15c	10c	....
Woodville	25c	....	....	....	25c	....	....	....
White Cloud	....	....	....	....	....	....	1	....
Yellow Jacket	19	17	20	16⅝	20¾	17⅛	16	11½

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 21.
570 Alta....5¼@5⅝
110 Alpha....19@18¾
830 Best & Belcher...17@17½
590 Bullion....5⅜@5
930 Belcher....7½@7⅝
200 Baltimore Con....1
300 Benton....4.10@4.20
60 California....5½@5⅝
495 Crown Point....5@4.90
4550 Con Imperial....1.30@1¼
695 Caledonia....2.60@2½
60 Confidence....10½
100 Challenge....2¾
240 Chollar....41@42½
190 Con Virginia....5½
1465 Exchequer....4¼@4.40
510 Flowery....75@65c
50 Geo Douglas....50c
2260 Gould & Curry....9¾@9⅝
1550 Hale & Nor....13¼@13⅝
340 Justice....3.70@3.80
1540 Julia....4.60@4¾
160 Kentuck....4⅞@4.90
460 Lady Bryan....1.10@1.15
165 Lady Wash....1@1¼
500 Leviathan....30c
610 Mexican....34½@35½
225 Mackey....3.95@3.85
395 North Con Vir....9½@9
1420 N Bonanza....1.65@1.80
465 New York....75@80c
800 N Sierra Nevada....5c
165 Overman....10⅞@10
720 Ophir....31@30
1465 Phil Sheridan....25@35c
310 Sierra Nevada...45½@45¾
660 Savage....11¾@11⅞
300 S Potosi....2.20
940 Silver Hill....1.70@1.60
500 Solid Silver....40@35c
450 Succor....40@30c
280 Scorpion....1½
100 Santiago....1
400 Trojan....20c
130 Utah....18@17¼
85 Union Con....66@66½
1510 Ward....1.35@1¼
1310 Yellow Jacket....16@15½

AFTERNOON SESSION.
2445 Argenta....1.10@90c
1350 Albion....40c
75 Belmont....50c
1455 Bechtel....1.70@1¾
115 Bodie....6
1480 Belvidere....1.70@1.45
100 Bulwer....16⅞@17
930 Black Hawk....2.90@3
150 Belle Isle....35c
1025 Booker....85@80c
600 Champion....35c
200 Concordia....15c
430 C Pacific....2.05@2¼
130 DeFrees....5c
1465 Dudley....80@70c
900 Day....30c
280 Eureka Con....22@21
400 Endowment....5c
150 Gila....30c
720 Goodshaw....70@65c
125 Grand Prize....4@4.10
2490 Hussey....20c
2200 Hamburg....60c
350 Highbridge....50@45c
30 Independence....1¾
50 Ida....15c
10 Jackson....5¼
150 Jupiter....90c
395 Leopard....85c@1.05
50 Leeds....60c
250 McClinton....1.30@1.20
450 May Belle....30c
755 Mono....2@2.10
70 Manhattan....1.80
140 Northern Belle....10
60 Navajo....35c
400 Noonday....1¼@1.10
1000 Oriental....60@65c
550 Paradise....1.80@1.70
200 Raymond & Ely....6
660 Red Cloud....1@95c
1600 Richer....70c
20 Real del Monte....3
50 Star....50c
2350 S Bodie....40@50c
680 Summit....2.40@2.30
1280 S Bulwer....90c
1390 S Standard....25c
1055 Tiptop....1.05@90c
295 Tioga Con....2.30@2.15
500 University....50c
520 Richer....70c
850 S Bulwer....80@75c
350 Summit....2.10
410 S Standard....15c
500 S Bodie....45@50c
500 Tuscarora....5c
1250 Tioga Con....2.05@1.90
650 Tiptop....90@75c
1100 University....50c

Saturday A.M., Mar. 22.
340 Alpha....17@17¼
520 Alta....4¾@4.90
650 Argenta....90c
950 Albion....40c
525 Best & Belcher..15¾@15¼
370 Belcher....6¼@6½
935 Bullion....4¾@5⅜
1250 Booker....60@80c
175 Bodie....6@7¾
1000 Benton....3.55@3¾
50 Bulwer....16¼
2440 Belvidere....2@1.80
695 Bechtel....1¾@2
930 Black Hawk....2.65@2½
610 Con Virginia....5¼@5
105 California....1..5¼@5
500 Confidence....10@10¼
115 Chollar....40@39
795 Crown Point....4¼@4.55
5700 Con Imperial..1.15@1.20
300 Champion....35c
1325 Challenge....2¾@2.60
950 Caledonia....2⅝@2.55
275 Caledonia (B H)....2
250 Dardanelles....1
100 Day....30c
500 Dudley....70c
1085 Exchequer....4¼@4.05
190 Eureka Con....20½
490 Flowery....50c
300 Gila....30c
705 Gould & Curry....8¾@7⅞
180 Grand Prize....4
250 Goodshaw....60c
1145 H & Norcross....12¾@11⅝
500 Hussey....20c
900 Hamburg....1½
750 Highbridge....50@45c
420 Independence....1¾
240 Justice....3.60@3.40
1460 Julia....4¼@4.45
80 Jackson....5¼
550 Jupiter....75c
600 Kossuth....15c
365 Kentuck....4¼@4½
510 Leviathan....20@30c
1360 L Bryan....1.10@90c
700 Lady Wash....1¼
50 Leeds....60c
150 Leopard....1.10@1.15
1610 Mexican....30@31
75 Mono....2¼
35 M White....6
75 Mono....2¼
200 McClinton....1.20@1¼
100 May Belle....85c
50 Mackey....2⅞
405 New York....70@75c
445 N Con Virginia....8½@7¾
1480 N Bonanza....1⅓@1.55
100 Northern Belle....9½
120 Navajo....35c
100 Noonday....1.05
505 Ophir....26@25
490 Overman....10¼@10
1850 Oriental....65@75c
950 Phil Sheridau....30c
410 Paradise....2@2.15
900 Raymond & E....6@5½
300 Richer....70c
895 Savage....10¼@10¾
1050 Succor....40@35c
305 Sierra Nevada....42½@42
550 Silver Hill....1½@1.45
300 Solid Silver....35c
100 Scorpion....1.20
25 S Potosi....2.20
750 S Bulwer....60@85c
550 South Bodie....50c
220 Summit....2.15@2.05
710 S Standard....25c
500 Trojan....20c
100 Tiptop....85c
460 Tioga....2.10@2.15
280 Union Con....62@61
215 Utah....15½@15
350 University....50c
200 Wells-Fargo....10c
1745 Ward....1.10@1.15
630 Yellow Jacket....13¼@12¾

Monday A. M., Mar. 24.
1070 Alta....5@5¼
945 Alpha....18¼@16¾
300 Andes....40c
615 Best & Belcher....15@15¼
1120 Belcher....6¼@6¼
970 Bullion....4⅞@4¼
765 Benton....3¼@3
265 Chollar....36@35¼
540 California....5
840 Con Virginia....4¾@4.60
385 Crown Point....4¼@4.30
3745 Con Imperial..1.10@1.05
760 Challenge....2¼@2.10
445 Caledonia....2¼@2.10
365 Confidence....11@12
1680 Exchequer....3.60@3½
1255 Gould & Curry....7@7¼
1430 Hale & Nor....10¾@9¾
360 Justice....3.30@3¼
1435 Julia....4½@4.05
225 Kentuck....5
920 Lady Bryan....75@60c
350 Leviathan....25c
340 Lady Wash....1
1555 Mexican....24½@26¾
40 Mackey....2½
375 New York....55@60c
280 North Con Vir....7½@7¼
1960 N Bonanza....1½@1.15
1355 Ophir....21½@20
270 Overman....9
400 Phil Sheridan....30c
850 Solid Silver....30@35c
1200 Savage....9½@9¼
810 Sierra Nevada....39@37
425 Silver Hill....1½@1.30
80 S Potosi....2.20
1100 Succor....90c
350 Scorpion....1@1.05
365 Utah....13¾@12
270 Union Con....55@53½
1050 Ward....1@1.15
815 Yellow Jacket...11½@12½

AFTERNOON SESSION.
750 Albion....40@35c
1400 Argenta....90@95c
100 Belmont....40c
160 Bodie....6@6½
1320 Bechtel....1¾@1.95
510 Booker....70@60c
745 Belvidere....1¾@1.90
100 Belle Isle....35c
260 Bulwer....17@16½
590 Black Hawk....3@3.40
300 Champion....25@30c
450 Con Pacific....2@2.05
700 Caledonia (B H)....2
450 Dudley....70@60c
375 Day....20@30c
240 Eureka Con....19½@19
580 Grand Prize....4½@4.30
400 Goodshaw....50c
700 Hussey....20c
680 Hamburg....50@45c
350 Hillside....2¼@1¾
300 Highbridge....40c
680 Independence....1¾
200 Ida....40c
50 Jupiter....50c
170 Jackson....5
200 Leopard....1¼@1
150 Leeds....65@75c
300 Martin White....6¼
455 Mono....2@2¼
1200 McClinton....1@1.15
125 Manhattan....1½@1¾
290 Northern Belle....9½@9⅝
430 Navajo....35@30c
750 Noonday....1.05@1
800 Oriental....65@60c
750 Paradise....2
210 Raymond & Ely....5½@5⅝
150 Red Cloud....1

Tuesday A. M., Mar. 25.
600 Alta....5.20@5⅝
60 Alpha....18@17⅞
380 Andes....40@35c
345 Best & Belcher....17@16½
745 Belcher....6⅞
355 Bullion....5⅜
700 Benton....3½@3.40
855 California....4.80@4.90
305 Caledonia....2¼@2.40
855 Con Virginia....4¾@5
1430 Con Imperial....1.20
165 Chollar....40@39
540 Crown Point....4¾@4½
15 Confidence....12½
430 Challenge....2.60@2.65
1070 Exchequer....4@4.10
500 Flowery....60@65c
610 Gould & Curry....8½@8⅝
590 H & Norcross....11½@10¾
125 Justice....3¼@3¾
415 Julia....4.15
70 Kentuck....4¾
560 Lady Bryan....75@90c
130 Lady Wash....1@1.10
350 Leviathan....25c
1595 Mexican....29½@31⅝
140 Mackey....3
1090 New York....65@70c
635 North Con Vir....8¼@8
1160 N Bonanza....1¾@1.40
1165 Ophir....24¾@24½
185 Overman....9½@9¾
1400 Phil Sheridan....20@25c
80 S Potosi....2.20
790 Sierra Nevada....41@42½
420 Savage....10¼@10¾
1880 Silver Hill....1½@1.65
1505 Succor....1@75c
475 Solid Silver....30@35c
100 Santiago....1
1200 Trojan....20@15c
200 Utah....15@14⅝
335 Union Con....57½@59
1245 Ward....1.15@1¼
905 Yellow Jacket....14½@14

AFTERNOON SESSION.
70 Argeuta....1
630 Booker....70c
250 Bodie....6¼@6½
2215 Bechtel....2@2.15
930 Belvidere....1.85@2
100 Bulwer....16@15½
540 Belmont....45c
950 Belle Isle....35@30c
1075 Black Hawk....4@3¾
300 Champion....25@30c
140 O Pacific....2.10@2.20
100 Caledonia (B H)....2
450 Day....30c
800 Dudley....70@65c
165 Eureka Con....19½@20
200 Endowment....25c
50 Golden Terra....9½
360 Giant & O A....5
830 Goodshaw....60@55c
1300 Grand Prize....4.05@4
300 Hussey....20c
50 Hillside....1¾
500 Hamburg....50c
100 Highbridge....45c
680 Independence....1¾
360 Jackson....5@5¼
500 Jupiter....70@60c
295 Leopard....1@1.10
400 Leeds....75@65c
870 McClinton....1.10@1¼
90 Manhattan....1¾
50 May Belle....30c
225 Mono....2@2.05
40 Northern Belle..10½@10¾
300 Navajo....35c
800 Noonday....1.35
400 Paradise....1.90
100 Raymond & Ely....6@6¼
100 Real del Monte....2
500 Red Cloud....1
300 Richer....70@65c
600 S Bodie....45@50c
825 Summit....2@2.15
805 S Bulwer....75@65c
1450 South Standard..15@20c
3610 Tuscarora....5c
225 Tiptop....75c
1110 Tioga Con....2.15@2
450 University....50c

Wed'sday A.M., Mar. 26.
60 Alpha....17¾@18
60 Alta....5¼@5¾
325 B & Belcher....16¾@16½
200 Brilliant....50c
645 Bullion....5⅜@5½
625 Belcher....7¼@7⅜
480 Benton....3⅝@3.60
240 Chollar....42@43
715 Con Virginia....5@4.95
555 California....4.85@4.90
955 Crown Point....4¾@5
440 Caledonia....2.40@2½
2800 Con Imperial...1.20@1¼
50 Confidence....14
320 Challenge....2.70@2¾
605 Exchequer....4@3.90
650 Flowery....55@50c
645 Gould & Curry....8¼@8½
865 Hale & Nor....12@11¼
775 Justice....3¾@3.60
330 Julia....4.15@4
55 Kentuck....4¾@5
200 Leviathan....25c
665 Lady Bryan....90c@1
100 Lady Wash....1.10
915 Mexican....31@30½
100 Mackey....3
15 Mount Dew....2¼
705 North Con Vir....9@9½
1020 New York....70c
1085 N Bonanza....1½@1.40
100 N Sierra Nevada....5c
285 Overman....10½
635 Ophir....25¾@24½
400 Phil Sheridan....15c
1200 Succor....90@75c
764 Savage....10¼@10½
930 S Nevada....44½@45½
100 Solid Silver....35c
725 Silver Hill....1½@1.70
175 S Potosi....2.20@2¼
400 Trojan....20@15c
355 Utah....15¾@15½
785 Union....57¾@57
600 Ward....1.20@1.15
1535 Yellow Jacket....14¼@14

AFTERNOON SESSION.
600 Argenta....1@1.10
100 Albion....30c
50 Bulwer....15¾
990 Bechtel....1.90@1.80
480 Bodie....6¼@6½
625 Belmont....45@50c
505 Black Hawk....3½@3.55
2420 Booker....70@75c
465 Belvidere....1.90@1.85
600 Champion....35@40c
130 C Pacific....2¼@2.15
1400 Dudley....70@80c
190 Eureka Con....16½
445 Grand Prize....4.05@4
500 Goodshaw....60@55c
100 Giant & O A....4⅝
60 Hussey....20c
50 Hillside....1¾
50 Hamburg....45c
2550 Highbridge....45@50c
25 Independence....1.60
500 Jupiter....70c
100 Jackson....5¼
1360 Leopard....1.05@1.10
300 Leeds....70c
480 McClinton....1½
25 Manhattan....1½
500 M White....6¼@6¾
460 Mono....2@2¼

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery s
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
Belvidere M Co	California	3	20	Feb 24	Mar 29	Apr 26	C V D Hubbard	203 Bush st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Dudley M Co	California	2	25	Jan 29	Mar 3	Apr 1	E C Masten	309 Montgomery st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Apr 22	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Navajo M Co	Nevada	5	20	Feb 4	Mar 12	April 3	R H Brown	327 Pine st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
Resolute T & M Co	California	1	10	Dec 28	Mar 3	Mar 31	J L Fields	240 Montgomery st
Savage M Co	Nevada	37	1 00	Feb 17	Mar 11	Mar 31	E B Holmes	309 Montgomery st
Silver Prize G & S M Co	Nevada	4	25	Feb 1	Mar 6	Mar 29	W H Redingtou	111½ Leidesdorff st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 27	Apr 12	J T McGeoghegan	316 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Browu	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgomery st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hackberry M & M Co	Arizona	3	50	Jan 16	——	Mar 29	N C Walton, Jr	324 Pine st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
Northern Light G & S M Co	California	3	10	Jan 23	Mar 28	Apr 15	S F Monroe	419 California st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Taul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
S F Petroleum Co	California	5	16	Feb 6	Mar 11	Mar 31	Wendell Eastou	22 Montgomery st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Slate Creek G M Co	California	1	25	Jan 21	Mar 3	Mar 31	J L Fields	240 Montgomery st
Summit M Co	California	7	05	Feb 4	Mar 11	April 6	R N Van Brunt	318 Pine st
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	Mar 19	Wm H Lent	309 Montgomery st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Moutgm'y st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st
Wide Awake M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brnut	318 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Atlanta M Co	Utah	E B Jago	420 Montgomery st	Annual	April 5
Comancho M & M Co	California	W W Traylor	309 Montgomery st	Annual	April 7
Gold Deposit G & S M Co		J M Buffington	309 California st	Annual	Mar 31
Modock Con M Co	California	J W Pew	310 Pine st	Special	Apr 7

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Mar 20
Standard G M Co	California	W Willis	309 Moutgomery st	1 00	Mar 12

1000 Navajo....35@30c
160 Noonday....1.70
600 Oriental....60c
100 Paradise....1.95
80 Raymond & Ely....6
320 Red Cloud....1¼
975 S Bodie....45@50c
100 Silver King....8
280 Summit....2@2.05
970 S Standard....15c
600 S Bulwer....75@80c
100 Tiptop....75c
785 Tioga Con....2@1.90
50 Tuscarora....10c
1550 University....50c
400 White Cloud....1

130 Northern Belle....10½
350 Navajo....40@35c
250 Noonday....1@1¼
905 Oriental....10@5c
300 Paradise....2.35
500 Raymond & Ely...6¾@6½
690 Red Cloud....95c@1
300 Richer....70c
1690 Summit....2¾@2.40
580 Star....60@50c
2550 S Bodie....40@50c
1000 South Standard..25@30c
980 S Bulwer....90c@1
505 Tiptop....1@1.10
530 Tioga Con....2.15@2
1200 Tuscarora....5c
475 University....50c
155 Manhattan....1¾
1220 McClinton....1.20@1.30
1540 Navajo....25@30c
440 Northern Belle....9¾@10
650 Noonday....1½@1.60
400 Oriental....60c
1325 Paradise....1.95@2
50 Real Del Monte....2.80
200 Raymond & Ely....5½
200 Red Cloud....1¼
325 S Bulwer....65@75c
250 S Bodie....40c
100 Star....60c
20 Summit....2.05
2350 S Standard....10@15c
560 Tioga Con....1.85@1.90
300 University....40@50c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Mar. 20.
370 Alta....5¾@5½
300 Alpha....21@20½
100 Andes....45@40c
200 Best & Belcher..18½@18¼
330 Bullion....5¾@5⅝
600 Belcher....8⅜@8⅜
570 Benton....4¼
270 Caledonia....2.70
1570 Con Imperial....1.35
150 Chollar....45
595 California....5¾@5⅝
450 Challenge....3
780 Con Virginia....5⅞
30 Confidence....15¾@15½
800 Crown Point....5¾@5⅝
1700 Dardanelles....1
450 Exchequer....5
270 Flowery....75c
1055 Gould & Curry...10½@10½
680 Hale & Nor....16½@16
365 Justice....4½@4.10
775 Julia....5¼@5½
200 Kentuck....5¼
950 L Bryan....1.20
500 Leviathan....35@30c
610 Mexican....38@37½
200 Mackey....4
1140 New York....45@40c
275 N Con Virginia....10@9¾
350 N Bonanza....1½
440 Ophir....34@33¾
165 Overman....11¾
400 Phil Sheridan....30@25c
255 Sierra Nevada....45½
525 Savage....13¼@13⅛
310 Scorpion....1¼@1.20
370 Silver Hill....2@1.90
160 Senator....10c
960 Succor....40@35c
500 Solid Silver....40c
130 S Potosi....2.20
600 Trojan....25@20c
40 Utah....18
395 Union Con....70½@69
500 Wells-Fargo....15c
920 Ward....1.45@1.40
765 Yellow Jacket....17¾@17½

AFTERNOON SESSION.
830 Argenta....1.15@1.30
100 Albion....40c
2055 Belvidere....1.45@1.70
210 Bodie....6½@6¼
165 Bulwer....16⅞@17
205 Black Hawk....3¼@3½
1180 Bechtel....1.60@1.90
150 Belle Isle....35c
100 Booker....90c
400 Chieftain....15c
230 C Pacific....2.15@2¼
1500 Champion....35@40c
300 Coucordia....20c
200 DeFrees....5c
3200 Day....30@35c
930 Dudley....50@80c
445 Eureka Con....22
1000 Endowment....5c
175 Grand Prize....4½
1050 Gila....25@30c
390 Goodshaw....70@75c
150 Hamburg....60c
100 Hussey....25c
750 Highbridge....50@55c
50 Independence....1.70
600 Ida....5c@1
300 Jackson....5½
50 Jupiter....1
760 Leopard....90@95c
405 Mono....2¼@2.15
200 Manhattan....1.90
870 Minnietta Bell....10½
300 McClinton....1.30@1.40

Thursd'y A. M., Mar. 27.
260 Alta....5⅝@5⅞
280 Andes....40c
130 Alpha....19@19½
120 Best & Belcher...17½@17⅜
1090 Belcher....8½@8½
530 Bullion....5⅛@5⅝
30 Benton....3.70@3.80
195 California....4.90@5
395 Con Virginia....5@5⅛
770 Crown Point....5¼@5¼
60 Chollar....42½@43½
1655 Con Imperial..1.30@1.35
115 Confidence....14¾
210 Caledonia....2¼@2.65
365 Challenge....3@3.20
480 Dardenelles....1@1¼
420 Exchequer....3.90@3.95
50 Flowery....60c
340 Gould & Curry....8½@8⅜
285 Hale & Nor....12¼
690 Justice....3.65@3.80
1145 Julia....4.15@4¼
255 Kentuck....5
800 Kossuth....15c
130 Lady Wash....1.10
300 Lady Bryan....1¾
400 Leviathan....30@25c
750 Mexican....33½@33¼
250 Mountain View....2½
200 Mackey....3.10
125 New York....75c
185 North Con Vir....9¾@9½
705 N Bonanza....1½@1.45
420 Ophir....26¾@26¼
145 Overman....11⅛@10¾
900 Phil Sheridan....20@15c
295 Sierra Nevada...47½@46¼
30 Savage....11⅛@11
230 Succor....90@80c
375 Silver Hill....1.80@1.65
485 Scorpion....1.60@1½
500 Solid Silver....35c
110 S Potosi....2¼
150 Trojan....15c
330 Union Con....59½@58½
135 Utah....16½@16
575 Ward....1½@1.20
1245 Yellow Jacket...15¾@15½

AFTERNOON SESSION.
430 Argenta....1@1.10
50 Albion....35c
100 Belle Isle....30c
70 Bulwer....15½@16
1000 Bodie....6@6½
1550 Bechtel....1¼@1.55
100 Belmont....40c
750 Belvidere....1.60@1¾
500 Black Hawk....3¼@3.60
780 Booker....65@75c
1608 Champion....30@40c
250 Concordia....25c
1000 Chieftain....15c
420 C Pacific....2.10@2.20
10 Caledonia (B H)....1.90
1600 Dudley....70c
3870 Endowment....30c
255 Eureka Con....15@16
270 Goodshaw....55c
370 Grand Prize....4@4.10
200 Gila....30c
20 Golden Terra....9
50 Hillside....1.80
850 Hussey....20c
550 Highbridge....45@50c
100 Independence....1.60
950 Jupiter....50@60c
100 Jackson....6
870 Leopard....1@1.05
100 Martin White....6¼@6½
340 Mono....2.05@2.10

Pacific Board—Latest Sales.

Wed'sday A.M., Mar. 26.
10 Alpha....17¾
120 Alta....5¾@5½
110 Belcher....7¾@7.30
30 Bullion....5.40@5.30
15 Best & Belcher...16¼@16¼
75 Con Virginia....5
490 Con Imperial....1¼@1.20
180 Crown Point...4.85@4.80
125 California....4.95@4⅞
100 Challenge....2.70@2¾
30 Chollar....42
95 Exchequer....3.90@3¾
90 Gould & Curry....8¼
170 Hale & Nor....11¾@11½
120 Justice....3.65
155 Julia....4 05@4½
10 Kentuck....4.95
90 Mexican....30½@30¾
120 Ophir....24¼@23
10 Savage....10¼
70 Sierra Nevada....45¼@45
310 Silver Hill....1.60@1.65
20 Utah....15⅝
20 Union Con....57
405 Yellow Jacket...14½@14¼

AFTERNOON SESSION.
100 Bullion....5¼
50 Benton....3¾
20 Best & Belcher....16¾
30 Caledonia....2.45
30 California....5
20 Challengo....2¾
40 Confidence....14
10 Con Virginia....5
145 Crown Point....4.95
100 Dayton....35c
30 Eureka Con....19½
600 Exchequer....3¾
550 Gould & Curry....8¼@8¾
185 Hale & Nor....12@12¼
45 Julia....4½
10 Justice....3.65
10 Kentuck....4⅞
200 Mackey....2⅞
20 Mexican....30½
50 McClinton....1¼
200 New York....70c
10 N Con Vir....9
120 Ophir....25½@25¼
50 Overman....10⅞
100 Phil Sheridan....16c
1000 S Utah....14@15c
50 Silver Hill....1.70
25 S Bodie....50c
150 Trojan....20c
10 Utah....15⅝
50 Ward....1.15
10 Yellow Jacket...14⅞@14⅞

California Board—Latest Sales.

Wed'sday A.M., Mar. 26.
50 Alpha....17¼@17¼
60 Alta....5¾@5⅝
60 Best & Belcher...17¼@17⅛
30 Belcher....7¾
10 Bullion....5½
500 Crevice....12½c
50 California....5@4.95
45 Con Virginia....5¼
300 Con Imperial....1¼
35 Crown Point....5
150 Caledonia....2¼
185 Exchequer....4@4.05
80 Gould & Curry....8¼
40 Hale & Norcross.12¼@11⅝
90 Julia....4¼@4.15
40 Mexican....35
1000 Monumental....5c
100 N Sierra Nev....5c
30 Ophir....24¾
700 Phil Sheridan....15@16c
1400 S Utah....11@13c
30 Savage....12
40 Sierra Nevada....46
100 Silver Jacket....80c
100 Trojan....17c
30 Uuion....56½
200 Wm Penn....8c
60 Yellow Jacket...15@15¼

AFTERNOON SESSION.
500 Ætna....5c
50 Alpha....17½@17¼
60 Alta....5¾@5⅝
100 Alexander....4½
100 Black Hawk....3¼@3.65
40 Bullion....5½
40 Best & Belcher....16½
40 Belcher....7¼
40 Caledonia....2.40
150 Concordia....20c
30 Con Virginia....5
40 Crown Point....4.90
200 Con Imperial....1¼
40 California....5
30 Chollar....42
30 Challenge....3
100 Crœsus....15c
250 Enterprise....1
70 Exchequer....4@4.05
200 G Deposit....75c
60 Gould & Curry....8¼@8¾
30 Hale & Nor....11⅞
30 Julia....4.05
30 Justice....3¾
100 L Bryan....1.05
40 Mexican....31
100 New York....64c
20 Ophir....24¾
40 Overman....10¼
150 Phil Sheridan....15c
130 Silver Hill....1¾
20 Savage....10½
200 S Utah....13@12c
30 Sierra Nevada....45
110 Trojan....15c
230 Tiger....1.10@1.15
300 U Flag....5c
20 Union Con....57
200 Wales....1¼
50 Yellow Jacket....14½@14¾

Mining Share Market.

The stock manipulators have allowed mining stocks to decline of late, till a decided panic has taken place. Thero was nothing from tho mines to warrant this beyond the fact that no immediate benefit could be made to accruo to tho Comstocks from the Sutro Tunnel compromiso. However, this was largoly used as an excuse, together with the expected disastrous effects of the new Constitution on stock operations, if adopted next May. Theso are, to great extent, mere pretexts. The present break did not come without assistance, and that assistance, beyond a douht, was furnished by the insiders to force the marginal stock npon tho market. This stock was finally squeezed out and immediately absorbed by somebody, which is enough to warrant the opiuion that the break was forced for this purpose, and perhaps the passago of these shares from weaker into stronger hands will open up the way to a more active and advancing market. Tho shrinkage is more severe than any folt since last Octoher. Any one familiar with the history of stock deals will remember that for a number of years past there has been a depression in the market at ahout this time, the one a year ago being peculiarly heavy. They all may be attributed to the same cause, viz., that people early in the year buy stocks at inflated prices in expectation of a "spring rise" or sometbing else, and as a result get the benefit of a fall. The present panic is peculiar, in that stocks have not for some time back heen running at fancy or inflated prices. Toward tbe close a slightly better tone prevailed, operators feeling that the marginal stocks being disposed of, tbey were better able to strengthen and enliven the market. Bodie stocks generally held their own—perbaps because they had their crash at the end of last week. All otbers, almost, fell and can scarcely as yet be said to have revived.

The Bequette System of Milling.

A plan for flour milling, dovised by Mr. D. Beqnette, and which has been styled a "mill without walls," owing to its peculiar style of construction, seems now in a fair way to be practically tested. Mr. Bequette builds a mill something on the pyramidal style, each story being smaller than the one beneatb it, thus gaining strength, solidity, capacity and altitude where they aro most needed. He groups his machinery around the center of tbe building, from story to story, in a way to secure great economy of power at a low cost for building and other outlays. His project is advanced as a great benefit to the State, by enahling its farmers and merchants to export flour, instead of wbeat, thus giving employment to a great number of people in the manufacture of flour, and cases to contain it, leaving the bran and offal to be used by otber branches of industry or production, and saving the freight on exports of waste material and the cost of imported grain hags, which would collectively effect a saving of several millions of dollars annually to the producers and consumers of breadstuffs. It is claimed that a Bequette mill would enable its proprietors to handle large quantities of grain, and produce a superior article of flour, at less cost than mills built upon the old and imperfect metbods, while such a mill would cost mnch less tban one of the present style of half its working capacity.

In order to test tbis system practically, an incorporation consisting of practical millers has been formed, and styled the "Cosmopolitan Milling Company," with offices at 712 Sansome street. The proposition is to erect a mill immediately, providing enough funds are subscribed. The experiment will be watched with interest to discover what measure of success it may attain.

Columbia River Bar.—The channel at the month of the Colnmbia river is said to be changing. It is tbe opinion of Col. Gillispie and others versed in such matters who have observed tbe movement of the bars that in a few years at most tbe main cbannal will be between Sand island and what is known as the middle sands. The bar across tbis channel is gradually washing out, and light draft coasters now occasionally come in that way, the water being 13 feet at low tide. The channel is true west from Chinook Point, and is almost straight from the southernmost point of Sand island. Should the depth become great enough in this new channel, the terrors of the Columhia river bar will have almost entirely disappeared. — *Crescent City Courier.*

Exhibits for the Australian Exhibition.

We have received a circular from Messrs. Edward Clarke & Co., 434 California St., S. F., inviting exhibits from this coast to the coming international exbibition at Sydney. Messrs. Clarke & Co., are authorized to receive the same.

Emigration continues to pour tbrough Burlington, Iowa, westward bound. These emigrants are mostly American farmers who expect to settle on new lands of Kansas, Nebraska and southern Colorado.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Volcano Notes.—Cor. *Ledger*, Mar. 22: T. Atkinson has opened a new claim in the Boulder Flat range. Baker, who bought the John Green claim, is running it night and day, and has a good clean-up in prospect. The Grass Valley claim, is tearing away at a furious rate. China hill, Union flat, Indian gulch and Grizzly hill, are all sending their quota of slickings to enrich the valleys. Moyle's hoisting works in the flat, have been delayed some on account of too much water in the ground. It was impossible for the Cornish pumps to keep it down in the pit so the men could work. J. Greisbanch will finish a crushing of 100 tons at the Mace mill this week, that will average $50 per ton, and has 80 tons on the dump at the mine that will pay $70. The Santa Cruz company have taken out some fine ore, and intend testing it at a mill soon. The only one in the vicinity—Stewart's mill—is kept constantly running on the Downs rock. Jones & Robinson have a fine lot of ore on their dump, with a good prospect of keeping it there, unless some enterprising man will come this way and build a small custom mill.

Plymouth Items.—The contract for sinking in the John mine is nearly finished. The shaft is 50 ft deep, and fine looking ore lies on the dump. The south extension is also being worked by other parties, with flattering prospects. The crushing of rock from the Victoria surrendered only $1.90 per ton. Charles Green & Co., have bought the north extension of the Illinois claim, from a man named Figgs. The Pioneer, owned by John Evans, adjoins the New London claim, south of Plymouth. The bottom of the shaft is covered with a strata of good ore, and the prospects for a paying mine is cheering. Negotiations are progressing for the disposal of the property. A company from below is expected to take hold.

CALAVERAS.

Gravel Mines.—*Chronicle*, Mar. 22: Brown & Co., tunnel claim, are working steadily, although not evincing a disposition to crowd things to extremities. They have one of the best claims in this section of the country. At present operations are confined to running a single drift necessary for the full development of the mine. At the Rough Diamond there is no particular change noticeable. The mill is not run steadily, the force of hands employed being unable to mine gravel as fast as the stamps can crush it. The Hoey & Sliter mine, in Old Woman's gulch, is in full blast again, having been bonded to a San Francisco company. Various improvements have been made about the mine, and the work of taking out gravel has commenced. Moser & Co., proprietors of the Bonanza hydraulic, are washing a vast deal of gravel. They are "wearing out" Tunnel ridge with rapidity. No clean-up has been made in the Bonanza this season, but the gravel looks and prospects first-rate. A partial clean-up is to be made next week.

EL DORADO.

Kelsey Mines.—Cor. *Democrat*, Mar. 22: The Gold Deposit will start immediately and the Robinson process for rebellious ores will be thoroughly tested. The Rosecranz mine has changed owners, and the work of putting it in running order will commence in a few days. The Estrella will probably start in a short time.

INYO.

Mining Notes.—*Independent*, Mar. 22: The Golden Star, owned by Cartier & Co., has a shaft 65 ft deep. The vein is an unbroken one of fine, gold-bearing quartz, with well-defined, good walls, and 20 inches wide at the bottom. The ore assays from $50 up to $5,000 per ton. Samples taken from the bottom show lumps of fine gold weighing from two to five grains each. The Eureka, a 30-ft shaft, shows a permanent ledge, carrying plenty of fine, free gold. Messrs. Woolsey & Phillips has some splendid prospects for valuable silver and lead mines, among which are the Woolsey ledge, the Burlington, Moscow, Chalfant, and others. One carefully selected sample from the Burlington gave the extraordinary assay of 1,920.91 ounces of silver, valued at $2,488.54. Others assay from $60 to $200 per ton in silver, and average 60% of lead. The Manhattan, owned by A. W. Eibeshuiz, has been opened so far by a shaft 67 ft in depth. Two samples of the ore assay as follows: First, silver, $116.23 per ton, 64% of lead; second, silver, $197.20, and 55% lead. Since the 1st inst. the Union Con. furnace at Cerro Gordo has been running steadily, putting through 20 tons of ore per day, the largest possible proportion of which is silver or San Felipe ore. The new works are yielding about nine tons per day of lead ore, and as the furnace started up with 300 tons on baud there is no reason why the run should not be continuous. One of the Hanger locations is a solid 16-inch vein of splendid gray carbonate metal paying well for shipment to and reduction in San Francisco. At depths of 100 ft the Beveridge District mines (across the summit) of Messrs. Porter, Hughes & Co., show gold ledges of increased strength and richness. The 30-stamp Brown Monster mill is running steadily on the low-grade gold and silver ores of the mine. Messrs. McKnight & Tully, of Virginia City, making their headquarters at the Shepherd place, have been for some time working mines directly opposite George's creek, with fine bodies of mineral, and important operations in the near future are indicated.

MARIPOSA.

Coultervile Mines.—Cor. *Gazette*, Mar. 22: The Martin & Nallin mine is not working at present, for the reason there is some 500 tons of high-grade quartz on the dump and no mill to work it. A new steam mill will be built close to the mine this coming summer, thus saving the expense of packing the ore some two miles on mules to get it to Hasloe mill. Mr. James Shimer has bonded the Bondurant to Mr. Bacon and others, of San Francisco. They intend to commence putting up hoisting and pumping machinery immediately, and then sink a working shaft to a considerable depth, run levels and put the mine in shape for working systematically. The ore carries a large percentage of sulphurets of galena and iron that has assayed as high as $4,000 per ton. The Eureka and Merced mines are turning out splendid ore; running the water-power arastra on ore from the former mine, which is paying $100 per ton. The ore is heavily charged with sulphurets of galena, zincblende, iron and a small percentage of telluride of tellurium. A short time ago a crushing of a few tons from the Merced paid $18 per ton. The ore is decomposed, and as the vein matter is from one to two ft in width, it is very easily mined and arastraed. Both mines are worked by tunnels, and can be to a depth of 1,000 ft or more. The General Ord mine is owned by Longhurst, May, and Allen. They are running a tunnel on the vein, which is in about 90 ft. At this point the vein is two ft in width, showing plenty of freed gold and a large percentage of sulphurets of galena, zincblende, and iron. They have a good water power right at the mouth of their tunnel, and contemplate building a five-stamp mill this coming summer. The Compromise mine, owned by Mr. A. G. Black, is not working at present, for the reason that there is a large amount of ore on the dump and no mill to work it with. Deepest shaft on the vein, 100 ft; width of vein, two to three ft; pay ebute fully 400 ft in length, with dyke crossings, one of the best indications there is of a permanent and lasting mine. The ore is of high grade, carrying a large percentage of sulphurete of galena and iron, which is worth $900 per ton.

MONO.

Dudley.—*Standard*, Mar. 24: The main west crosscut, 300 level, is in 257 ft. No particular change in ground since last report. The north drift is in 124 ft, and the south drift 85 ft. There has] been a great improvement in the vein in both of these drifts. An upraise is about to be started to connect the 300 level with the old workings, and the rich ore body there developed. This will serve the purpose of an air shaft, and at the same time will be used as an ore chute for taking out the ore.

Blackhawk.—During the week the shaft was sunk six ft; total depth, 320 ft. The bottom of the shaft is still in vein formation A station has been cut out and crosscuts have been started both east and west. The west crossent is in 11 ft, showing some quartz diffused through the rock. The south drift on the Warren vein was advanced seven ft; total length, 23 ft. The north drift is 10 ft in length. Total length of drift on the vein is 37 ft. In the face of the north drift the vein has narrowed slightly, but in the south it has widened. The character of the ore is about the same, and will average across the vein—four ft $65 per ton. The crosscut has advanced four ft during the week, making 11 ft on the west side of the Warren vein. It is expected that the outlying ledge will be cut at any time. The rock is still hard. An ore house and blacksmith shop is being built.

Belvidere. No change to notice in the west crosscut. A winze has been started on the Great Western vein at a point in the north drift, 200 level, 40 ft north from the main west crosscut, where some very good ore was found in drifting on that vein.

Standard.—The north drift from the main shaft, to connect with the incline is in 45 ft. The ledge is two and a half ft wide, and looks well. The south drift is in 270 ft; progress during the week, 14 ft. The ledge is three ft wide of good average ore. The ledge in the upraise in this drift four ft wide, and is looking very well. The north drift from the east crosscut, 300 level, is in 127 ft, showing a ledge 18 inches wide, of good ore. The north drift on the West Standard, 200 ft from the south line, which is down 10 ft, showing a ledge 18 inches wide, of very rich ore. The drift on the Cook ledge is in 200 ft from the south line. The ledge is two ft wide, of good average ore. The stopes are all looking well.

Bechtel.—On the 400 level, about 300 ft south of the shaft, a body of rich ore was drifted on, and the mine was thrown open to the public. The vein is as strong as any ever discovered in the district, and from present appearances it bids fair to continue to the south end of the Bechtel line, about 500 ft south of the end of the present drift. Ore is now being hauled to the Syndicate mill from this mine, and crushing will commence about March 25th. Stoping has been commenced and the drift will be pushed ahead with all possible dispatch. The Sitting Bull ledge is also looking very fine, and much ore of a high grade is exposed for stoping.

Tioga.—The work of excavating a station at the depth of 520 ft in the shaft is now in progress. Crosscuts both east and west will at once be started; also a lateral drift to be extended the full length of the mine. On the 420 level the east crosscut is now in 135 ft, with no important change to note. On the 320 level, north drift from the east crosscut is in 56 ft. The ledge is two ft wide, of good milling ore. This drift looks very promising. The west crosscut, same level, is in 245 ft.

Red Cloud Con.—The west crosscut, 400 level, is in a distance of 148 ft from the shaft. The formation at present indicates that the ledge will be found pitching west. The south drift on the Red Cloud ledge, same level, is in 37 ft. The ledge is 30 inches wide. On the 250 level a south drift has been started on the ledge cut in the west crosscut from the south drift on the Red Cloud vein. The ledge is 18 inches wide, and prospects about $16 per ton, in gold.

Bulwer.—The south drift, 380 level, is now in from the winze 116 ft. The ledge is two and a half ft wide, of good ore. The west crosscut from this drift is in 58 ft, and on the 15th inst. a very fine ledge was passed through, three ft wide. The ledge in the Stonewall stopee is looking well. The ore at the Bodie mill is turning out very well. Bar No. 2 has been shipped, valued at $16,506.08, and 600 ounces of bullion was carried over to the next melting.

MONTEREY.

Chualar Canyon Mines.—Salinas *Index*, Mar. 20: Mr. T. S. Baldwin is working and developing a mine in Chualar canyon. The lode runs nearly north and south, dips to the west, is 20 ft wide between the casings and has been traced for over two miles. The lode is now faced up the whole width to a perpendicular hight of 40 ft. A sample of the ore sent to San Francisco for assay, showed 22½ copper, $30 in silver to the ton, and $12 in gold. The copper is distributed throughout the entire width of the lode, and the gold and silver are found close to the casings, which are said to be largely composed of iron.

La Mines.—San Jose *Mercury*, Mar. 21: At present the company have one large bunker capable of holding 200 tons of coal, and the coal is loaded into vessels by means of a chute. The main tunnel is in 700 ft with two different branches leading off, both of which contain rich deposits of coal, and the work of taking out the coal is being pushed forward as fast as space will allow. All around on every hand can be seen coal, and there are as many as a dozen chutes, all of which had men at work sending the coal down into the cars, which are run out and emptied into the bunkers. The seam of coal varies from five to nine ft and is of good quality, comparing very favorably with the Wellington, and readily finds sale in the San Francisco market at $10 per ton, $12 per ton, while the screenings are sold from $3.50 to $5.

NEVADA.

Mining Notes.—*Foothill Tidings*, Mar. 22: The new mill of the Scadden Flat company is expected to be in readiness to commence dropping its stamps about the 1st of April. The tunnel of the Planet mine is in over 1,050 ft. A clean-up of 18 loads of rock has just been made at the Omaha mill, of ore from the New York Hill mine, which yielded $100 per load. Improvement is noted in size of ledge, quality of rock and general appearance. Extensive improvements are going on at the Spenceville copper mine. The Empire mine is reported as about to shut down. Within the last few months it has run several hundred dollars behind. A number of the miners have been discharged and the pumps taken up to No. Six. New Rocky Bar is about putting in a larger pump. Water has prevented much headway of late, but the mine looks well.

Watt Blue Gravel Mine.—*Transcript*, Mar. 22: The west drift is in 103 ft. The bedrock is granite and is raising very fast as they advance west. The bedrock has raised 12 ft in the whole distance. Everything is running as usual.

The Pittsburg.—There is no material change in the mine. The 600 north drift has been run a distance of ten ft. The lode in the latter drift presents well and is yielding good ore. The 500 north drift has been run six ft; this drift is also yielding good ore. All the stopes are producing well. The mill is running up to its capacity on company ore. All the machinery is doing finely.

NEVADA.

WASHOE DISTRICT.

Con. Virginia.—Gold Hill *News*, Mar. 26: The joint California winze from the 1950 level is down 90 ft, and averaging two ft per day through hard rock. A station is being cut out in the joint north drift from the west drift, 2150 level, for the purpose of starting an upraise to meet this winze.

Sierra Nevada.—The drift on the 2200 level connecting the east shaft and the incline, is now being graded and thoroughly timbered for a thoroughfare between the two points. The main incline is making usual progress through hard, brittle cap-rock nearly all of which is quartz, giving low assays. There has been a slight increase of water in the incline during the week, but not enough flows in to interfere materially with siuking. The bottom of the incline is to-day 92 ft below the 2300 level.

Julia Con.—The pumps are being worked carefully and are lowering the water slowly. The donkey pump at present is forcing the water through two miles of three-inch pipe besides raising it, as the pipe is not sufficient in size to convey off the water raised. The pipe being placed in the tunnel is six-inch. Through this the water will be forced by a pressure from the top of the tank of 20 ft, the pipe leading to the same being eight-inch.

California.—The C. & C. shaft is now 172 ft below the 2150 station, in hard blasting rock. The flow of water into the shaft from points above continues strong. The joint winze is making two ft per day through hard rock, and is down 90 ft. The usual repairs are being made to the joint drift, 1650 level, leading to the C. & C. shaft and to the Consolidated shaft below the 1400 level.

Union Con.—The joint Mexican winze from the 1600 level is adding three ft per day to its depth, and passing through hard blasting porphyry. It is now down 308 ft. The drift connecting with the Sierra Nevada on the 1465 level is still being repaired. The ventilation has been greatly increased by the connection between the Sierra Nevada and North Con. Virginia.

Belcher.—On the 2050 level the south drift is making five ft per day along the ore vein, and is in 383 ft. Fresh air has been conducted to the bottom of the incline by placing lining in so that the fresh air goes down on one side and the heated air up the other. The bottom of the incline is 170 ft below the 2500 station.

North Bonanza and Flowery.—The joint shaft is being sunk and timbered at the rate of 30 ft per week. It is following the east wall on down and is without increase of water. The pits for the new machinery have been completed, the anchorage put in, the anchor bolts placed and a couple of feet of foundation laid.

Mexican. The joint Ophir upraise from the 2100 level is making two ft per day, and is now up 46 ft. The joint winze is now 308 ft and continues in hard blasting porphyry. It is averaging three ft per day.

Ophir.—The joint Mexican upraise from the 2100 level to connect with the 2000 level is now up 46 ft and averaging two ft per day. The main incline is now 140 ft, on the slope, below the 2200 level, and is cutting birdseye porphyry containing stringers of quartz.

Justice.—The crosscuts west on the 1300 level continue to cut favorable looking vein matter carrying spots and seams of rich ore. The surface workings in the old Waller Defeat ground continue their yield.

North Con. Virginia.—The hot air coming from the Sierra Nevada up the shaft sometimes overcomes the men and makes the work slow, still it is making five ft per day. The new engine is ready to start as soon as the cables arrive.

Exchequer.—The north drift, 2400 level, is making four ft per day through soft vein porphyry, carrying streaks of quartz, and requiring to be closely timbered. Increased ventilation has been secured in this drift by putting larger air pipes in.

Gould & Curry.—Three shifts of nine men each are at work retimbering and repairing the old drain tunnel which was found to be very badly caved. The joint east drift on the 1700 level is averaging five ft per day through good working rock. At the Osbiston shaft the cutting out of a tank pit at the 400 level is completed.

Hale & Norcross.—The entire force employed is engaged in timbering and bracing the timbers in the 2000 east drift connecting with the Chollar-Norcross-Savage shaft, preparatory to allowing the water to raise and flow through this drift. The timbers in the incline have been strengthened and braced from the 1900 to the 2000 level, and the pump-rod stayed.

Ward.—The new engine is running to perfection. The shaft has been cleaned to the water's edge, and is being emptied out. On the 800 level the station is being enlarged to take in the south compartment of the shaft.

Lady Bryan.—The shaft below the 600 station is making good progress in bird's-eye porphyry. The west crosscut from the north drift has entered the quartz formation and is showing some very good rock. The east crosscut is in porphyry carrying large quantities of iron and stringers of quartz.

Chollar-Combination Shaft.—The house for the air compressor is finished and the boilers are set. The pumps are discharging over 100,000 gallons per day into the Sutro tunnel, holding the water below the 2200 station.

Utah.—Sinking the main incline was resumed Saturday evening, and it has now attained a depth of 350 ft on the slope below the 1350 station. The ground is good.

Overman.—The north lateral drift, 1600 level, is skirting the vein at the rate of six ft per day. Very hard rock and considerable water are encountered in the winze below this level.

Caledonia.—The east drift on the 1600 level is cutting very hard rock, rendering progress slow. The O & C shaft is averaging a set of timbers per day; total deptb, 530 ft.

Yellow Jacket.—Sinking below the 2280 level has been resumed and is now down 45 ft. The new compressor is in operation and works well.

Con. Imperial.—The drift north from the winze on the 2600 level is showing some most promising looking quartz, although skirting the vein.

Best & Belcher.—The joint east drift on the Curry line is in 667 ft from the lateral drift, and is making good progress in hard, dry rock. East crosscut No. 1, 1900 level, is averaging five ft per day in hard, blasting porphyry.

Alta.—The north drift, 1550 level, is still following the ledge in Benton ground and is making good progress. The joint winze below this level is being continued on down toward the 1750 level, where crosscuts are to be run at the same time that the vein, laid bare on the levels above, is opened up.

Leviathan.—The new cables for the vertical shaft having been received from San Francisco and put in running position, work is actively resumed in full at the 750 level. Both lateral drifts north and south are being pushed ahead actively, with excellent ore prospects in the face of both.

Savage.—General repairs are being made to the incline, but above the water level. The pumps hold the water below the 2000 level. Everything about the mine is ready for shutting down the pumps.

Crown Point.—The north drift, 2500 level, is being continued along the edge of the vein preparatory to running crosscuts to open up the formation. The usual work is being done in repairs.

Solid Silver.—Clearing out and retimbering the north end of the main tunnel or adit beyond the caved ground continues making good progress.

EUREKA DISTRICT.

The Eureka Con.—*Sentinel*, Mar. 24: Work has continued at the mine, and good progress made in the extension of drifts, etc., there having been 239 ft completed during the week. The ore bodies in the several levels are looking well and holding out well. The furnaces are running first-rate, having turned out 342 tons of bullion in the last seven days. The following work has been done: Fifth level—East drift from cave continued 50 ft, and is now in 278 ft; raise made, 14 ft, and is now up 66 ft. Seventh level—East drift from chute continued 17 ft, and is now in 211 ft. Eleventh level—West drift from ore chamber made 18 ft, and is now in 138 ft. Twelfth level—East drift continued 33 ft, and is now in 459 ft; south drift, east raise, continued 27 ft, and is now in 87 ft; south drift from west raise continued 30 ft, and is now in 86 ft. Thirteenth level—West drift continued 30 ft, and is now in 99 ft.

The Hamburg.—Interuediate drift advanced 18 ft, and is now within five ft of connecting with the upraise from the 450 level. The vein followed by this drift continues about the same. East crosscut, 450 level, has reached the shale hanging wall. Six hundred level—West crosscut advanced seven ft, a total of 123 ft. The rock has been very hard, but is now much softer in the face, and works well. The winze below the 600 level has been completed to the 700 level.

WHITE PINE DISTRICT.

Baldy Sour Mine.—*Sentinel*, Mar. 21: New York parties controlling the Baldy Sour mine, of White Pine, have telegraphed to their Superintendent to let contracts for a long drift from the 100 level of the Dawson mine. The interest being taken in White Pine mining property by Eastern capitalists argues well for an early resumption of active work on several mines of undoubted value situated on Treasure hill. A contract has already been let for drifting north from the same level in the same mine.

[Continued on page 204.]

Sanitary Influences of Trees.

[The following paper was read before the California Academy of Sciences, March 17th, 1879, by HON. B. B. REDDING.]

This subject has received but little consideration until within the past few yeare. It was rather from observation than as the result of direct experiment that it was ascertained that trees do exercise a marked influence upon the health of persons living in miasmatic districts. When this was noted, it seemed desirable, firet, to learn wherein air impregnated with miasma differed from the air over deserts that does not contain miasma; and secondly, to learn of what miasma consists. It must he confessed that the thousands of carefully conducted experiments by the ablest men, while tbey have resulted in adding vastly to the store of knowledge on cognate subjects, yet they have not satisfactorily answered these questions. De Saussure experimented on the quantity of carbonic acid in the air at Geneva; Verver, in Holland; Boussingault, in Paris; Roscoe, in Manchester; Schulze, at Rostock; and Von Pettenkofer and Wolffhugel, in Munich. Dr. Von Pettenkofer states that the variations in the result of these experiments, very small from the first, are found to be still smaller as the methods of determining carhonic acid bave been perfectcd. It is the same as regards the oxygen in the atmosphere. Dr. Von Pettenkofer caused air to he brought in hermetically eealed tubes from the desert of Sabara for the purposes of analysis, and adds, as the result of all his experiments, that the amount of oxygen and carhonic acid does not differ in air taken from the summit of Mt. Blanc, from deserts, from the swamps of Bengal, from cities, from forests, and from over the ocean. Dr. Mitchell says no analysis of malarious atmosphere has revealed any defect of its elements, or of its impouderahle constituents. Yet there is eomething generated in swamps and marshy land, in warm climates, that mingles with the air, which, when breathed or ahsorbed hy man and some other animals, is the cause of disease. Tbis something is called miasma.

What is Miasma?

Chemical analysis has heen unahle, as yet, to tell what it is. It does not even yield a hiut as to whether it is animal, vegetahle, or gaseous. The late Dr. John K. Mitchell, of Philadelphia, in a treatise on malarious fevers, gives the following various theories that have been held and advocated by physicians as to the nature of miasma. First, that it is a poison due to the decomposition of vegetable remains in low, wet places. Second, that the mephitic vapors of marshes only enfeeble health, and tbus enable the ohvious changes of heat and moisture to excite disease. Third, that all cases of periodical disease are due to seusible changes, and that the proximity of a marsh is only efficient as presenting an evaporating surface, hy which the air is made colder and damper. Fourth, that the morbid phenomena is due to the modification of the sensible and appreciable condition of the atmosphere. Fifth, lessened elasticity of the atmosphere. Sixth, particular gases generated by decaying vegetation. Seventh, the action of water on living vegetation; and eighth, the theory advocated hy Dr. Mitchell, and held hy that large class of eminent physicians who hold the proofs to he conclusive in favor of the germ theory as the cause of many diseases. They believe miasma to consist of the spores of a minute fungoid growth, which finds its home on moist decaying vegetation, and that these spores, when breathed and taken into the human eystem, are capable of subsequent multiplication, to the ohstruction of the vital functions. Dr. J. H. Salisbury, of Cleveland, Ohio, thinks he has discovered this microscopic fungus, which, he says, is one or more of the palmallæ. He has made a record of instances where he caueed earth, in which this microscopic plant was ripening, to he taken in hoxee and placed in the windows of the sleeping rooms of pereons residing in a non-malarious district. The air entering the cbamber was caused to pass over this earth. In from 10 to 15 days, the occupants of the chamber were attacked with ague. Similar experimeuts, with like results, have been repeated in Germany. The advocates of the theory that miasma is due to the decomposition of vegetahle remains—notahly Dr. H. W. Harkness—urge in reply to Dr. Salisbury's experiments, that no means wae fouud to separate the spores of the palmella from the gasee and emanations of the earth in which the plante grew. Dr. Harkness also urges, in a paper on the euhject, that the palmellæ grow ahundantly in regions where malaria is not known, where the temperature is so low that malaria cannot exist, that they have been found growing at an elevation of 15,000 feet in the ice-cold water that tricklee from the glaciers of the Himalaya, as well as among the iceherge of Greenland.

The advocates of the germ tbeory urge, that the failure of the chemist to detect miasma by his tests, delicate as they are, ie to he ascribed to the fact that it is organic and composed of few elements, which elements are, in a great part, those of the atmosphere itself, and that they produce no distinctive reactions under the ordiuary processes of analyeis.

If we avoid the discussion of tbese theories and leave the chemist confessing that, as yet, he cannot tell what miaema ie, but aek what facts bave heen noted and recorded in relation to it, we ohtain the reeults of a vast amount of ohservations as to how it originates, as to the conditione necessary for its generation, as to how it is transported and disseminated, and as to its effects on the human syetem, and how these are counteracted. These last I do not dare to discuss, but I will try and condense euch other facte as have been observed, and to the correctness of which there appears to be universal agreement.

Origin and Dissemination of Miasma.

Rich, moist, prolific land, with decaying vegetation, in a climate like that of portions of the interior of California, will produce miasma; and the more favorable the conditions for vigorous and abundant growth and consequent ahundance of vegetation to decay, the larger the amount of miasma generated or given off. Such lands will always be sought hecause profitable for cultivation, notwithstanding the penalty attached to residing upon them. This penalty may he mitigated or perhaps avoided by a knowledge of what has heen observed of the laws governing this cause of disease. If a condensed statement of these observations—for all of which I am indehted to the records of many scientific and medical observers—will be of service iu showing farmers and others living in malarious regions, where they should build their homes and how best to avoid the iufluence of this mysterioue scourge, my purpose iu writing this paper will have heen accomplished.

For the generation of miasma there are required heat, moisture, and decaying or decayed vegetation. The absence of either prevents its development. The heat necessary for its formation must be above 60° Fah., as it does not prevail in regions where the daily average temperature is helow 60°. It therefore does not prevail, as a cause of disease, in high latitudes or on elevated mountains. Heat alone will not produce it, as it is not known in hot sandy deserts. The most favorahle situations for its production are a daily average temperature of over 60° and a moist alluvial soil rich in humus, lying on a clay suhsoil. Iu this temperature it is largely generated where the hottom of a sluggish etream, or the hottom of a pond or reservoir is exposed to the hot sun. It does not appear to he geuerated on land that is clean, dry and well drained. Continuous cultivation of the soil, it is thought, prevents its formation. The drainage of low marshy ground slowly expels it, but the drying up of an inundation usually reproduces it where it had previously existed. At an unascertained temperature helow 60° it is heavier than the ordinary air at the same temperature; at an unascertaiued temperature above 60° it is lighter than the air at the same temperature. In other words, it is condensed by cold, made heavier and falls to the ground, and it is rarefied hy heat and ascends. Free rapid ventilation appeare to dissipate it, while it is concentrated in stagnant air. It is more pernicious at night than duriug the day, because concentrated by the cooler temperature, and for the same reason more pernicious near the ground than at higher elevations. The upper stories of houses are more exempt from it than those near the ground. At night being heavier than the air it clings to the earth and is moved hy the wind, rolling aloug the surface like a low fog. In this way it ascends a slightly sloping surface, but is banked up against a hill, levee or more ahrupt ohstruction. For this reason persons living on the windward side of a levee, a grove of treee or a hill, are more suhject to its influence than those living on the opposite side. Prof. John W. Foster, in his work on the Mississippi Valley, states that the early settlers of Illinois when first subduing the prairie to cultivation found it necessary to build their cabins on the windward side of the land to be cultivated.

Empedocles, 400 years before our era, found it possible to destroy or impede the action of malaria, in one instance hy draining a swamp, and in another by building a high wall to protect an exposed town. It has been observed where our mining reservoire have heen emptied in summer and the deposit remaining has been exposed to a hot sun, that the people living on the eastern side of these reeervoirs were more affected hy it than those living on the opposite eide, our prevailing winde in summer being from the weet. While the reeervoirs are kept full of water, or while lands are kept flooded, miasma does not appear to he produced. It either does not form or the water absorbs it. It is thought not to be generated or at leaet not to rise through a foot or more of water. Dr. W. W. Hall, of New York, who devoted much time to the observing and recording of facts connected with vegetahle miasma, thinks that it is ahsorbed hy water and that the wind will not convey it across a wide and rapid stream. Thie is doubted by other authorities. It has, however, beeu repeatedly noted that while it prevailed on a shore producing much sickness, people in vessels anchored a mile from the shore were not attacked. It is probahly ahsorbed by stagnant water where it is generated, hut does not thereby lose its malignant qualities. Of the numeroue observatione which appear to confirm this view, I eelect one recorded hy Boudin in the *Lancet*. Three vessels sailed from Algiers for Marseilles transporting 800 soldiere, who on shore had all heen exposed to the same atmoepheric conditions. Two of the vessels had heen supplied with good water, the third with water from a marsh. The two former arrived at Marseilles without a sick man, the third ehip lost 13 men and had 120 sick, 98 of whom were afflicted with malaria.

If possible, a house should not he built on made land, over a filling, ou hottom land, on land once the hed of a stream, elough or pond where leaves, grass, wood or other vegetable matter have heen deposited and decayed. If not possible to avoid such situations, then the bouse should he on a mound with free ventilation beneath, and all sleeping roome sbould be in the upper story. Of couree water from shallow wells or stagnant sloughs in such situations sbould not be used for domestic purposes. In the neighborhood of shallow ponds and sluggish or stagnant water, it has been noted that malarious diseases would prevail in an ordinary season, while the inhabitants would escape in both a very wet and a very dry season. This appears to be explained by what has been stated. In the very wet season the ground was covered hy water, and the miasma was uot generated, or did not rise; iu the very dry season the moisture was not there, and it cannot be produced in dry earth While miasma is given off by decaying vegetation it is absorbed or arrested by growing vegetation. No other fact seems to be eo universally conceded as this. Priuitive forests, when left to the undisturbed operations of nature, preserve the halauce between growth and decay, and do uot largely generate it. It does not prevail in the bogs of Ireland, nor in the Dismal swamp of Virginia and North Carolina, while their surfaces are covered hy perpetually growing mosses and other vegetation.

The Influence of Forests.

In a paper on the forest trees of Australia, hy Mr. Bosisto, read before the Royal Society of Victoria, and puhlished in the official catalogue of the Commissioners to tbe Centennial exposition for Australia, he says four-fifths of the vegetation of Australia consists of forests of eucalyptus; and as to the sanitary influence of the forests of this family of trees, he adds: "Australia, on the whole, may be said to he pretty free from virulent endemic or miasmatic fevers, and the latter may be said to exist, only as the eucalyptus recedes."

When forests are cut down and the balance destroyed hetween growth and decay, the means provided hy nature for the absorption of miasma are removed, aud it is left free to poison the air. As has been well stated by Dr. Mitchell, in his essays on malarious fevers, "the insalubrity of a place has the most constant relation to the habits of the living vegetation." This law cannot be hetter illustrated than in the history of the Campagna near Rome. At the commencement of the Christian era it was covered with forests of trees, gardens and villas. On it were erected the magnificent villas of the Emperors Domitian and Hadrian. Pliny, in writing of it during the reign of Vespaciau, A. D. 75, says: "Such is the happy and beautiful amenity of tbe Campagna that it seems to be the work of rejoicing nature. For truly so it appears in the vital and perennial salubrity of its atmosphere, in its fertile plains, sunny hills, healthy woods, tbick groves, rich varieties of trees, breezy mountains, fertility in fruits, vines and olives, its noble flocks of sheep, abundant herds of cattle, numerous lakes and wealth of rivers and streams pouring in upon it." The effect of the destruction of the trees in ehanging this paradisc to a pestilential desert is observed by every traveler. It is now so terribly stricken by malaria that beyond the Church of St. Paul, ahout two miles from tho walls of Rome, I could not see a human habitation to hreak the utter solitude. The people who cultivate small portious of it, go down from the hills cach day, long after the sun has risen, do their work in the heat of the day, and escape hack to the hills again before the sun has set. In describiug the Church of St. Paul, near the Three Fountains in the Campagna, Mrs. Jameson says: "In all the melancholy vicinity of Rome there is not a more melancholy spot than this. A splendid monastery, rich with all the offerings of Christendom, once existed here. The ravages of that myeterious scourge of the Campagna, the malaria, have rendered it a desert. Three ancient churches and eome ruins still exist, and a few pale monks wander about the dismal confines of the hollow in which they etand. In winter you approach them through a quagmire; in summer you dare not hreath in their pestilential vicinity."

The French Investigations.

M. Becquerel, memher of the French Inetitute, in a paper ou "Forests and their Climatic Influence," puhlished in 1867, in giving the effects of the destruction of forests in different parts of France, says: "La Brenne, situated between the Indre and the Creuse, presents a circular surface of more than 125 milee in circumference, or nearly 197,680 acrcs. The eoil is sandy loam resting on a substratum of impenetrable clay, which resists the infiltration of water. It is thickly covered with pools, to which are attributed the intermittent fevers prevalent throughout the district. Ten or twelve centuries ago it was occupied by foreets interspersed hy meadowe and watered by running streams and eprings. Then there existed neither pools nor swamps, and it wae renowned for the fertility of its pastures and the amenity of ite climate. A like state of things appear in Sologne, which represente a surface of 1,112,000 acres, and which hae become proverhial for its insalubrity. The deplorable condition in which we eee it did not always exist. Historical documente show that a great part of this country was of old dotted with woods. Their extirpation has been succeeded by the accumulation of etagnant water, fevers and the atteudant maladies."

In a report to the French government on the waters and foreets of France, made in 1875, the tbe author records the fact that at Palo, a railroad etation between Civita Vecchia and Rome, a piece of woods had stood between this place and a malarious district to the south, and while this remained the place was healthy. This was cut down and presently the south winde brought in the fevers from the pestilential district. Manziana, a place that had been almost wholly free from malaria, suffered in like manner after some shepherds eet fire to an olive forest adjacent. A similar phenomena was observed at Sezze. He adds: "At Supino, the arondissement of Frosinone, formerly passed for healthy, but since the cuttiug off of a piece of woods, the malaria soon became seated, and in a little time many of the inhahitants fell victims to the disease.

Other Official Reports.

A forest of pines existed in the Campagna as late as 1580. It having become tbe stronghold of brigands, it was ordered destroyed by Pope Gregory, XIII. Lancisi records that after its destruction the insalubrity of Rome was notably increased. The island of Mauritius was once covered with dense forests, and was noted for its salubrity. Since 1851 these have been destroyed for their wood, and that the land might be made profitable in the cultivation of sugar cane. The effect of this destruction of trees is given in a letter of Mr. Charles Meldrum, the director of the observatory of Mauritius, to Mr. F. B. Hough, dated August 16th, 1877, and published in his report on forestry for tbat year Mr. Meldrum says: "Formerly, when the interior was densely wooded, a large portion of the rain water was retained, and filtration went on gradually, so that, even in the driest years, the lagoons received regular supplies of pure water, hut uow the greater part of the rain water is carried away to the sea, and hence in dry weather the sun'e rays beat down on slimy, fetid marshes. During torrential rains also the low lands are flooded, and mucb stagnant water and vegetable debris are left behind. The consequence is, that an island, at one time noted for its salubrity, has become a hot-bed of malaria. During the last 10 years the mortality from fever has heen very great. It is during the process of evaporation after heavy rains that the fever becomes epidemic, and only then with a high temperature."

In the Freuch report ou "Waters and Forests," for 1877, in referring to the climate of the city of Guatemala it is stated, that eince the forests whicb existed between that place and San Jose—its port on tbe Pacific—have disappeared, the inhabitants have been exposed to miasma generated on the coast, and new diseases have appeared.

Dr. Bryden, President of the Statistical Office, of Calcutta, in his report of 1869, on epidemic cholera in the Bengal Presidency, says: "Tbe road to Sambalpoor runs for 60 to 70 miles through the forest, which, around Petorah and Jenkfuss, is very dense. Now it is a remarkable fact, hut it is a fact nevertheless, that on this route traversed daily by hundreds of travelers, vehicles and baggage trains, the cholera rarely appears in this extent of 60 miles, and when it does appear it ie in a mild form; hut wben we come to the road from Arang, westward to Chicholee Bungalow, wbich runs for about 90 miles through a barren, treeless plain, we find the cholera every year in its most severe form, the dead and dying lying by the wayside, and trains of vehicles half of whose conductore are dead." Dr. Murray, inspector of the hospitals in the Beugal Presidency, is his report for the same year, gives a number of instances of the influence of trees in preventing the spread of cholera. He says: "In India the fact ie generally believed, and not long ago the medical officer of Jatisgar, in central India, offered a striking proof of it. During the widespread epidemic of cholera in Allahabad in 1859, those parts of the garrison wbose harracks had the advantage of having trees near them, enjoyed an indisputable exemption, and precisely in proportion to the thickness and nearness of the shelter. Thus the Europcan cavalry, in the Wellington barracks, which etand between four rowe of mango trcee, but are yet to a certain extent open, euffered much leee than the fourtb European regiment, whoee quarters were on a hill expoeed to the full force of the wind; while the Bengal horee artillery, who were in a thicket of mango trees, had not a single case of sickness; and the exemption cannot be regarded as accidental, as the next year the comparative immuuity was precieely the eame."

M. Regaud de l'Iele was one of the savans who was eent to Rome in 1810 to investigate the practicability of the drainage of the Pontine marshes. He made au extended report entitled "Causes of the Insalubrity of Air," published in 1816. In that portion relating to the effect of forests, he eays: "When a current of had air, laden with pestilential miasma, penetratee a foreet to a certain extent, it is wholly deprived of these propertiee. The effect of this is observed in the Pontine marshes in which a belt of trees preserve all that is hehind it, while tbe uncovered part is exposed to fevers. The trees therefore tame the infected air and deprive it of its miasma."

Within the past few years some plantations of treee bave been made with the object of improving the eanitary condition of particular localities, notahly near Rome and in Algeria. The evidence of tbe beneficial effcct of thie planting is now beginning to accumulate. In 1874 plantations of the eucalyptue were made ahout the church of St. Paul and the abbey of the Three Fountaine near Rome, which, ae bas heretofore been stated, is one of the most inealubrious and fever-breeding portions of the Cam-

pagna. For the past four years the sanitary condition of its few inhabitants has so much improved that the experiment is considered successful, and the Italian government is extending similar plantations about other fever-stricken localities. From Algiers a report has been made of a military post in which the garrison had to be changed every five days, so virulent was the malaria. A plantation about the post of 60,000 trees of the eucalyptus, has nearly absorbed or arrested the miasma, and rendered unnecessary the frequent changes of the garrison. Parts of the island of Cyprus are so afflicted with malaria, that Sir Garnet Wolseley has asked the English government for an appropriation of £3,000, to be expended in plantations of the eucalyptus about the military posts, and especially near the salt lakes of Larnica.

The commission appointed by the Italian government to report on the means to be adopted for the improvement of the extensive swamps known as the Tuscan Maremme, advised the planting of three or four rows of poplars in such directions as to obstruct the currents of air from malarious localities, and thus intercept a great portion of the pernicious exhalations.

American Experience.

It has been a popular belief in many of the Western States, that the planting of sunflowers about a house, would preserve its inhabitants from miasma. The attention of Lisut. Manry having been called to the subject, he caused several rows to be planted between the Washington observatory and the marshy banks of the Potomac. He has recorded his belief in the fact, that while they were growing, they saved the inmates from the intermittent fevers to which they had been formerly liable. George P. Marsh states that "Maury's experiments have been repeated in Italy, and large plantations of sunflowers have been made upon the alluvial deposits of the Oglio above its entrance into the Lake of Iseo near Pisogne, and it is said with favorable results to the health of the neighborhood."

Delano is a station on the Southern Pacific railroad on the treeless plains of Tulare valley, the nearest station to Tulare lake, and under the direct influence of the prevailing winds that blow, during the summer and autumn, from over the extensive marshes made by Buenavista and Kern river sloughs, before their waters are drained into the lake. During the construction of the railroad and for some years afterwards—relatively to the number employed—more men afflicted with malarious diseases were sent to the railroad hospital at Sacramento from this station than from any other point on the road. In the spring of 1876, the Directors ordered 1,000 of the eucalyptus globulus to be planted in a tripple row near the railroad track between the station and the marshes. These have grown rapidly, and now average more than 25 feet in hight. The yearly average of patients sent to the hospital, with malarious diseases, from this station from 1873 to 1877, was about 25. In 1878 it was reduced to eight. Mr. R. Forbes, who has charge of the records of the railroad hospital, in writing me as to the sanitary condition of different stations on the road, says: "The health of the men all along the line appears to be much improved during the last two years, which is probably due somewhat to the culture of blue gum trees." For the purpose of obtaining statistics of the health of the inhabitants of the village, who were not employees of the railroad, the engineer's department wrote to Mr. Defos du Bau, an extensive wool grower at Delano, who employs many men. In his replies he says: "The population of Delano is nearly 50 persons, but it increases to more than double in March and April, August and September. At these two periods we employ 50 men in our corrals. Intermittent fevers commence in autumn and continue a part of the winter. In 1874 and 1875, with two exceptions, everyone had fever. In 1876 it was the same thing. Out of 45 men employed at the corral, fifteen shearers were taken sick, 48 hours after we had a sand storm caused by a southern wind, and the others were attacked the following day. In 1877 there were but three or four cases amongst our people, and seven or eight among the floating population. In the year 1878 there has been no sickness from intermittent fever. We attribute this change to the trees you have planted, and to those which we ourselves have also planted."

Conclusions from Facts Cited.

From this collection of facts it appears to be clear that while miasma is given off by decaying vegetation, it is also absorbed or arrested by growing vegetation. In temperate climates intermittent fevers do not usually prevail until autumn, about the period when deciduous trees are shedding their leaves and lower forms of vegetation have ripened their seeds and cease to make growth. The eucalyptus globulus has earned the name in the south of Europe and northern Africa of "the fever tree," from its supposed virtues in preventing malarious diseases. Its beneficial effects in this respect I think are to be ascribed not to its odors or resinous gum, but to the fact that it is a broad-leafed evergreen, that it has nearly an equal number of stomata on each side of the leaf, that it is absorbing moisture by the roots, transpiring by its leaves and its chlorophyl is changing sap into woody fiber, when deciduous trees are inert. In other words, it continues to grow after deciduous trees and annual plants have ceased. Prof. Lockwood says it is asserted that a eucalyptus will eliminate from a swampy soil and transpire eight times its own weight of water in 24 hours. All trees arrest or absorb miasma while growing, but the eucalyptus never stops growing in our climate, and therefore its work in this respect never ceases. It is not remarkable for beauty of form, but it is wonderful in its rapidity of growth, has much commercial value for its wood, and for arresting or absorbing miasma, fills a place that cannot be so beneficially occupied by any other tree within my knowledge.

From what has been stated it will be seen how great is the benefit to be derived from the planting of forest trees, and how great is the crime in the wanton and needless destruction of the trees on the borders of our rivers, sloughs and over-flowed lands, and the certain penalty that follows this crime. Without looking to the ultimate effect of the destructive waste of trees on our mountains, hills and plains in altering climate and in creating floods and drouths, but only to the sanitary effect of this waste, I sympathize with wise and good Bernard Palissy, who in 1563 thus complained: "When I consider the value of the least clump of trees, or even of thorns, I much marvel at the great ignorance of men who, as it seemeth, do nowadays study to break down, fell and waste the fair forests which nature did guard so choicely. I would think no evil of them for cutting down the woods did they but replant again some part of them; but they care naught for the time to come, neither reck they of the great damages they do to their children which shall come after them."

Useful Information.

Grape Seed Oil.

Has this ever been made in this State? It seems that Italy and France are getting nervous about the 17,000,000 pounds of grape seed which they are annually throwing away, and in a country which pursues the economies as closely as France, it is no wonder this great leak excites attention. We read that a process has recently been adopted in Europe by which oil is profitably extracted from the grape seeds thrown out at the wineries. The first step in the process is the careful drying of the seeds. Those of the black grape appear to be the best for the purpose in view, the white grape seeds containing a far less proportion of oil. They are then carefully washed free from dirt and mold, again dried, and ground in a mill in the ordinary manner. It is necessary that the meal should be extremely fine, for experience has shown that on this point the quantity of oil obtained from it is chiefly dependent. The meal is then put in large coppers, and a hole scooped in the middle of it with the hand and filled up with water; after which a slow fire is lighted under the caldrons, and their contents stirred about from time to time so as to ensure the perfect mixture of the meal with the water. The fire is withdrawn when the heat has risen to such a point that the hand can no longer be borne in the coppers, and the paste taken to the press in sacks. It will be seen that the process is of the most simple nature, and can be applied with very little outlay in localities where the plant of presses and other apparatus is already at hand for treatment of the olive crop; but even when this is not the case, the extraction of the oil would probably prove fairly remunerative. It is calculated that every hundred pounds of the seeds will yield five or five and one-half pounds of oil. The latter is of a light yellow color, and mild flavor, and without smell. Its specific gravity at 15° C. is 0.9202, and it solidifies at 16° C. The value of the oil on the market is about twice the cost of its extraction, as it is done by the French. It will probably be used as another of the many adulterants of French olive oil, which is sold to us at such high price. Whether grape-seed oil would pay in this State, is doubtful, but it might be tried as a matter of interest.

A new application of the Bessemer process, the invention of Mr. John Holloway, is described in our English exchanges, by which the converter is used to treat iron and copper pyrites, and produce sulphurous and sulphuric acids, and a regulus containing copper. The pyrites are melted in a cupola, and then blown with a blast of air in a Bessemer converter. The sulpur is oxidized into sulphurous acid, which can be dissolved, condensed or further oxidized into sulphuric acid. A rich regulus is obtained, which can be profitably treated for copper, the slag being highly ferruginous, as in the present system of copper smelting. As in the Bessemer steel process, the carbon and silicon in the molten pig iron are the fuels which furnish the heat required in the process; in the new process the sulphur in the pyrites (a more combustible material than carbon) is the fuel. It is said that the new process would avoid the destruction of vegetation which is complained of in localities where pyrites are treated for sulphuric acid.

Making Plaster Set Quickly or Slowly.—In order to make plaster set quickly, mix it with warm water into which a little sulphate of potash has been dissolved. To make it set slowly, mix it with fine slacked lime. The time of setting may be regulated by changing the relative quantities.

Elevation and Temperature.

Dr. C. D. Hunter, of Santa Rosa, has given much attention to the study of atmospheric and climatic phenomena in different parts of the world. He writes for a recent issue of the Santa Rosa *Democrat* an article to show the philosophy of escapes from frosts at moderate elevations, while valleys below are badly bitten. Although all of us know practically that such is the fact, not all are conversant with the reasons therefor, and as the subject is of interest to many who are intending fruit-growing and the like, we shall present in condensed form the atmospheric performances outlined by Dr. Hunter.

It seems that the first clear demonstration that the valleys were more subject to frost than the hillsides, resulted from the establishment of meteorological stations in Switzerland. There the great hight of the mountains and the narrowness of the valleys show their difference much more markedly, and to as great a hight as 5,000 feet. Santa Rosa valley is so large and wide in comparison to the hight of its surrounding hills, that the difference is neither so marked, nor can it extend to so great a hight. Probably in our smaller valleys, and the great Sacramento valley near the foot of the higher Sierras, will be found many low-lying grounds subject to night frosts even late in the spring season.

The main cause of this peculiarity in the distribution of low temperatures is to be found in the but slight heating effect of the sun's rays on the atmosphere. The sun must first heat the soil, and then the soil heats the air. Conversely the cooling of the air is also effected by the soil; and hence the air nearest the soil is always the hottest when the sun is shining, and the coldest when the sun is absent. For the same reason the surface air experiences the greatest changes of temperature. So it comes that the air of the valleys being hedged in by a surface of soil on every side gets rapidly heated when the sun shines, whereas that of the hills has not only less surface for an equal quantity of air, but it is almost constantly in motion, and each new supply keeps down the temperature of the surface soil and air. The glaciers of the Sierras and the snow-capped peaks of high mountains even in the tropics, bear witness to the fact that the direct rays of the sun have but little power to heat the atmosphere; for otherwise the higher we ascended the warmer it should be.

Few have any idea of the extreme changes of heat experienced by the surface soil. When the maximum thermometer in the air will register 70° or 80°, one on the soil may reach 110° to 130°. But even before the sun sets and as its rays cease to heat the soil, the surface rapidly cools down, and after a calm, clear night it will be found, as a rule, from 4° to 8° colder at sunrise than the air four feet above it. Now, as every one knows, cold air is heavier than hot air, hence what forms in the valley remains there. But what of that on the hill? As the air on the hill cools, it begins, like water, to seek its lowest level, and as the cooling process goes on, every watercourse, ditch and hollow becomes a channel down which the cold air flows just as if it was so much water. Consequently near the foot of the hill every little valley and depression of the surface becomes a little lake of the frosty fluid. Here it accumulates in proportion to the stillness of the night and severity of the frost. At the same time the hill surface as it loses its cold air must get a new supply, and this, of course, can only come from above, where the air of the day, being out of the reach of any solid body to cool it, has lost only a portion of its heat. So by night the soil of the hills is constantly bathed with air of a comparatively mild temperature, whilst the valleys receive of cold far more than their share.

Good Health.

Health.

Editors Press:—I have been a semi-invalid for 50 years. I have been obliged to study the conditions necessary to the preservation of health in order to keep soul and body together so long. I will give, measurably, the results of my studies in this line, hoping thereby to benefit others. I love the true reformers of the age. They are, for the most part, philantbropically laboring for the good of mankind; they see evils, and corruptions, and oppressions everywhere they turn their eyes, and labor manfully to lessen them. But the trouble with far too many of them is that they labor *too* assiduously; they go *too* far with their ideas of reform; they ride their respective hobbies to death, and often do more harm than good in the world. Now, my hobby, if I have a hobby, can, I think, be expressed in two words—

Avoid Extremes.

The reformer in theology, seeing priestcraft and error in all creeds and sects, too often strikes at the root of all religion, and would leave us nothing but poor, fallen human nature to depend upon. The reformer in social life, seeing oppression, and tyranny, and corruption in all laws and their administration, is too apt to denounce all order, and law and government, and advocate a system which would inevitably result in anarchy and indiscriminate bloodshed. The reformer in medicine, seeing that drugs kill as well as cure, will sometimes strike loose from all medicine and depend entirely upon unaided nature to affect a cure. These all go to extremes. The happy healing medium is not sought. The old-time doctor denies a drop of water to his fever-burned patient; the hydropathist sometimes drenches him with ice-cold draughts, and soaks him in cold water until all color, and vigor, and life are drenched out of him. The happy medium would be to give him moderately of cold water when he was dry, and bathe him for a few moments in cold, or cool water, when his skin was hot. It is a good rule in these, and many other cases, to do and act in a manner that will make the patient most comfortable, with an honest, intelligent physician to modify somewhat upon occasions, this rule. Pepper and lobelia are good medicines, but I have seen, in the infancy of Thompsonianism, a man pour a heaping teaspoonful of fiery cayenne pepper into his bowl of bread and milk and eat it, when there was nothing the matter with him; and I have heard of taking a lobelia emetic to cure a sore toe. The allopathist will sometimes feed quinine like flour; and the homœpathist, taking warning, perhaps, from the evil effects, will sometimes reduce his dose so a mosquito need not fear to swallow it. There is, doubtless, good in all these various systems, but, carried to extremes, evil results.

Old Truths Good Enough.

Now, I do not expect to add anything new; old truths are good enough, and there are enough of them; the trouble is they are too often neglected or forgotten. The less drugs the better. Take them only when absolutely necessary, and only as prescribed by an upright physician, and then only in the smallest possible doses. They are so uncertain in their effects. Indeed, some noted physicians go so far as to say that drugs have done more harm than good in the world. They are too apt, even when they cure disease, to leave the system in that enfeebled state that some other and more malignant disease will seize upon the patient, when a series of circumstances renders him peculiarly liable. Better, perhaps, to be sick a few days longer, and let nature finally heal, and heal truly, than to cure with drugs, the deleterious effects of which remain for years, or for life, to torment.

Eat Wholesome Food.

Eat the most wholesome and the best cooked food to be obtained. This does not mean what is usually called the richest. The plainer the dish the better, so that it is *good*. It must also *taste* good. If the appetite is perverted with highly seasoned dishes, it should be corrected as speedily as possible by persisteutly eating plainer dishes. It can soon and easily be done. Have a large variety, eat everything that is good, but not at one meal. Here let the smallest number of dishes that will properly satisfy the appetite, suffice. Use very few condiments, and spices, and seasonings. Eat slowly, masticate thoroughly; enjoy your meal to the utmost, but never eat to repletion. Have pleasant subjects for conversation; keep all excitements and passions from the table. Indeed, passions at all times kill, especially the invalid. Keep cool and happy. Bathe once a week—oftener in hot and dusty weather—in warm or cool water, whichever is most agreeable to the sensations. Bathing, followed by a permaneut chill, is death-producing.

Follow Nature,

But here reason must step in, for nature is sometimes perverted. Be very regular in all your habits, regular in lying down and in rising up, regular in eating, and drinking, and sleeping, and be especially careful not to get into the habit of eating between meals. "Let your moderation be known" in all things. Be moderate in eating, in sleeping, in drinking, in labor and in rest. If you have labored hard and are hot and thirsty, drink moderately; if you are very hungry, eat very slowly and very moderately. If meat agrees with you, eat a little; if you are old or feeble, drink a little tea or coffee; if you need stimulants, drink a little wine; but of most of these, I would say, the less the better, and of whisky and tobacco, I would say none. I end with the refrain which I would impress most earnestly upon all, *avoid extremes;* do nothing to excess; and if you have, in a moment of thoughtlessness, overdone, physically, or morally, or mentally, lie idle for a few days and recuperate, and do not, unless you are seriously sick, throw yourself into the hands of a physician, who cannot know your nature as well as you ought to know it yourself.

S. P. Snow.

Tape-Worm in Cucumbers.—The dietetic reputation of cucumbers is bad enough already, but it is likely to become worse, now that Dr. Leidy, of Philadelphia, has discovered that they are liable to be infested with tape-worm. At a meeting of the Academy of Science, Philadelphia, he exhibited a specimen of tape-worm taken from the inside of a large cucumber. It is said to have had all the characteristics of a true tape-worm, but belonged to an unknown species, the peculiarity being that the ovaries, containing the round yellow eggs, are confined to the anterior extremity of the segment.

MINING AND SCIENTIFIC PRESS.

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The Week.

As a whole the mining communities of California have been well prospered so far this season. Water is plenty, and the gold mines continue to yield without abatement. The gold product both from quartz and placer diggings bids fair to be large beyond precedent, and the whole mining population are working with the evident intention of making the most of the opportunity while it lasts. A heavy mining suit has been commenced against the Trustees of the Alta Mining Co., on account of a missing item of $250,000 in their accounts. The agreement between the mining companies and the Sutro Tunnel, is now positively stated to have been signed. The contract is substantially the acceptance of the old agreement of 1866, subject to modifications, principal among which is a reduction of the royalty of $2 per ton to $1 per ton on ores that yield $40 and less per ton; while on ores that yield more than $40 per ton the royalty is to be the same as before—$2 per ton. The officers of the mines are required to furnish the Sutro Tunnel Co. a certified statement of the yield of each mine, and to pay the royalty on the same on the 10th of each month for the product of said mine during the calendar month. The mining companies are to advance the tunnel company $70 per linear foot, without interest, for the construction of branch lateral drifts north and south connecting with said tunnel. The tunnel company is to repay this advance at a future time. The mining companies will be permitted to assist in the construction of the lateral branches, and for all work thus done the tunnel company is to repay the mining companies at the rate of $70 per linear foot. It is also provided that the tunnel company shall have the tunnel in readiness for the free passage of water of whatsoever temperature drained from the mines, and that the latter shall be at liberty to pump the same at the expiration of 90 days from the signing of the articles, or at any time within that period when the tunnel company shall give consent. The payments to the tunnel company for the work it performe in running the branch lateral drifts are to be made on the 5th of each month at the above rate ($70 per linear foot) for the number of feet run within the preceding calendar month. The Sutro Tunnel Company has for several days been preparing to resume work in the tunnel. A thousand men will be taken on to dig the sub-drain.

What is Being Done in the Mines.

The business of mining throughout most parts of California is just now in a very active and prosperous condition. This industry seems to be, in fact, making satisfactory progress in nearly all parts of our Pacific States and Territories. From every quarter the accounts that come to hand are of a cheerful tenor, the productive mines yielding their full complement of bullion and many new finds of importance being reported. While so much activity and such generally good results are everywhere noticeable, the business of gold mining is at the present time especially lively in California, where at this season of the year it can be pursued to best advantage. This is harvest time with our hydraulic miners, who reap while our farmers are plauting. On this class of claims gravel washing is now being pushed diligently day and night and will so be continued without intermission, except through accidental interruption or for the purpose of cleaning up, till the end of the water season, which promises to be much more extended than the miners had for a long time dared hope for, and may even be as protracted as in ordinary years, despite the dry winter.

There is reported to be a pretty fair stock of snow on the mountains, a good deal having fallen during the recent storms. As these later additions are underlaid by a considerable body of more compact snow, the whole will be likely to keep the streams tolerably well replenished till mid-summer or later. For several weeks past this class of miners have almost everywhere had plenty of water, and, as the weather has meantime been warm, they have been able to run to good advantage. A great deal of gold has already been taken out, and should the season continue favorable a large production may be counted on from this source the present year. It is not expected that the amount of gold gathered by this process will hereafter undergo any rapid expansion. The quantity of water available for washing having been about all appropriated and applied to that purpose, there is left little chance for enlarging the bullion product, which can now only be increased through enlarged water catchment and storage, which has also about reached its greatest practicable limit. The owners of these properties have, however, through the construction of additional reservoirs and ditches and the introduction of more perfect apparatus and powerful explosives, brought the whole to a condition of such efficiency that they will be able to maintain the present rates of production for a long time to come, and may, through some increment of water supply, be able to add somewhat to the yearly aggregate product now turned out.

Besides the hydraulic washings, the late copious rains have imparted new life to certain other branches of placer mining, a good deal of which is now being done in the shallow diggings and dry ravines, where operations can be carried on at such times only as the present, when water is furnished to them by the rains and without cost. In some of these localities there still remains a good deal of auriferous ground, and as the present tolerably full and long continued water supply has been taken advantage of to work them extensively, these usually non-productive placers will contribute materially towards swelling the bullion stock of the current year. One good feature of these dry diggings consists in the fact that they remain for the most part unclaimed, and requiring but little outlay for tools and equipment and nothing for water, can be profitably worked by men of small means; many of whom in favorable seasons like the present repair to these spots and for several months earn satisfactory wages. As they can be worked but for short periods at a time and often only at long intervals, these fruitful patches will hold out for a long while—a refuge for the industrious dead-broke—a sort of placer preserve for the poor man.

The drift claims already opened are yielding liberally, and much new ground is in process of exploration and development. About Damascus and elsewhere along the Forest Hill divide new tunnels are being driven and new shafts put down to reach the old pliocene channel that passes through that region of country, and which wherever worked has been found prolific in gold. As some of these works have now about reached their objective points, it may be expected that they will soon begin to reimburse expenditures made on their account, and finally earn large profits for the owners. In different parts of Sierra county mines of this class are being operated with excellent results, much prospecting being also done.

In California our mines, by reason of the varied character of this industry, may be said to be always in bonanza. What, between hydraulic, vein, drift and our other forms of mining we are at all times able to accomplish, bullion production goes on steadily and without ever experiencing any entire cessation. We are always gathering gold at some point and by some process or another. And it will here always be so, our quartz reefs, and gravel banks and dead rivers affording inexhaustible deposits of gold-bearing material, to say nothing of new sources likely yet to be opened up and our silver mines destined soon to come in as an additional bullion-making factors. The stranger or casual observer visiting now our mountain towns would get the impression that they were without business and almost without population. Few men would be seen upon the streets or about the saloons and other public places. There would be an apparent dullness and absence of hustle denoting anything but an active and prosperous condition of things. But the eye of the experienced observer would see in all this the evidence of thrift and good times for all, knowing well that the miners, upon whose success all are dependent, were busy in their claims, improving the opportunities now afforded for washing the gold-bearing gravel to the utmost. In these mining districts a town swarming with people is significant of empty pockets, long credits and hard times, while a general cleaning out of the place points to an opposite condition of affairs.

Reading the Stars to a Bad Purpose.

The world has never been without its Cassandrias, and just now it is having a surfeit of these ill-foreboding prophets. Sometimes these people of evil omen come forth to cast the world's horoscope in the name of science, and sometimes in the character of biblical interpreters. As many as three or four times within the recollection of those now living the Millerites or Second Adventists have fixed the time for the world's final destruction, their predictions being based upon the peculiar expositions given of various passages in Scripture. Twenty years ago the past winter the appearance of a comet inspired a widespread terror, certain pretenders to astronomical knowledge having given out that the annihilation of the earth by this celestial tramp was a thing quite within the limits of possibility. And now the approaching conjunction of certain planets affords this same class of pretenders an opportunity to ventilate their learning and inspire the ignorant, the superstitious and the emotional with a dread of impending evils at the same time. Opportunities of this kind occurring only at such long intervals are not to be neglected by these sensation mongers. Hence we find they are being turned by this class to good account.

We are told that the direst calamities await only the coincidence of these heavenly bodies to be precipitated upon our doomed world and race. Next year the four great planets—Jupiter, Uranus, Neptune and Saturn—will be in perihelion—will have reached their nearest approach to the sun, and then evils countless and unspeakable are to be let loose upon the world. The influence of these planets when brought into that position will be, we are assured, exceedingly pernicious to the earth and the people upon it. Indeed, some of these great members of the solar system exert, it would seem, at all times a baneful influence upon our little planet—entertain, as it were, a grudge against it. All these heavenly bodies except Jupiter are unfriendly to us—are, to use the language of astrology, *malefic:* Jupiter alone is *benefic*—kindly and well disposed towards us. But this will not avail to save us from these threatened evils; for, although he is much the largest member of this planetary quartet, his beneficent influence will be nullified by the much greater power for evil possessed by his associates; and which, when the whole set are brought in perihelion, they will be able to exert with deadly effect.

Having so obtained the mastery, the influence of these unpropitious planets will begin to manifest itself in the contamination of our atmosphere, causing widespread famine, pestilence and death. The plague and other incurable diseases will prevail, the waters will become putrid, all nature will be sick. Animals will die, even the fishes will perish and mankind be almost wholly swept from the face of the earth; only on the Pacific coast, where these malign influences are to be exerted with less power, will any considerable number of the human race be spared. As no reason has been assigned by these wise men for this letting up on the inhabitants of the Pacific coast, we are left to infer that this will be due to their greater moral excellence. We find in the case of Lot, of Bible fame, a precedent to justify such conclusion. But even here, we are not to make good our escape altogether. Persons of vile, intemperate and gluttonous habits—who are unclean, eat to excess, drink whisky and suck tobacco, will have a close call, and very likely go the way of the rest of mankind. As a large proportion of our population are addicted to these hurtful and unseemly practices, they, too, may be considered exposed if not doomed to early destruction.

As warrant for these dire predictions our star-gazers, referring to history, find that the world was afflicted in the manner here portended on every occurrence of these planetary conjunctions in the past. Never have these orbs been in perihelion, or even so many as two or three of them, without bringing upon our race these overshadowing disasters. It was so in the year 542, and again 1665, when two of these malignant planets, Mars and Saturn, were coincident; and why should not like conditions now be attended with like effect; or rather, why should not these effects, when there are three of these planets conjoined, be even greater now than then. Shall we not be instructed by history and, admonished by the sad experience of past ages, hasten to adopt such measures as may seem best calculated to protect ourselves against these impending calamities. Nay, they are not merely impending: some of them have arrived; they are beginning to precipitate themselves upon us. In the plague now prevailing in Russia, we have a presage of their early coming, if not tangible evidence of their actual presence. That disease is the *avant courier* of the multitudinous ills with which we shall be visited. It was a godsend, this plague, to these vaticinators of evil. Coming so timely it imparted to their forebodings an air of probability, and has since helped to keep them in countenance with the ignorant and credulous public, if, indeed, its appearance did not suggest to them the idea of assuming the prophetic role as they have done. In the partial diminution of this dread disease these astrological savants must see cause for alarm, as tending to impair confidence in their predictions and so diminish their stock in trade.

The followers of these "star-gazers" are apt to be numerous, including that large class of quid-nuncs, simple and emotional, who love the horrific, believe in signs and consult fortune tellers, who for a small fee are ready to inform them that "it 'pears like" something dreadful, good or bad, is about to happen. These emotionals are fond of the dire and woful, provided always the woes decreed have been allotted not to themselves but to others. Now this proclivity to consult the future and sup on the supernatural and horrible is a constitutional infirmity with many people, and they are not to be blamed for its existence or for seeking ways and means for its gratification. Yet, as it is not a healthful or rational propensity, and its indulgence has a mischievous tendency, it is the duty of the press not to encourage it, nor minister to its indulgence; but, on the contrary, to labor for its suppression, informing these misguided people how little cause there is for alarm.

In the first place it should be remembered how these prognostications about the world coming to an end at a fixed time, and all similar predictions as uttered in our own day, have proved entire failures. Then mankind are prone to believe that the ills, incident to the present time, are peculiar and greatly in excess of those suffered by preceding generations. Hence, the wars and famines, the fires and floods of to-day, are regarded as something, exceptional and pointing to some signal catastrophe in which they are all to culminate. With the astrologer, these multitudinous misfortunes are to reach consummation with the conjunction of the planets. With the religion enthusiast, this will take place on the second coming of the Messiah, with the Aztec when Motezuma returning shall deliver his people from the thrall of the conqueror, and with the Latter Day Saints when Joseph Smith, or some other prophet, reappears on earth in bodily form once more. Now these things are believed in by millions of people, some of whom have been awaiting for these events to transpire for generations and even centuries; and notwithstanding the non-fulfillment of these predictions, their faith in them remains fervid and steadfast.

Difficult as it is to disabuse their minds of these impressions, it is still the duty of all who occupy anything like the position of public teachers to inform this class of persons that there is little or nothing to justify their apprehensions. The truth in regard to these planetary bodies is, that, while they probably always exercise some influence upon the earth and its inhabitants, this influence is exerted through the sun, and is no greater at one time than another. While they are, when in perhelion, nearest the sun, they may be, and generally are, the farthest from the earth, which ought, therefore, to be less affected by them at such time than any other. Now, the sun is so many million times larger than these planets all put together that any effect they can have upon that luminary, even when nearest to it, must be small, indeed. The earth, in making its annual circuit round the sun, comes at some points in its path 3,000,000 miles nearer to that orb than at others, and yet we are not sensibly affected by this greater nearness. Though Jupiter is 12 times larger than our earth, it is composed of matter so much more etherial that its powers of attraction are barely 12 times greater than those of our planet, the power exerted by this force being directly as density and inversely as distance. What is true of Jupiter is true also of Saturn, this disparity between the latter and the earth being still greater. These two are much the largest planets in the solar system, and if their influence upon the sun, and through it upon the earth, is likely to be so little, how infinitesimally small must be the influence so exerted by these lesser planets. So little density have these orbs and such distances are they at all times from the earth that their effects upon the latter must be inappreciably small.

Let, therefore, all who have been alarmed dismiss their fears upon this point. There are plenty of good reason apart from this apprehended scourge why people should take measure for the better preservation of their health, and one would almost feel warranted in terrifying them into some amendment of their present beastly habits, were it not that upon the removal of the cause they would probably relapse, and as an excuse for so much self-abstinence plunge at last into greater excesses than ever. It would, therefore, be as well for the masses perhaps to turn a deaf ear to these portentious forebodings, get rid of their fears and live on as before. The dread of disease, if it do not invite, has a tendency to lay the human system open to its attacks. Excessive fright has been known to bring maladies upon those who would no doubt otherwise have escaped. We have all far less to fear from this approaching conjunction of the planets than from our own excesses and manifold evil habits, which are depopulating the world more rapidly than has ever been done by the Black or any other plague.

New Problems in Mensuration.

[Read before the California Academy of Sciences by Prof. George Davidson, March 3d, 1879.]

The following problems form a continnation of the series commuaicated in part to the *Journal of the Franklin Institute*, in 1866, aud to the California Academy of Sciences, in 1872 and 1873. These, and others to be presented, were completed in 1874, but a pressure of duties has prevented their heing brought to the notico of the Academy.

XIII. Given the height h and the base b of a plano triaagle (Fig. XIII.) todctermine, in terms of the given height and base, the consecutive heights and bases of similar hut hollow triaugles with a central triangle (haviug equal aroas with eaoh other) into which ths given triangle is required to be divided.

To divide the given triangle into n hollow triangles aad central triangle, let h the height, and b the base; x, y, z, etc., the consecutive heights; x', y', z', etc., tbe consecutive hases of the required hollow and central triangles; $(w-1)$ and w the last two heights, and $(w'-1)$ and w' the last two hases; then

$$x^2 = \frac{(n-1)h^2}{n} \quad : \quad x'^2 = \frac{(n-1)b^2}{n}$$

$$y^2 = \frac{(n-2)h^2}{n} \quad : \quad y'^2 = \frac{(n-2)b^2}{n}$$

etc., etc., etc., etc.

$$(w-1)^2 = \frac{2h^2}{n} \quad : \quad (w'-1)^2 = \frac{2b^2}{n}$$

$$w^2 = \frac{h^2}{n} \quad : \quad w'^2 = \frac{b^2}{n}$$

XIV. Given the heights h, h', and the bases b, b', of a hollow triangle with parallel sides (Fig. XIV) to determine in terms of these heights aud hases, the consecutive heights and hases of the similar hollow triangles having equal areas, into which it is required to subdivide the given hollow triangle.

To divide it into n hollow triangles let h' equal the height, and b' equal the hase of the outer triangle; h eqnal the height and b the hase of the inner triangle; x, y, z, etc., the consecutive heights; x' y', z', etc., the consecntive bases (hoth reckoned from h', b'); $(w-1)$ and w the last two heights, and $(w'-1)$ and w', the last two hases; then

$$x^2 = \frac{h'}{b'}\left\{\frac{(n-1)\,b'h' + bh}{n}\right\}$$

$$x'^2 = \frac{b'}{h'}\left\{\frac{(n-1)\,b'h' + bh}{n}\right\}$$

$$y^2 = \frac{h'}{b'}\left\{\frac{(n-2)\,b'h' + 2bh}{n}\right\}$$

$$y'^2 = \frac{b'}{h'}\left\{\frac{(n-2)\,b'h' + 2bh}{n}\right\}$$

etc., etc., etc.

$$(w-1)^2 = \frac{h'}{b'}\left\{\frac{2b'h' + (n-2)\,bh}{n}\right\}$$

$$(w'-1)^2 = \frac{b'}{h'}\left\{\frac{2b'h' + (n-2)\,bh}{n}\right\}$$

$$w^2 = \frac{h'}{b'}\left\{\frac{b'h' + (n-1)\,bh}{n}\right\}$$

$$w'^2 = \frac{b'}{h'}\left\{\frac{b'h + (n-1)\,bh}{n}\right\}$$

XV. Having suh-divided the given hollow triangle, as in prohlem XIV., into any number of similar hollow triangles of equal areas with each othcr, it is required to determine, in terms of the two given heights and hases, the consecutive heights and bases of the required similar hollow triangles formed inside the given hollow triangle, each hollow triangle having equal areas with the given suh-divisions. (Fig. XV.)

Suppose the given hollow triangle is suh-divided into p similar triangles of equal areas with each other; and that there are required n interior similar hollow triangles of equal areas with the foregoing; then let h' equal the height and b' equal the hase of the outer given triangle; h equal the height, and b eqnal the hase of the inner given triangle; and let i', i'', i''', etc., represent the consecutive heights, i, i', i'', etc., the consecutive hases of the required triangles reckoned from h and b; and $(w-1)$ and w the last two heights, and $(w,-1)$ and w' the last two hases; then the hase and height of the nth inner one are

$$i'^2_n = \frac{b}{h}\left\{\frac{(n+p)\,bh - nb'h'}{p}\right\}$$

and,

$$i^2_n = \frac{h}{b}\left\{\frac{n+p)\,bh - nb'h'}{p}\right\}$$

XVI. Having sub-divided the given hollow triangle, as in problem XIV. into any number of similar hollow triangles having equal areas witb each other, it is required to determine, in terms of the given heights and hases, the consecutive heights and hases of the required similar hollow triangles formed outside the given hollow triangle, each additional hollow triangle having equal area with the given sub-divisions. (Fig. XVI.)

Suppose tho given hollow triangle is suh-divided into p similar hollow triangles of equal areas with each othor; and that there are required n exterior similar hollow triangles of equal areas therewith, then let h' equal tho height and b' equal the haso of the outer given triaagle, and h equal the height and b equal the hase of the inner given triangle; let o', o'', o''', etc., represent the consecutive heights, and o', o'', o''', etc., the consecutivo hases of the required triangles reckoned from h'; and $(w-1)$ and w the last two heights, and $(w'-1)$ and w', the last two bases; then the hase and height of the nth outer triangle are,

$$o^2_n = \frac{b'}{h'}\left\{\frac{(n+p)\,b'h' - n\,b\,h}{d}\right\}$$

and

$$o^2_n = \frac{h'}{b'}\left\{\frac{(n+p)\,b'h' - n\,b\,h}{p}\right\}$$

Rolling Wheat to Market.—A new idea is advanced in our Chicago exchanges which amounts to literally rolling the grain into the markets. It consists in the invention of a circular car, 6 feet 6 inches in diameter, which does away almost entirely with hearing and friction on the axle, these heing only of sufficient hearing to provide simply for draft. The tire is of the same circumference as the car, which is cylindrical, and rolls directly on the track. One ton weight of car carries three tons weight of freight. Under the old system one ton weight of car carries one ton. It has had the favorable notice of railway experts, and if it proves what is claimed for it, will revolutionize railway carriage in some importaat directions, and in so far, of course, chcapcr freights, giving, it is thought, from 10 to 20 cents per hushel more to the farmer on wheat, according to the distance carried, than he now receives.

Oregon is pressing claims for damages by Indian wars.

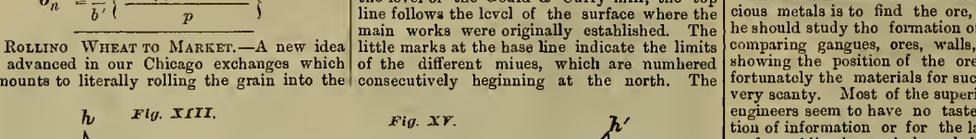


DIAGRAM SHOWING PAY CHUTES IN COMSTOCK LODE.

Pay Chutes in the Comstock Lode.

Editors Press:—On the 13th of May, 1876, you published a communication from me presenting a theory of the division of the Comstock lode into pay chutes and barren chutes, my reasons for it, and an engraving of the lode, showing the large bodies of rich ore, and the situation of the supposed chutes. In the three years that have elapsed since that date, $25,000,000 have been expended in exploring the lode, and all the additional evidence goes to strengthen the theory. The ore bodies found in the Sierra Nevada and Alta come within the limits of pay chutes not shown in my diagram made in 1876, but contribute to confirm the principles on which it was constructed.

The accompanying engraving, based on the map drawn by Mr. Parkinson, several years since, is intended to show a vertical section of the lode, drawn on a scale of 2,000 feet to the inch, as seen in imagination from the east looking westward. The base line is 3,000 feet below the level of the Gould & Curry mill; the top line follows the level of the surface where the main works were originally established. The little marks at the base line indicate the limits of the different mines, which are numbered consecutively beginning at the north. The following is a list of them with the length of each in feet.

No.	Mine.	Feet.	No.	Mine	Feet.
1.	Utah	1,000	12.	Chollar	1,400
2.	Sierra Nevada	3,325	13.	Bullion	943
3.	Union	575	14.	Exchequer	400
4.	Mexican	000	15.	Alpha	306
5.	Ophir	075	16.	Imperial	085
6.	California	000	17.	Yellow Jacket	957
7.	Con. Virginia	710	18.	Kentuck	93
8.	Best & Belcher	536	19.	Crown Point	541
9.	Gould & Curry	617	20.	Belcher	1,008
10.	Savage	771	21.	Alta	600
11.	Hale & Norcross	400			

Between the Belcher and the Alta, a distance of about 3,000 feet, I have not put down the mines, as there is some dispute about the situation of the vein. I confidently believe from the character of the ore found hy the Alta and Justice that both have heeu at work on the main Comstock lode, though common opinion for a long time placed it far west of them.

The dark portions of the engraving are intended to represent harren chutes; ths middle tint showa the pay chutes, which are harren over most of their area, and yet contain all the valuable deposits; the light color indicates the rich ore bodies; and the white lines running down from the surface show the main shaft.

Five pay chutes each nearly a quarter of a mile loug, horizontally, appear in the engraving, and between each adjacent pair, there is a harren chute of equal size. Tbe first pay chute commoneing at the north, contains a hody of rich ore in the Sierra Nevada and Union mines, but has produced neither dividends nor any considerable quantity of mineral as yet. The second pay chute discovered at tho surface in 1860, was very profitable for three years, then yielded uothing for 10 years, and for the last five years has heen profitahle. It has paid $140,000-000, gross, to the Mexican, Ophir, California and Consolida ted Virginia companies. The third, appearing in the Gould & Curry, Savage, Hale & Norcroas and Chollar mines, has turned out $40,000,000. The fourth, known as the Gold Hill bonanza, was worked at first at the surface as a gold placer; then mills were established to save the gold, losing most of the silver; and silver mills have succeeded them. The ground now owned hy the Imperial, Yellow Jacket, Kentuck, Crown Point and Belcher has produced $90,000,000. The fifth pay chute has yielded several millions, mostly to the Justice, hut has paid no dividends.

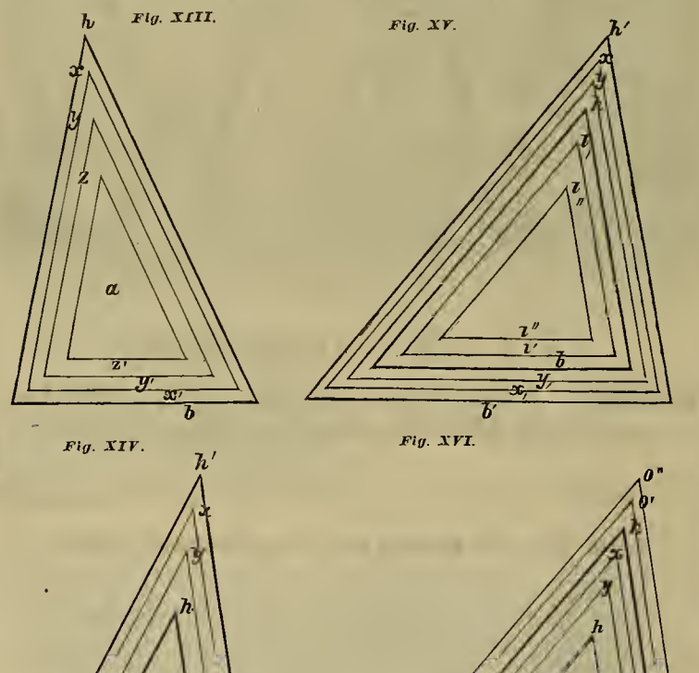
Tho main husiness of the miuer for the precious metals is to find the ore, and to do that he should study tho formation of the veins, hy comparing gangues, ores, walls, and diagrams showing the position of the ore hodies. Unfortunately the materials for such a study are very scanty. Most of the superintendents and engineers seem to have no taste for the collection of information or for the lahor of writing up for publication such knowledge as forced itself upon their attention. No comprehensive essay on the distrihution of ore in the gold and silver lodes of California and Nevada, has been printed; and careful descriptions of the mineralogical formation in even the richest mines are extremely rare, if not entirely lacking. There is a question whether the rules deducible from observations taken in auriferous quartz are applicable to silver lodes, though the presumptions are in favor of an affirmative answer, siuce hoth classes of mines contain the same two precious metals, in varying proportions. There are no gold mines without silver, and few silver mines without gold.

In reference to gold quartz, we know that the lines hetween the pay ore and the harren gangue in rich lodes usually run in nearly parallel directions at a angle of not less than 30 degrees to the horizon, dividing the vein matter into pay chute and harren chute; that the ore in a pay chute of a "milling" vein is a continuous hody; that the ore in "pocket" veins is found in hunches distrihuted in courses which are called "pay chutes" hy "pocket" miners; that if there are several pay chutes in a lode, they usually dip in the same direction and at the same angle to the horizon; that the wider and richer the vein and the more uniform the quality of the ore, the longer horizontally are the pay chutes; and that frequently every pay chute has some peculiar feature enahling old miners familiar with it to distinguish its ores.

Without pretending to have conclusive evidence, and partly for the purpose of providing a hasis for investigation and discussion, I claim that those principles apply to the Comstock; that all the facts observed in working that lode are in harmony with them; that the extensive and costly explorations made hetween the Utah and the Justice inclusive—a distance of more than four miles in the last 19 years, should hy a hundred chances to one have furnished proof against my theory if it did not apply to the Comstock; and that when the proof is conclusive, one practical result will he the saving of at least $3,000,000 annually in the cost of exploration. The engraving from my drawing—for which I do not claim perfect accuracy—is in harmony with the theory.

Now we have a considerahle body of information ahout the distrihution of the ore in auriferous quartz veins, and much more might he collected with systematic effort by half a dozen industrions and intelligent superintendents. In large and rich veins it is observed that the vein matter is divided into harren gangue and pay ore; that the ore extends in a pay chute in a continuous hody, streak, with very uaiform direction, dipping downwards from the surface; that if there are several pay chutes in one vein, all dip at the same angle to the horizon; that the wider and richer the lode, the longer horizontally are the chutes; that each pay chute has usually some peculiar feature so that the miners can distinguish its ores from others; and that the first business of the miner is to understand the size, dip and character of the pay chute. I think I have said enough to show that the distrihution of ore in silver mines deserves more attention than it has yet received from our mining community.

John S. Hittell.



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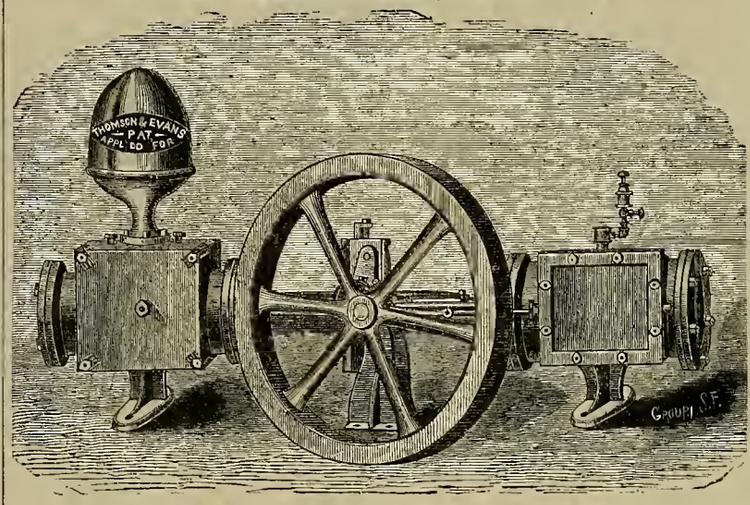

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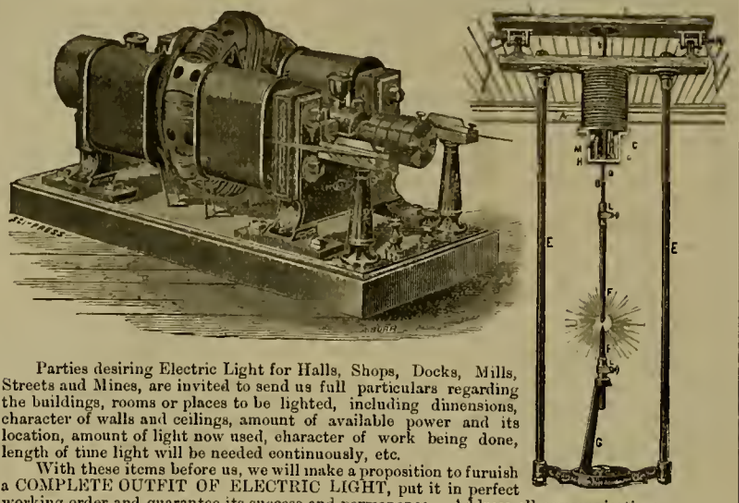

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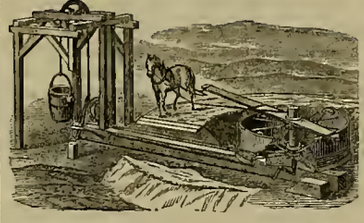

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[Continued from page 197.]

GOOD HOPE DISTRICT.

PROMISING MINES.—*Silver State*, Mar. 22: Four or five claims are being worked at present, and many others have been located. The principal claims are the Silver Brick, Buckeye, You and I, and Aurora, from each of which fine-looking ore has been taken. One of the owners of the Silver Brick recently returned from a visit to his mine, bringing with him some fine specimens of horn and ruby silver. It was found in a crosscut which was started on the 60 level of the mine, and is said to be an average sample of the ledge. No assay of it has yet been received. Some work has been done on each of the other claims, but not enough to form a correct idea of their value.

PARADISE DISTRICT.

PARADISE VALLEY MINE.—*Silver State*, Mar. 22: The Bray cut has been driven ahead 16½ ft, all in first-class ore. Face of this cut is about four ft wide, which assays about $200 a ton. No. 2 has been advanced nine ft, and is now in 121 ft. Face of this tunnel continues to show considerable sulphurets. No. 3 is getting wider and is looking considerably better. Eight ft has been made, making a total length of 148 ft. Have had the miners from this drift doing other work during the week; hence the short distance run. In the open cut just above No. 3, advance has been 18 ft. Ledge is full of headers crossing at right angles to the veins. These veins vary in richness. Some are nearly all ore, while others are not so good. Course of vein nearly due south, and dips to an angle of about 80° to the west. Continue to ship usual amount of ore to Rye Patch mill. Last two carloads assayed $202 per ton.

THE MOUNT ROSE.—This mine is developing finely. The main shaft has attained a depth of 60 ft, and is being sunk at the rate of two and one-half ft a day. The crosscut is in 45 ft, and what is known as the east drift, 70 ft. This drift is in good milling ore, which is being shipped to Torrey's mill. Very rich ore is now being found in the mine. It contains wire gold, horn silver, and bromide of silver, and assayed $10,000 to the ton in gold and silver. Twenty men are now employed on the mine.

THE BIG PRIZE.—This company is taking out ore right along, employing about 10 men. The mine was recently bonded by a San Francisco company for a short time, but the owners have not stopped work on this account, and do not care particularly about having the sale consummated.

ARIZONA.

OLOKE DISTRICT.—*Silver Belt*, Mar. 14: Rich ore, sulphurets and glance has been struck on the hanging wall of the Buckeye at the depth of 235 ft. The vein is 10 ft in width, containing fair milling ore from wall to wall, with a two-ft streak of very high grade ore. The Pioneer, property of Geo. Scott, is developing well; has a shaft 50 ft in depth sunk on the hanging wall. The ledge has not been cut to the footwall, hence its width can only be guessed at. One hundred and fifty tons of $100 ore is piled upon the dump awaiting the erection of a mill in that vicinity. In the Stonewall 230 level good ore has been struck in the whole face of the drift.

SILVER DISTRICT.—*Sentinel*, Mar. 15: There are now over 90 men in Silver district, and more are coming in. Hughes' shaft is now down over 50 ft, in first-rate ore. The Silver Glance is turning out some very rich rich ore. An accidental strike of rich ore was made lately in the wash north of Iron Cap. Some of the boys started to dig down in the gravel for water. Within a few ft they struck a seam of high grade ore, of which several sacks were filled that same day. The new find is very promising. Good accounts come from all the mines up there. Nuggets or ore claimed to be worth $2 per pound are being washed out of the gravel north of the Red Cloud.

IDAHO.

THE BUCKEYE.—*Silver Reef Miner*, Mar. 15: The mine in its workings is yet in its infancy, the greatest depth reached as determined by the inclines, not being above 150 ft. The main workings are on or near the south end of the claim, adjoining the Last Chance, and in a distance of 300 ft, five inclines have been sunk by chloriders. Those parties, after taking out many thousand dollars' worth of high grade ore, through the transpiring of their leases, retired leaving large bodies of second and third grade ore in sight, and the rich streaks of the veins from which they extracted wealth still going down. At the north end of the claim, where it joins the Kenner and Neutral, it is being prospected by three shafts sunk by chloriders, who at the present time have about 200 tons of high grade ore, worth over $160 to the ton. In the workings of Mr. Archy Florand, Mr. Branham now has a number of men employed sinking a working shaft and putting in an excellent whim for raising ores. The depth of the workings at this point are about 120 ft, and a large quantity of ore of various grades, ranging from $30 to $200 per ton is in sight. It is the design to work this part of the mine in a systematic manner, and there is no doubt that from this shaft alone sufficient ore can be extracted to run the three-stamp mill which does the crushing for the mine. About 20 tons of ore is worked per day. The Buckeye needs greater milling capacity. If the owner would put up a five-stamp mill at the mine, he could clear a few hundred thousand dollars in a short time. Mr. Branham, the owner, has secured a patent to his property. He employs at present 23 miners, and there are about a dozen chloriders still at work on the Buckeye. One hundred men could be profitably employed on the mine. The ore milled from the Buckeye has averaged $58 per ton.

OAMERINUS ITEMS.—*World*, Mar. 18: The tunnel started by Wm. O'Neil, to prospect the Forest Queen mine, was started on the ledge, followed 20 ft, and then discontinued on account of a heavy rush of water. A depth of nine ft was obtained. The ledge matter is eight ft wide, four ft being in quartz and the remainder stratas. The center streak of the ledge proper is from six inches to a foot in width. From this the best prospects are obtained. Mr. O'Neil is convinced that the ledge is an extension of the Magna Charta. The indications for a monstrous mine of richness are good. The surface on both sides of the ledge contains gold, which is a splendid indication. Work is going on in the Forest King, night and day. A depth of 125 or 130 ft has been reached, and the men are stoping. The ledge in the bottom of the shaft is five ft wide, and the ore good.

MONTANA.

NOTES.—*Miner*, Mar. 11: Some excitement in prospector's circles has lately been caused by the developments made on the Silver Shield lode, situated close to the North Star, and about a mile north of the Rainbow. The lode is four ft wide, and carries very high grade free-milling ore, some of it ranging as high as 300 ounces per ton. The title to the ground is in dispute, owing to repeated re-locations. Messrs. Nolan & Savery, owners of the famous Cable mine, have resumed work in the Cameron tunnel with the intention of extending this adit to the lode, from which it is now distant 500 ft. The present length of the tunnel is 650 ft. It will reach the lode 90 ft below the lowest workings. A month ago, in beginning work in this claim, Messrs. N. & S. concluded to run some distance further, a prospecting drift, following the lode, 30 ft from the surface. The tunnel had advanced only four ft beyond the point where work was discontinued years ago when a body of high grade, free-milling gold ore was reached. At present over 100 tons of this ore is in sight, with no appearance of its giving out. The total expense of mining and milling it will be less than $5 per ton; but since it carries an average of $30 per ton, the value of the strike can readily be comprehended. A great revival of mining in the Cable district is looked for.

IN the rolling mills of Pennsylvania there are 2,187 puddling furnaces, and in the rolling mills of the whole country there are 4,463.

THERE are over 67,000 Sunday schools in the country, with an aggregate attendance of 3,000,000 children.

Arizona.—No. 2.

Mining in the Bradshaw Mountains—Tiger District.

About two miles up the trail, easterly from the Tiger is located the Oro Bonito, a gold mine, Mr. W. A. D. Daunes being the superintendent, who very courteously gave us all the information sought, and supplied us abundantly with samples of the ore; in fact such was the case at all the mines we visited with the exception of the Tiger and the Peck. Here, for reasons which we do not understand, we were denied admittance. One would suppose that the Tiger interest might be best served by allowing proper persons at proper times to inspect it; as to the Peck, time and those who control and manipulate it, will tell the story as to its future value as a dividend-paying proposition. They have just erected upon the Oro Bonito property, a Huntington mill, with a crushing capacity of about 10 tons daily. It looks well but has not worked satisfactorily to the superintendent. The ore is in large part a decomposed and honey-combed quartz, carrying free gold and a considerable percentage in silver. They have in the aggregate 368 feet of tunnel. The width of the vein is 18 inches to three feet on the footwall, and on the hanging wall one to two and a half feet. In No. 2 tunnel the vein is three feet wide in the face of the tunnel. Various drifts and winzes have been run in addition to those already mentioned. The cost of wood here is $7 a cord, on a contract, delivered at the mill. Water is obtainable only from the mine at present, and in sufficient quantities to run the works 12 hours a day; but it is expected that as they get in on the tunnel, water in abundance will be found.

To show the difficulty of transportation in these mountains, it is said to have cost some $6,000 to bring the machinery for the Oro Bonito, weighing about 10 tons, from Walnut Grove, a distance of 25 miles. They had to build their road up and over a precipitous divide and down a very steep mountain side into the canyon where the Oro Bonito is located, and where the mountains rise up at a very sharp angle on either side.

Right above the Oro Bonito, on the side of the mountain, is located the Gray Eagle mine. It is well opened and has 500 or 600 tons of ore on the dump. It is free gold, carrying a liberal percentage of silver. It is owned by Mr. Richardson, who has a contract with the Hon. C. C. Bean, owner of the Luke mill in the Bradshaw basin, to pack and crush 300 tons of ore for him at $31 a ton. The ore is now being worked, at that mill, and I predict satisfactory results. He gets his water for the mine from a living spring in the side of the mountain. The mine is approached by a trail from the Oro Bonito, which is almost perpendicular, zigzaging up the side of the mountain, and by another trail, of more recent construction, from Luke's mill in the Bradshaw basin, over which the ore is packed on donkeys from the mine to the mill, a distance of about five miles. This mine has the appearance of being worked by a man who knows his business. Everything is kept snug and in order; no loose ends lying about, and the ore is worked clean to the walls, which are well defined. Mr. Richardson lacks capital to work his mine to the best advantage, and would like to interest some one with him who could furnish the amount of money necessary to enable them to work it so as to obtain the best results. Wood and water are abundant for milling purposes. Pine timber abounds in some parts of the Bradshaw range, especially in the Lynx Creek, Bradshaw, Pine Flat, Hassayampa, and Big Bug districts. The Gray Eagle vein will average three feet wide. It is a continuous, well-defined ledge. They have, I think, three tunnels run in on the ledge at different levels.

The Tiptop mine is about 10 miles across the country over a rough trail from the Gray Eagle. It has produced largely of bullion, but is very expensive to work, and has returned no margin of profit to the stockholders. The regular approach to this mine is by the Black Canyon road and Gillette, where the 10-stamp mill of this company is located, some eight miles from the mine.

There are other mines in this neighborhood, but they are not as well known as those I have named.

W. H. S.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

NOONDAY M. Co.—Object: To mine in Bodie district Capital, $10,000,000. Directors—R. C. Hooker, George R. Root, William J. Taylor, G. A. Holden and William B. Carr.

BONNURANT G. & S. M. Co.—Object: To operate generally. Capital, $2,500,000. Directors—W. B. Ewer, G. C. Fowler, E. T. Bacon, J. O. McCall, A. P. Bacon, G. L. Connor and W. H. Murray.

MONTE CRISTO CON. M. Co.—Object: To operate in Mono county. Capital, $10,000,000. Directors—J. D. Thompson, J. M. McDonald, Clinton Gurnee, L. Shores and B. F. Bevins.

BROPHY M. Co.—Object: To operate in Storey county, Nevada. Capital, $10,000,000. Directors—F. Tagliabue, Victor Fernbach, James M. Wilde, Thomas H. Lawler and George B. Merrill.

STREET & BLANCHE M. Co.—Capital, $10,000,000. Directors—L. L. Robinson, D. F. Verdenal, Thomas Street, F. Tagliabue and Thomas H. Lawler.

ARMSTRONG G. M. Co.—Object: To work in Butte county. Capital, $500,000. Directors—J. S. Rawlins, C. Stevens, P. Amiraux, J. W. Pew and William Armstrong.

High Explosives.

We have received a pamphlet issued by the California Powder Company, manufacturers of Hercules powder, in which is given decisions of the English and United States Courts in the litigation concerning the right to use nitro-glycerine as an explosive when mixed with certain other substances. The Giant Powder Company, owners of the Nobel patents, sued the Hercules Company for infringement on their rights, and there has been a fight between the companies for a long time. The pamphlet in question refers to the whole matter, gives those decisions of the American and English Courts which have been adverse to the Nobel patents, and points out the imperfections of said patents. We have not the space to relate the circumstances of the litigation, but those interested can no doubt procure the pamphlet on application. Suffice it to say, that the California Powder Company continues to manufacture and sell large quantities of Hercules powder, which, judging from the sales, must give satisfaction to the consumers.

The advantages claimed by the manufacturers, in their pamphlet, are as follows:

"Hercules powder is the strongest, safest and most effective of all nitro-glycerine powders. The No. 1 brand has the following composition: Carbonate of magnesia, 23%; nitro-glycerine, 77%. Carbonate of magnesia is by far the best absorbent of nitro-glycerine. Although we add but 77% nitro-glycerine, yet there would be no difficulty in making it absorb 80%, but in order to make our powder perfectly safe we deem it prudent to stop at this point. In addition to the great absorbing power of carbonate of magnesia, it has several other valuable properties.

"1st. The power it has of neutralizing any free acid that may have been left in the nitro-glycerine, thus rendering the powder absolutely safe and not liable to spontaneous decomposition and consequent explosion.

"2d. The uniformity of composition—free from grit or any other inherent quality capable of exploding the powder.

"3d. The carbonate of magnesia itself adds to the strength and power of the powder, since 58% of it becomes converted into the gaseous form during the explosion of the absorbed nitro-glycerine.

"4th. During the explosion of free nitro-glycerine, or nitro-glycerine absorbed by other porous bodies, compounds are formed which cause headache and other serious inconveniences to the workmen. Such is not the case with Hercules, as the carbonate of magnesia neutralizes all such injurious products.

"5th. The uniform character of carbonate of magnesia, which is a chemical preparation, enables us to manufacture a powder having always the same percentage of nitro-glycerine and never over-saturated, thus rendering spontaneous explosions and premature blasts impossible."

NOTES ON BEET SUGAR.—The proposed resuscitation of the Alvarado Beet Sugar works shows that the beet sugar industry in this State has some life, in spite of the many obstacles and hindrances which it has encountered. It may be mentioned also that the subject is reviving in the Eastern States and in the province of Canada, where experiments are being pushed under government patronage. The State of Maine is also enjoying the prospect of profitable production. We find several points of interest in the report of the first season's run in Maine. On the 21st day of October the company began the work of manufacturing sugar from beets, and within nine days after having the first beet go into the machinery, the company turned out all grades of sugars, from standard granulated to common concrete or melado, 94,467 pounds. The quantity of beets consumed to produce this amount of sugar has been 450 tons, and as they were used with tops and even dirt on, many having rotten leaves adhering to them, it must be admitted that the result so far obtained has been fully as good as in the best sugar manufacturing countries, and better than in France. It is one of the peculiarities of the American beet that the heads or leaf-crown contain almost as much sugar as the beet itself, and more than the average beet of France. A drying establishment has been erected in the most northern part of the State of Maine, where the beets have been sliced and kiln-dried preparatory to transporting them to the sugar factory in Portland.

SINCE the United States Supreme Court decision in the Reynolds case, it is estimated that 200 polygamous marriages have taken place in Salt Lake and St. George.

CALIFORNIA, for the first time since her admission to the Union, was unrepresented in the House of Representatives at the opening of the special session.

AT a school district meeting in Washington county, Oregon, the chairman ruled that women are not citizens of the United States.

FIFTY MILLION feet of logs are jammed in the Elk river, near Eureka, Humboldt county, for a distance of eight miles up the stream.

THE London Chamber of Commerce has adopted a resolution in favor of an international agreement for the remonetization of silver.

PATENTS AND INVENTIONS.

Foreign Patents for Pacific Coast Inventors.

The following foreign patents have been issued to residents of this coast:

Canadian.

8,312.—MANUFACTURE OF BUNGS—F. A. Howig, S. F. January 21, 1878.

8,333.—SNOW PLOWS—Geo. Royal, Truckee, Cal. January 22, 1878.

8,353.—CLOCK—W. A. Cates, Union, Ogn. Jan. 26, 1878.

8,457.—PANTALOONS—J. W. Davis, S. F. Feb. 23, 1878.

8,486.—WHEELS FOR VEHICLES—T. H. King, S. F. February 28, 1878.

8,489.—WASHING MACHINE—T. Austin, Virginia City, Nev. March 4, 1878.

8,512.—ANTI-FRICTION BEARING—T. H. King, S. F. March 8, 1878.

8,715.—FRUIT DRIER—W. S. Plummer, Portland, Ogn. April 30, 1878.

8,744.—DEVICE FOR CLEARING SWITCHES—G. Royal, Truckee, Cal. May 2, 1878.

8,994.—SCRUBBING MACHINE—A. F. Stockley, Bishop Creek, Cal. July 10, 1878.

English Patents

Which have passed the great seal:

4,567.—PORTABLE SAWING MACHINE AND TREE FELLER—Wm. H. Smyth, S. F. January 10, 1879.

3,677.—DOOR KNOB—J. F. Peacock and J. J. Zook, Reno, Nevada. February 21, 1879.

German.

4,013.—ADJUSTABLE RAM FOR RAM-BOATS AND SHIPS—D. McColgan, S. F. May 30, 1878.

4,592.—MODIFICATIONS IN BREECH-LOADERS—W. R. Finch, Eureka, Cal., and H. P. Fletcher, S. F. Aug. 17, '78.

News in Brief.

THE plague has reappeared in Russia.

THERE are 7,000 Chinamen in Butte county.

TEXAS papers are praying for the whipping-post.

THE U. S. war-ship *Alaska* has sailed for Alaska.

COMPLETE anarchy prevails at Mandelay in Burmah.

TERRIBLE prairie fires have recently occurred in Kansas.

SITTING BULL is again seriously threatening the border.

THE "dive" nuisance is getting a strong hold on Oakland.

MANY avalanches have recently occurred in Austrian Tyrol.

INDIAN beggars are very troublesome in Lake county, Oregon.

A DEADLOCK is anticipated in the House of Representatives.

TULARE fields do not look green, but the farmers look blue.

ELEVEN HUNDRED Persians have been killed by an earthquake.

THE clam cannery at Puget Sound is doing a profitable business.

THE Rhode Island Legislature has refused suffrage to women.

RUSSIA has adopted a conciliatory line of policy toward Turkey.

THERE is great sickness among the British troops in South Africa.

THE Atlantic sea ports are to be quarantined against the black plague.

TURKEY is threatening Greece and has ordered a man-of-war thither.

GRASSHOPPERS have made their appearance in the Reese River district.

A TORNADO in Georgia recently destroyed $100,000 worth of property.

THE Clearing House banks of New Orleans have temporarily suspended.

IMMIGRATION from California and the East into Arizona is on the increase.

THE electric light is to be employed in the library of the British Museum.

A HEAVY forgery of Dupont-street bonds has come to light in San Francisco.

FOUR cargoes of coolies are crossing the Pacific for the shores of Oregon.

EASTERN oysters are being propagated with some success in San Francisco bay.

RUSSIA is negotiating for the purchase of the Ladrone island, in the North Pacific.

THE necessary repairs on the *Jeannette* for her Arctic expedition will cost $40,000.

THE practice of robbing sluice boxes is becoming quite too frequent around Ione.

CANADA will be held responsible for Sitting Bull's invasion, he being a British subject.

THE furious wind and snow of last week caused considerable damage at Lake Tahoe.

AMERICA is successfully competing with Amsterdam and London in diamond cutting.

AMERICAN meat is about to be imported for the German markets by an English company.

A BILL has been introduced into Congress to remove the political disabilities of Jeff. Davis.

PIKE are caught in Putah creek that weigh as high as seven pounds, and the creek is full of them still.

A LARGE land slide occurred last week at the southern opening of tunnel No. 3, South Pacific railroad.

THERE seems to be no possibility of indncing an English University crew to row in the United States this summer.

THE Memphis cotton and woolen mills were struck by lightning on the 22d and totally destroyed. Loss, $90,000.

THE Monterey Whaling Co. captured a fine hull whale on the 23d, of the California gray species, after an exciting chase.

THE citizens of Cacheville have got rid of the Chinese by the owners of the premises in which they lived pulling down their shanties.

Bullion Shipments.

Since our last issne, we have noticed the following bullion shipments:

Bodie, March 17th, $5,272.78; Ophir, March 18th, $20,923.15; Northern Belle, March 19th, $6,916.01; Standard, March 20th, $19,568.68; Bulwer, March 20th, $17,495.40; Paradise Valley, March 20th, $2,288.68; Alexander, March 21st, $12,743; California, March 22d, $82,828.98; Northern Belle, March 22d, $12,004.62; Con. Virginia, March 22d, $74,688.75; Paradise Valley, March 22d, $3,259.59; Independence, March 24th, $6,700; Grand Prize, March 24th, $4,700; Christy, March 25th, $5,995; Manhattan, March 21st, $11,461.

THE regular government of Sonora, under Mariscal, has been overthrown by Serna. The forces of the general government aided the revolutionists.

THE Russian Nihilists have killed a government spy and attempted the life of a chief of the gendarmes.

THE Oregon & California Stage Company had six horses drowned in a slough near Canyonville recently.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurauce Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

CAPITAL CLOTHING.—One of the proprietors of this journal having for six months past worn a gray suit manufactured by the Capital Woolen Mills, Sacramento, we can now speak in high praise of the wearing qualities of their goods and manufacture. Also of their prices. Try them

M. D. SHRADER is now an authorized agent of the PACIFIC RURAL PRESS, also MINING AND SCIENTIFIC PRESS, to solicit subscriptions and receive the money for the same His receipts given for such money will be duly honored by this company.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. Sec ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco.

GENERAL MERCHANDISE.

[WHOLESALE.]
WEDNESDAY M., March 26, 1879.

BAGS—Jobbing.		**NAILS.**	
Eng Standard Wheat.	9 @ 9½	Assorted sizes, keg	2 90 @ 3 00
Neville & Co.		**OILS.**	
Hand Sewed, 22x36..	9 @ 9½	Pacific Glue Co's	
24x36.....	—@—	Neatsfoot, No 1.	1 00 @ 90
23x40.....	11 @—	Castor, No 1.....	1 10 @ —
Machine Swd, 22x36.	9 @ 9½	do, No. 2.....	1 05 @ —
Flour Sacks, halves...	7½@ 9½	Baker's A A.....	1 25 @1 30
Quarters.....	4½@ 6	Olive, Plagniol....	5 25 @5 75
Eighths.....	3½@ 4	Possel.....	4 75 @5 25
Hessian, 60 inch....	12½@13	Palm, lb.....	9 @ —
45 inch.....	7½@ 8½	Linseed, Raw, bbl.	72 @ —
40 inch.....	7½@ 8	Boiled.....	75 @ —
Wool Sacks,		Cocoanut.....	55 @ —
Hand Sewed, 3½ lb..	—@45	China nut, ca.....	70 @ 72½
4 lb do.	50 @62½	Sperm.....	1 40 @ —
Machine Sewed....	45 @—	Coast Whales.....	40 @ —
Standard Gunnies....	13½@14	Polar	45 @ —
Bean Bags.....	7 @ 7½	Lard.....	90 @1 00
CANDLES.		Oleophine.....	22 @ 22½
Crystal Wax.....	17 @—	Devoe's Brit'.....	22 @ 23½
Eagle.....	12 @—	Photolite.....	— @ —
Patent Sperm.....	30@—	Nonpariel.....	31 @ 32½
CANNED GOODS.		Eureka.....	18 @ 42½
Assorted Pie Fruits,		Barrel Kerosene...	20 @ —
2½ lb cans.....	2 00 @ —	Downer Ker.....	37½@ —
Table do.....	3 00 @ —	Elaine.....	37½@ —
Jams and Jellies..	3 50 @ —	**PAINTS.**	
Pickles, hf gal....	3 15 @ —	Pure White Lead.	8 @ 8½
Sardines, qr box..	1 67½@1 90	Whiting.....	1½@
Hf Boxes.....	2 50 @2 75	Putty.....	4 @ 5
Preserved Beef,		Chalk.....	1½@ —
2 lb. doz.....	4 00 @ —	Paris White.....	2½@ —
do Beef, 4 lb, doz.	6 50 @ —	Ochre.....	3½@ —
Preserved Mutton,		Venetian Red.....	3½@ —
2 lb. doz.....	4 50 @ —	Averill Mixed	
Beef Tongue.....	6 50 @ —	Paint, gal.	
Preserved Ham,		White & tints..	2 00 @2 40
2 lb. doz.....	6 50 @ —	Green, Blue &	
Deviled Ham, 1 lb,		Ch Yellow.....	3 00 @3 50
doz.....	3 50 @ —	Light Red.....	3 00 @3 50
do Ham, ½lb doz.	3 00 @ —	Metallic Roof...	1 30 @1 60
COAL—Jobbing.		**RICE.**	
Australian, ton..	8 00 @—	China, Mixed, lb...	5 @ 5½
Coos Bay,.....	6 50 @ 7 00	Hawaiian.....	7 @ 7½
Bellingham Bay.	6 50 @—	**SALT.**	
Seattle.....	6 00 @ 6 50	Oal. Bay, ton....	15 00 @22 50
Cumberland....	14 00 @—	Common.....	10 00 @12 00
Mt Diablo.....	4 75 @ 6 00	Carmen Id.....	12 00 @14 00
Lehigh.....	13 50 @—	Liverpool fine...	19 00 @—
Liverpool.....	7 50 @ 8 00	**SOAP.**	
West Hartley..	10 50 @—	Castile, lb.....	10 @ 10½
Scotch.....	10 50 @—	Common brands..	4½@ 6
Scranton.....	11 50 @—	Fancy brands.....	7 @ 8
Vancouver Id...	7 00 @—	**SPICES.**	
Charcoal, sack...	75 @—	Cloves, lb.....	45 @ 50
Coke, bbl.....	50 @—	Cassia.....	22½@ 25
COFFEE.		Nutmegs.....	85 @ 90
Sandwich Id, lb.	— @—	Pepper Grain.....	15 @ 17
Costa Rica.....	15 @ 16	Pimento.....	15 @ 16
Guatemala.....	15 @ 16	Mustard, Cal.,	
Java.....	23 @— 26	½ lb glass.....	1 50 @ —
Manila.....	17 @— —	**SUGAR, ETC.**	
Greund, in cs...	25 @— —	Cal. Cube, lb.....	11½@ —
FISH.		Powdered.....	11½@ —
Sac'to Dry Cod..	4½@ 5½	Fine crushed.....	11½@ —
do in cases..	5 @ 6	Granulated.....	11 @ —
Eastern Cod.....	— @— —	Golden C.....	9½@ —
Salmon, hbls....	8 00 @ 9 00	Cal. Syrup, kgs...	70 @ —
Hf hbls.....	5 00 @ 5 50	Hawaiian Molasses	26 @ 30
1 lb cans.....	1 40 @ 1 45	**TEA.**	
Pkld Cod, hhls..22	00 @— —	Young Hyson,	
Hf hhls.....	11 00 @— —	Moyuno, etc.....	27 @ 30
Mackerel, No. 1.		Country pckd Gun-	
Hf Bbls.....	9 50 @10 50	powder & Im-	
In Kits.....	1 35 @ 2 10	perial.....	50 @ 60
Ex Mess.....	3 25 @— —	Hyson.....	30 @ 35
Pkld Herring, hf	3 00 @ 3 50	Pooo-Chow O.....	35 @ —
Boston Smkd Hrg.	70 @— —	Japan, 1st quality	40 @ —
LIME, Etc.		2d quality.....	20 @ 25
Plaster, Golden			
Gate Mills....	3 00 @ 3 25		
Land Plaster, tn	10 00 @12 50		

METALS.

[WHOLESALE.
WEDNESDAY M., March 26, 1878.

IRON.—	
American Plg, soft, ton...	23 00 @25 00
Scotch Plg, ton.....	25 50 @26 50
American White Plg, ton.....	23 00 @— —
Oregon Plg, ton.....	26 50 @— —
Refined Bar.....	2½@ 3½
Horse Shoes, keg.....	5 00 @— —
Nail Rod.....	—@ 7
Norway, according to thickness.....	6½@ 7
COPPER.—	
Sheathing, lb.....	34 @ 35
Sheathing, Yellow.....	19 @ 20
Sheathing, Old Yellow.....	— @—
STEEL.—	
English Cast, lb.....	16 @ 17
Black Diamond, ordinary sizes.....	16 @— —
Drill.....	18 @ 17
Flat Bar.....	16 @ 19
Plow Steel.....	8 @ 12½
TIN PLATES.—	
10x14 I C Charcoal.....	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin.....	18 @— 20
Australian.....	15½@ 17
ZINC.—	
By the Cask.....	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask..	9½@— 10
NAILS.—	
Assorted sizes.....	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, March 26, 3 P. M.

SILVER. 1½@2.
GOLD BARS, 890@910. SILVER BARS, 8@20 ₱ cent. discount.
EXCHANGE on New York, 20, on London bankers, 491@ 49½. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 86@88.
LONDON Consols, 96 5-16; Bonds, 103.
QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending March 25, 1879.

HIGHEST AND LOWEST BAROMETER.

Mar 19	Mar 20	Mar 21	Mar 22	Mar 23	Mar 24	Mar 25
30.003	30.129	30.130	30.264	30.247	30.296	30.258
29.980	30.010	30.103	30.185	30.221	30.221	30.159

MAXIMUM AND MINIMUM THERMOMETER.

58	58.7	61.8	61.7	63	66	65
53	51.5	51	51	53	57	55.3

MEAN DAILY HUMIDITY.

75.7	67	65	84.3	83.3	87.3	83.6

PREVAILING WIND.

SW	NW	SW	N	NW	W	W

WIND—MILES TRAVELED.

235	204	181	157	112	145	106

STATE OF WEATHER.

Rainy	Fair.	Cloudy	Cloudy	Cloudy	Cloudy	Fair

RAINFALL IN TWENTY-FOUR HOURS.

.20	.16	.03	.32	.01	

Total rain during the season, from July 1, 1878, 20.07 in.

Fine Engraving.

The Engraving Bureau belonging to the office of this journal is prepared to design and engrave all kinds of WOOD CUTS for illustrating newspapers, books, catalogues, cards, circulars, advertisements, labels, badges, seals, etc., in the best style of the art. Our portraits and illustrations of machinery, buildings and landscapes, are superior. Good engravings can be made from paintings, lithographs, steel and copper plate prints, photographs, models, patent office or other drawings. We have a photographic department and the best of machinery for producing accurate and perfect work at the lowest prices. Original maps, charts, and diagrams are made by our NEW PHOTO-RELIEF PROCESS at greatly reduced rates. By the same process copies can be cheaply and quickly produced of printed cuts, in *fac simile*, or they can be enlarged or reduced with equal facility.

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Mining and Other Companies.

Griffith Consolidated Mill and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California. NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 21st day of January, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
J H Brewer.....	30	50	$ 10 00
Warren Bryant.....	not issued	2100	420 00
Alexander Bryant....	37	1125	225 00
Alexander Bryant.....	38	1125	225 00
L H Foote	39	100	20 00
L G Harvey, Trustee	35	4000	800 00
J H Roberts.....	19	500	100 00
J H Roberts.....	20	500	100 00
J H Roberts.....	21	500	100 00
J H Roberts.....	22	500	100 00
J H Roberts.....	26	500	100 00
J H Roberts.....	27	500	100 00
J H Roberts.....	28	500	100 00
J H Roberts.....	29	500	100 00
J H Roberts.....	30	500	100 00
J H Roberts.....	31	500	100 00
J H Roberts.....	32	500	100 00
J H Roberts.....	33	500	100 00
J H Roberts.....	34	500	100 00
J H Roberts.....	280	200	40 00
J H Roberts.....	281	200	40 00
J H Roberts.....	282	200	40 00
J H Roberts.....	283	200	40 00
J H Roberts.....	284	200	40 00
John G Vantine.....	not issued	4500	900 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, No. 330 Pine street, Room 48, San Francisco, California, on the 26th day of March, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. G. M. CONDEE, Secretary.

Office, Room 48, No. 330 Pine St., San Francisco, Cal.

POSTPONEMENT.—The above sale has been postponed until Saturday, April 5th, 1879, at the same hour and place. By order of the Board of Trustees.

G. M. CONDEE, Secretary.

Mount Jefferson Milling and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors held on the 21st day of March, 1879, an assessment (No. 9) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 318 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 2d day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 27th day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

Office Wide Awake Prospecting and Mining Company.—No. 232 Sutter Street, San Francisco, Cal., February 1st, 1879. Location of works, Picket-Post, Pinal County, Arizona.

Notice is hereby given that at a meeting of the Board of Directors, held on the first day of February, 1879, an assessment (No. 6) of four cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the Company, Room 2 No. 232 Sutter Street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the fifth day of April, 1879, to pay the delinquent assessment, together with the cost of advertising and the expenses of sale. By order of the Board, of Directors. C. HILDEBRANDT, Secretary.

POSTPONEMENT.—The delinquent day of the above named assessment has been postponed until Tuesday, the First day of April, 1879, and the day of sale until Thursday, the First day of May, 1879, at the same hour and place. By order of the Board of Directors.

C. HILDEBRANDT, Secretary.

San Francisco, March 1st, 1879.

Summit Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Bayes, W T	38	700	35 00
Edwards, J E	39	700	35 00
Gautier, Gustave.....	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee.....	206	200	10 00
Lehmann, C, Trustee.....	207	200	10 00
Sanford, E P.....	3	500	25 00
Sanford, E P.....	22	1000	50 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board o Directors, made on the Fourth day of February, A. D. 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public action, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

The California and Oregon Land Company.—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the First day of March, A. D., 1879, an assessment (No. 2) of Forty Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of April, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Saturday, the Tenth day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco, California.

Union Stone Company.—The Regular Annual meeting of the Union Stone Company of California for an election of a Board of Directors (to act as Trustees) to serve the Company for the ensuing year, and for such other business as may properly come before the meeting, will be held at the office of the Secretary of the Company at 237 First Street, San Francisco, California, on Tuesday, April 8th, 1879, at 11 o'clock A. M.

R. F. KNOX, Secretary.

San Francisco, March 20th, 1879.

Amusements.

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CHEROKEE, Sept. 8th, 1878.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.

Office, No. 320 Sansome street, Room 10.

GOLD MINE WANTED.

One now paying more than expenses. Addres

W. S. KEYES, M. E.,

No. 310 Pine St., Room 42, San Francisco

Prompt Attention to Business.

AURORA, Nev., Dec. 7th, 1878.

MESSRS. DEWEY & CO., S. F.—*Dear Sirs:*—I acknowledge the receipt of my patent per express this morning, and am obliged for same. I do not know what to say to you regarding your prompt attention to business, but will say to my friends what I cannot say to you. Many thanks is what you will get from Yours truly, C. W. LANE.

BURLEIGH ROCK DRILL,
Does more work at Less Cost
THAN ANY OTHER ROCK DRILL.

FIRE ENGINES,

Babcock Chemical Engines,
Hose Carts and Fire Extinguishers.

Mining Machinery Depot,

PARKE & LACY, 417 Market St.

AIR COMPRESSORS and ROCK DRILLS.

HOISTING ENGINES,

ALL SIZES, DOUBLE AND SINGLE, WITH SINGLE and DOUBLE REELS.

Pressure Blowers. Diamond Anti-Friction Metal. Flexible Shafts.

PUMP
And
AIR
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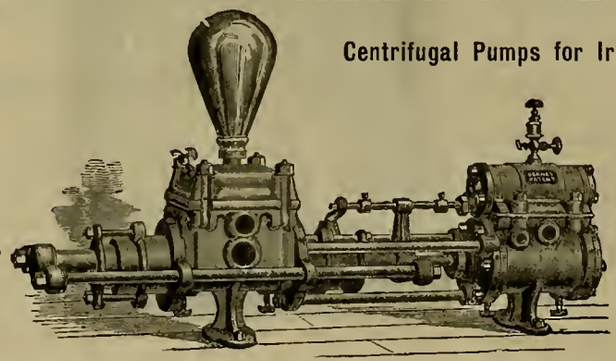
HOOK
And
LADDER
Trucks.



Centrifugal Pumps for Irrigating.

DEANE'S STEAM PUMPS,
VERTICAL AND HORIZONTAL.

BURLEIGH AIR COMPRESSOR
Gives Better Results than any Compressor Known.

Putnam's Wood-Working Machinery.

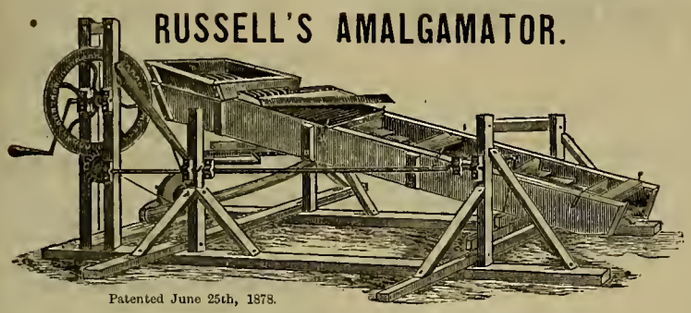
MACHINISTS' TOOLS.

Lathe Chucks. Farmers' Battery.

HILL'S EXPLODERS.

SEND FOR CIRCULARS.

RUSSELL'S AMALGAMATOR.



Patented June 25th, 1878.

SAVE YOUR GOLD

And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

IS GUARANTEED TO SAVE THE FINEST OR FLOAT GOLD.

Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

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SANDERSON BROS. & CO.'S

Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

A full and complete stock of this reliable and well-known brand of Steel, for mining and other uses, now in stock and for sale

At No. 417 Market St., S. F., - H. D. Morris, Agent.

San Francisco Pioneer Screen Works,

J. W. QUICK, MANUFACTURER,

SCREENS

Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

32 Fremont Street, San Francisco.

PROMPT AND SUCCESSFUL.—*Messrs. Dewey & Co.*:—Gentlemen: Your Circular letter, 12th inst., informing me of successful termination of my application for patent received. Please accept thanks for the prompt and successful manner in which you have managed this business Yours respectfully, J. H. CAVANAUGH
Walla Walla, Dec. 24th.

THE AMERICAN

All sizes, and adapted to from 3 to 500 feet head

TURBINE
Water Wheels

THE BEST IN THE WORLD!

Send for our Circular and Prices.

BERRY & PLACE,
Market St., Head of Front,
San Francisco.

THE SAFETY POWDER COMPANY,

San Francisco, Cal.

CARTRIDGE.

GEN. W. S. ROSECRANS,
President.

Fuse Lighter and Fuse.

COL. SAM'L O. GREGORY,
Secretary.

Safety Cap and Fuse.

Electric Cap.

Safety Powder, Caps, Electric Caps, and Fuse Lighters.

Under a series of U. S. Patents, after long and carefully conducted experiments and thousands of tests, this Company is prepared to manufacture and supply, for Mining and Engineering Works, the above named articles at prices and on terms as favorable as articles of similar grades are now supplied in this market. Our Powders contain no Nitro-glycerine, no Nitroline, no Gun Cotton, no Fulminates, and are free from the unavoidable dangers in manufacturing transporting, handling and using of all high grade explosives which contain those elements.

Cold does not affect them. They cause no headaches or other inconveniences in handling, and the smoke from their explosion contains no poisoning or sickening vapors.

Their blasting force, with slight tamping, at least equals that of any Powders now used, but they admit and require strong tamping to bring out their immense and peculiar lifting power which follows their detonating work. They should be fired, therefore, by our

Safety Cap,

Which allows tamping without danger. They can be fired by any caps now employed in blasting, but the use of these is always dangerous with any Powder, and the loss of the throwing power resulting from lack of tamping renders it with our Powders doubly objectionable.

Our SAFETY CAPS have twice or thrice the force of triple Giant Caps. When set on fire they do not explode, but merely burn off, and are perfectly safe in transporting and in tamping.

In round tin boxes, 50 cents.

The Safety Fuse Lighter,

Cheap, handy and sure to light the Fuse upon the end of which it is fastened, only needs a trial to be appreciated by every miner who is up to "snuffs." 25 Cents per box; sent by mail.

Safety Fuse,

Equal to the best in the market, will be supplied at the lowest market prices.

In consequence of spurious imitations of

LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature, thus,

Lea & Perrins

which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

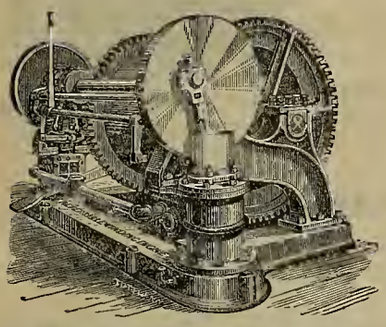
To be obtained of CROSS & CO., San Francisco.

A. L. FISH & CO., 9 and 11 First St., S. F., Cal.

AIR COMPRESSORS

—AND—

Air Column,



BACON'S HOISTING ENGINE.

Specially adapted to use in Mines, Hotels, Factories and Steamships, with BACON'S SAFETY STOP.

Steam

PUMPS,

AND

Pump Column,

STEAM

Fire Engines

AND

Hose Carts.

We guarantee to raise Water with these Pumps 1,000 feet, single lift, without shock or jar on Pumps or Pipes.

LATHES, PLANES,

ROCK DRILLS, Etc.

STEAM HAMMERS,

ENGINE

Governors,

WINE,

CIDER,

AND

Lard Presses.

UNION ROCK DRILL.

We offer this as the Least Complicated and Most Durable Rock Drill yet introduced.

ENGINES, BOILERS, QUARTZ MILLS, SAW MILLS, &c., &c.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS,

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

GARDNERS'

Celebrated

Governor

These Steam Governors have long been known as THE BEST, and as lately Improved and Perfected, they have no Rival.

THE SAFETY STOP

On these Governors is alone worth double the price of the Governor. We have sold over six hundred, and

Never one has Failed.

They are sold at the same price (or less) as ordinary Governors. Send for Circular.

BERRY & PLACE,

Market, head of Front St., San Francisco

RARE CHANCE.

For sale or to lease, a two-thirds interest in a good paying country newspaper. Address "LIBERAL," this office.

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This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y.

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MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

JOHN F. LOHSE, SEC'Y.

Office, No. 230 California Street, - - San Francisco, Cal.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive.

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞ Triple Force Caps and all Grades of Fuse.

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The FRUE ORE CONCENTRATOR.

Adams & Carter, Agents.

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MINING AND MECHANICAL ENGINEERS.

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Testimonials as to the perfect working of the Concentrator to be seen at the office.

VULCAN BLASTING POWDER.

The strongest and most economical explosive in use.

Wherever it has been given a test, it has surpassed all other high explosives.

Works at SAN PABLO, California, and RENO, Nevada. | Office, No. 123 California Street, SAN FRANCISCO.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 202 Sansome St., room 7.

Engraving done at this office.

Mine Wanted.

The advertiser is prepared to purchase a *good* California Gold mine; gravel or quartz. Must be in a condition to be examined and prospected.

Send full particulars, description, location and price to "MINER," care of Chas. G. Yale, Esq., editor of the MINING AND SCIENTIFIC PRESS, San Francisco, Cal.

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Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

☞ Send for a Circular.

A. S. HALLIDIE.

Office, No. 6 California St., San Francisco.

N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

Manfuactory. 17 & 19 Fremont St., S. F.

WANTED—$10,000.

For $10,000 cash in hand I will give a one-half interest in the BLUE JAY and ELEPHANT QUARTZ mines, situated in the French Creek Mining District, Siskiyou County, Cal. And I will take or give a lease on said mines, and pay or receive eight per cent. on the amount invested. For further particulars apply to H. C. Cory, Etna Mills, Siskiyou County, California.

Working Ores Dry.

Pamphlets on DRY AMALGAMATION forwarded free on receipt of address to ALMARIN B. PAUL, Room 20, Safe Deposit Building, San Francisco.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

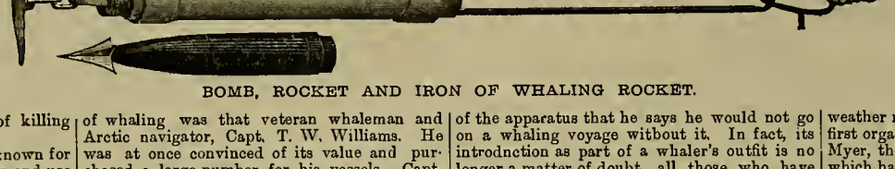
BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 5, 1879.

VOLUME XXXVIII Number 14.

The Roys and Liliendahl Whaling Rocket.

Although the idea of killing whales by means of bombs or rockets is by no meaus a new one, it is only very recently that the plan has been successfully carried out with any practical results. The Roys and Liliendahl whaling rocket, views of whicb are given herewith, is an ingenious application of the rocket prinoiple for propelling an immense bomb-lance with an enclosed loggle or harpoon attachment, and is capable of carrying a three-incb rope, or the ordinary whale line, with equal facility. The manufacturers of this weapon contend that it is the most destructive implement ever devised for the purpose of killing whales.



BOMB, ROCKET AND IRON OF WHALING ROCKET.

The Roys whaling rocket has been known for a number of years, but its introduction and use bave not been successful, for the reason that the defects in construction operated against its efficiency. It was used on this coast, with some measure of success, in different localities. Messrs. J. N. Fletcber and R. L. Suits, 407 Front street, San Francisco, owners of patent rights for this coast, experimented witb the rocket for some time in order to test it and find out the defects, knowing the principle was good. They found that it had been previously made too light, and that there was not powder enough in it. Moreover, in order to make it cheap, the details of the construction had not been carefully worked out. They have improved upon the rocket, made it heavier and stronger, and finally made a practical thing of it. Its defects have been entirely eradicated, so that notwithstanding the great weight of the projectile, which is about 32 pounds, it can be almost as easily handled as an ordinary bomb-gnn; and what is particularly noticeable, can be forced without detriment to tbe shoulder.

KILLING WHALE WITH THE ROYS AND LILIENDAHL WHALING ROCKET.

The apparatus consists of a strong brass cylinder containing the projectile charge. This is loaded with a peculiar powder, made by Fletcher & Suits themselves. In the front of this is secured a bomb containing an explosive charge, and inside of it is a harpoon attached to the shell. An iron is secured to the rear end of the rocket, to which is attached the whale line. The bomb has a bearded or barbed point, and when projected into the whale by the rocket, explodes, inflicting a fatal wound. At the same time tbe harpoon takes its hold, and the boat is fastened to the whale by the line attached to the iron. These shots are good for killing and fastening to a whale at 30 fathoms distance, which is, of course, very much further than an ordinary harpoon is available. The whole apparatus weighs 32 pounds, and from the point of the bomb to rear end of iron is six feet six inches in lengtb.

A peculiar rest is used in firing the rocket, having on it a shield to protect the operator from the fire which issues from the rear end of the rocket. The rocket is set in the rest, the rear end of wbich is placed on the shoulder, and by discharging a pistol charge into a hole provided for the purpose—after aim is taken—the projectile is discharged and the rocket powder carries the rocket, bomb and line in the direction required. The construction and operation will be clearly seen from the accompanying engravings. The line is placed in the usual tub in the boat coming down forward of the standard, as will be seen by the cut. As there is absolutely no recoil, tbe rocket can be used from boats of light construction, as well as from steam launches or heavy boats.

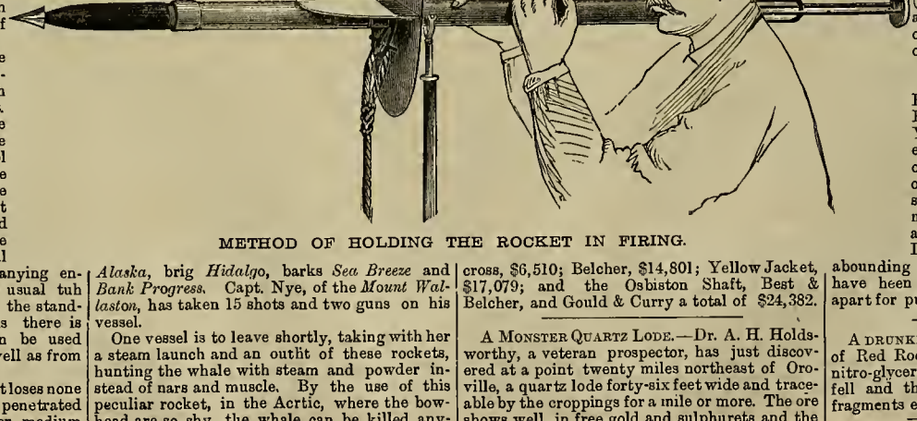
Another advantage is that this shot loses none of its force or velncity when it has penetrated the water, as the gas having a denser medium to react upon, propels the shot witb the same velocity that it wonld through the air.

The manufacturers have, at various times during tbo nast winter, given exhibitions of the practical working of this weapon, and the masters of whaling vessels have been so favorably impressed with it that almost the entire fleet sailing from or visiting this port are now armed with it as part of their outfit.

Among the first to look into this new method of whaling was that veteran whaleman and Arctic navigator, Capt. T. W. Williams. He was at once convinced of its value and purchased a large number for his vessels. Capt. Cogan, of the bark *Rainbow*, and inventor of the Cogan breech-loading homb-gun, having seen some of these shots fired, was so favorably impressed that he ordered a number of them for his vessel. Capt. Owens, of the *Coral*, has also armed his vessel with them, and will no doubt give a good account of them when he returns from the Arctic. Capt. Smith, of the steam brig *Siberia*, is also plentifully supplied. Capt. Canghell, of the schooner *Newton Booth*, has heen using these rockets down the coast so successfully that he has telegraphed for a new supply of shots. Among other vessels which have them we may mention the schooners *Leo* and *Alaska*, brig *Hidalgo*, barks *Sea Breeze* and *Bank Progress*. Capt. Nye, of the *Mount Wallaston*, has taken 15 shots and two guns on his vessel.

One vessel is to leave shortly, taking with her a steam launch and an outbt of these rockets, hunting the whale with steam and powder instead of nars and muscle. By the use of this peculiar rocket, in the Acrtic, where the bowhead are so shy, the whale can be killed anywhere within a distance of 30 fathoms, while in the old-fashioned way it is very difficult to get near enough to them to kill. Very little practice will onable anyone to shoot the rocket very accurately, and wherever it strikes it kills, no whale getting away when struck. Messrs. Fletcher & Suits have acquired the right of manufacture and sale of these rockets for this market. Capt. Williams, an owner of three whaling vessels, is so convinced of the efficiency of the apparatus that he says he would not go on a whaling voyage witbout it. In fact, its introdnction as part of a whaler's outfit is no longer a matter of doubt, all those who have used it speaking highly of the apparatus.

The bark *Legal Tender*, whicb goes up to the Arctic in June to bring back oil from the fleet, will take up a number of guns and shots for the whalers which are not already provided witb them; and will also supply additional shots to all who want them.



METHOD OF HOLDING THE ROCKET IN FIRING.

PAY ROLLS.—The men employed in some of the leading mines on the Comstock received their monthly wages a day or two since. The amounts disbursed by these several companies were as follows: Savage, $9,224; Hale & Norcross, $6,510; Belcher, $14,801; Yellow Jacket, $17,079; and the Osbiston Shaft, Best & Belcher, and Gould & Curry a total of $24,382.

A MONSTER QUARTZ LODE.—Dr. A. H. Holdsworthy, a veteran prospector, has just discovered at a point twenty miles northeast of Oroville, a quartz lode forty-six feet wide and traceable by the croppings for a mile or more. The ore shows well in free gold and sulphurets and the find is considered one of great value.

International Meteorology.

We printed last week an item calling for the extension of the work of the Signal Service so that daily observations could be exchanged between all the leading points nf the world by telegraph. It seems that events are gradnally tending toward this result and tbrough direct efforts of our own Signal Service wbich has pressed the subject upon the attention of other nations. The permanent committee of the Vienna Meteorological Congress have just paid the United States the high compliment of recommending to a proposed second congress the adoption throughout the world of a plan for exchanges of data for simultaneous weather maps or other purposes, similar to one first organized for the United States by Gen. Myer, the Chief Signal Officer, in 1873, and which has been continuously pursued by the Signal Service to this day.

The features of this exchange, as set on foot by the United States, are as follows: 1st. Tbe Signal Office of the United States asks all countries to make and record daily, on land and sea, one simultaneous weather observation at the same exact instant of time. 2d. The United States then exchanges with each country separately, making an especial request nf each to establish such exchange. 3d. Each country sends to the United States every 15 days its own observations; all are thus received by the United States. 4th. The Signal Office of the United States then collates and prints all, its co-incident observations iucluded, and returns in this shape to every regular obser ver, who has sent contiuuously a single report, the reports gathered from almost the whole northern hemisphere. For one report sent regularly hy any regular observer anywhere, on ship or shore, he receives 500, and these 500 surround and cover nearly the northern hemisphere. It has heen the theory of the Chief Signal Officer that, with such information so widely diffused, a great deal of work will be done by separate observers in every country which will he of use to all, but which the solitary observer alone could never tbink of undertaking unless the data have been thus laid down before him. The United States need the data for themselves, and they help besides an international union of brains as well as hands.

For nearly six years this exchange, originated and conducted hy the Signal Service of the United States, has been perfectly successful, almost every civilized nation north of the equator has taken part in it. It bas made possible for the first time in the history of the world tbe preparation of a daily simultaneous map of the northern hemisphere, at Washington (this also is sent to each observer), and has probably advanced the study of practical meteorology as far as any one undertaking in the last century.

WONDERS OF THE YELLOWSTONE REGION.—According to the report of P. W. Norris, Superintendent of the Yellowstone National Park, there exists in that district a mountain of obsidian or volcanic glass. It stands on the border of an immense boiling spring, whence it arises in high masses, the surface so smooth that an Indian could not climh up it. It is well that a tract nf country so abounding in strange natural curiosities should have been reserved from settlement and set apart for public nses.

A DRUNKEN man staggered through the streets of Red Rock, Penn., carrying eight pounds of nitro-glycerine in a bag on his hack. He finally fell and the resulting explosion did not leave fragments enough of him to bury.

THE Sonora revolution is practically ended.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Notes from Virginia City.

Editors Press:—The long-pending compromise hetween the mining companies and the Sutro Tunnel Company has at last been consummated, hut the henehts to he derived by the mining companies, in the way of drainage, will he delayed for some months to the all mines not situated near the line of the tunnel. The first to take advantage of it will he the Savage, Hale & Norcross, and Chollar Potosi. The others, hoth north and south of the tunnel, will have to wait nntil the lateral tunnels reaches them. The tunneling north aud south I do not think can hs commenced until the sub-drain is completed, and the hoxes iu place and covered, and track relayed. But the fact being established that there is to he no more talk and skirmishing hetween the mining companies and the tunnel company, and that the former have heen compelled to acknowledge that they cannot well get along without the use of the tunnel, will have a tsndency to give people more coufidence for the fnture of the mines, and will also make it more certain that a great number of men now ont of employment will find work in the tunnel and mines. Of course some time must elapse hefore the full benefit of the settlement will be realized, hut the uncertainty as to the result of negotiations hetween the contending parties is now done away with, and we must now wait for the henefits to accrue.

The probahility of the adoption of the new Constitution in California is used extensively hy the "hears" to press down stocks to the lowest figures possihle, and the game is succeeding to a charm. It seems that it has but lately hecome apparent to the hrokers of San Francisco that if the new Constitution is adopted their business will he ruined, and that the gambling that they are now engaged in will come to an end, and that they will be compelled to seek some other field for the exercise of their geniuses. I am inclined to think that the adoption or rejection of the new Constitution will not effect the business of mining, and that the cry is used now to make a grand smash in "securities," and that the same brokers who say that their business will be ruined if it is adopted are only doing so to speculate on the credulity of the masses. They have now about six weeks in which to stock the cards and prepare to draw the four aces when the time comes for them to show their hands. If that new Constitution is to be so ruinous if adopted, why has it not been found out hefore this? The fact has not been discovered until lately.

The yield of bullion from the Con. Virginia for this month, so far, has been in excess of that of last month to this time, and there seems to be some probahility that a dividend will he declared for the month of March. It will require two or three months before Sierra Nevada will be in readiness to commence tbe extraction of ore. The North Con. Virginia shaft has reached the 1700 level of the south drift of the Sierra Nevada, and the east shaft has been connected with the drift from the incline on the 2200 level, which connection has improved the ventilation in the lower levels of the mine greatly, and will enable the work of opening up the mine to be proceeded with much more rapidity. The incline has reached the 2400 level, hnt whether a station will he cut out there and a crosseut run west into the ore body, or drift be run north and south and the incline extended to a further depth, is not known to outsiders.

The Leviathan company have nearly completed the repairs of damage to their cage and car (occasioned by the breaking of the cable and dropping them some 400 feet, to the hottom of the shaft) and obtained new cahles. They will he in readiness to start up again in a few days, when I believe it is the intention to commence crosscutting on the nortb 750 level drift, east and west, which must, from all indications, bring them into ore. It is said to be the intention of the Con. Virginia and California companies to run a joint drift west on the 850 level. If they do tbat, the probability is that they will go far enough west to be in the ground originally helonging to the companies from which Con. Virginia and California were formed. It is a well-known fact that the bonanzas which they discovered, and have heen working out, had nothing to do with those mines as originally located. Those companies went far to the east and sunk their shaft into separate and distinct bodies of ore from tbat belonging to the so-called Comstock lode. As the original locators of east ore hodies had not the means with which to contend for them, they appropriated them, as they will continue to do if they find any still farther east, although they may have to drift through hundreds of feet of syenite rock to reach them. This aggressiveness on the rights of others, practiced hy the Comstockers, has heen a very nnjust thing, but on the principle on which they act, that might makes right, the weaker party have had to succumb. I shall have more to say on this subject at another time.

J. D.

Virginia City, Mar. 25th.

Mining Notes from Siskiyou County.

Editors Press:—The miners are generally hard at work, I believe—at least all the creeks and old Scott river show the effects of mining in their muddy waters. We have some encouraging reports from our quartz mines; extra good prospects and some big honauzas are reported. One of my neighhors, Mr. H. C. Cory, informs me that they have struck a good prospect, to say the least, in one of their tunnels on French creek. They think it will average $30 per ton. I hope it may last, and prove to be, indeed, a perfect honanza.

I am of the opinion that there are good mines in this neighborhood, and that the near future will prove them to bs so. The main drawhack heretofore has heen, that the parties trying to develop these mines were farmers, with work enough at home in the dairy and on the farms to occupy their time and require their whole attention; and also they were lacking in cash. This latter article we all know to he very essential in mining. It is true that here, at home, these mines are generally considered helow par, hut what of that? If their owners are said to he fanatics on the mining question, the claims (for they are really nothing hetter, never having heeu developed into mines yet, strictly speaking,) prospect well, and although they have heen prospected for a numher of years, and a large amount of hard lahor, hesides a considerahle quantity of money has heen expended upon them, yet not judiciously. An inexperienced man cannot do as mnch in this line with a year's work and $1,000 cash, as a competent man of experience can do, or accomplish, with one-third as much.

John Daggett worked a long time, met with every discouragement, yet struck a honanza at last, and one that seems likely to last. So, too, the Quartz Valley mines, Dick Johnson and many others, are only ahout 15 miles northwest of here. They prospected and worked for years in the face of every opposition. and though their neighbors and other "knowing ones" cried "hust," "no account," etc., yet to-day, after the mines are open, they are proving successes, some of them grand, excelling the most sanguine expectations of the owners. I promised Mr. Cory that I would visit his mines soon, and write what I may see with my own eyes. I do not helieve in exaggerating or "stretching the hlanket" too far; it has caused more injury than it accomplishes good. I could find items enough to send in, to fill the whole of the Press, but I don't wish to place anything over my name that I am doubtful about, or that I believe to he false: I had rather say less and be sure of the correctness of that little. There is one thing I do think, and that is, that this county is destined to stand high among the mining countics of the State at no very future day. We need men of capital and experience, comhined with industry and ambitiou. I think the Press should he better patronized by the people, and truthful accounts and items handed in to the different local and traveling correspondents—everything of interest, in fact, for publication. I am sure we will, any of us, take the time to write them up.

R. D. Nunnaly.

Etna Mills, March 3d.

Renewal of Files by the Sand-Blast.—Notwithstanding the doubts which have been thrown out in regard to the practicability of re-sharpening files by the use of the sand-hlast, the application of the principle seems to he giving good satisfaction in Europe, if we may give credence to the following paragraph, which we clip from the *La Gaceta Industrial:* "The application of Tilgbman's sand-blast to the restoration of worn-out files, is hecoming very general in Europe. A file of moderate dimensions requires only three or four minutes for renovatiug. The process can be repeated many times hefore the files need to he recut, and tbe sand-hlast sharpening lasts six times as long as any other. The sand should he very fine and driven with great velocity."

Modified form of Locomotive Boiler.—Mr. Verderber, of the Hungarian State railways, has made some interesting experiments with a modified form of locomotive hoiler, as a means of avoiding the expense of frequent repairs of the fire-box of the locomotives used hy him, which were rapidly destroyed in consequence of sediment from bad feed water. He found by actual comparative trials that the fire-box is superfluous as a steam-generating part of the hoiler. He found it possihle, therefore, to replace the fire-hox hy a comhustion chamber lined with fire-proof material.

Heat on Wrought Iron and Steel.—It is said that the effect of heat on steel is quite different from that on wrought iron. If a piece of cast steel be made red-hot and is quenched in cold water it will become longer, but if the same operation he performed upon a piece of wrought iron it will hecome shorter. The precise amount of the alteration, or its variation in different qualities of each metal, has never heen determined, although it is of great importance in work-shop manipulations.

Forest Preservation on the Pacific Coast.

That we have not ignored nor seemed indifferent to the importance of duly guarding the timber lands of Californuia, and, indeed, of the entire Pacific coast, from unnecessary waste, ws need not assure the readers of the Press. That we have ever hesn alivs to the momsntous character of this question, discussing it with fulness and an appreciative sense of its magnitude, our columns amply attest.

Sir J. D. Hooker, the distinguished English hotanist, who visited this coast last year, has since his return home written a letter to Mr. Gray, one of the Yosemite Commissioners, giving it as his opinion that the most disastrous consequences must follow the destruction of the forests in this State, aud throughout the great interior basin lying to the east of us. The ahility to continue the production of our fruit and cereal crops depends, says this eminent scientist, upon au ahundant and uninterrupted water supply, which in turn is contingent upon the conservation of our redwood forests near the sea coast and those on the western slopes of the Sierra Nevada. The destruction of these forests in whole or in large part will suhject the State alternately to disastrous floods, and still more disastrous drouths, to say nothing of timber supplies cut off. In taking measures to guard against these dire results it will not suffice that the trees over small areas are preserved if the great hody of the forests themselves are destroyed. Unprotected from the elements these small patches would become the prey of parasites, he attacked hy disease and perish also in the end. As a preventive measure, this gentleman suggests the adoption of a system of forest-felling hy selection, the same to he placed under State supervision, after the plan adopted hy the English government in India and elsewhere.

Prof. Sargent, Director of the Botanic Garden of Harvard Uuiversity, puhlishes in the *Nation* a still more extended article on this suhject, copied in our last issue, and to which we need hut refer the reader. Emauating from such authoritative sources, and coming to us in this shape of hoth a protest and appeal, these statements of Sir J. D. Hooker and Prof. Sargent command our earnest attention, and we should see to it that the government, both State and National, take early action for averting these predicted calamities. As yet the title to most of our forests lands remains in the general government.

While the destruction of timher on this coast has been rapid and sufficiently wanton, it has not been so great perhaps nor so criminally wasteful as many suppose. Our cities and towns, mostly constructed of wood, have, through many conflagratious. beeu compelled to a frequent rehuilding. In San Francisco street and sidewalk planking, hlock paving and wharf huilding bave heretofore consumed much lumber; more a good deal than will probably be required for these purposes in the future. In the mining districts buildings of nearly every description have from the first been made of wood, those erected in the earlier days being mostly composed of logs and shakes, the latter a very wasteful mode of employing lumher to such end, and one that has led to generally exaggerated notions as to the reckless habits of the primitive miners and lumbermen in this particular. These shakes, a long thick style of shingle, split from the sugar pine, abont the most valuable wood that grows in our California forests, were used for both covering and enclosing huildings. Now it was the practice with these men, if after felling a tree it did not split well, to leave the same and cut down another, so keeping on until they found one to suit them. The sight of these noble trees so left to rot where they fell excited afterwards an amount of indignant comment that caused many to think they had been destroyed through sheer wantonness. And one of these old-fashioned log cabins took timher enough if sawed into hoards to build two or three good-sized houses. The use of iron pipes instead of lumher for flumes, and of worn-out rails instead of blocks for paving sluices, to say nothing of the much more general substitution of iron and other material for wood, must hereafter everywhere tend to diminish the consumption of the latter, lessening to that extent these drafts upon our California forests.

But the great objection to cutting dowu the forests in this State is not based so much upon a prospective scarcity of lumber as upon the injury it will work our agricultural, mining and other great industries. In the woods of Oregon, Washington Territory and British Columbia, to say nothing of Alaska, we have timher preserves that, even with the heavy demands heing made upon them, must last for a long time to come. So great are our lumher resources in that direction, that they require no supervising care for the present. Nor here in California would precautionary measures become so necessary were it not that the tendency of the forests to reproduce themselves is likely to he suhverted by the herds of browsing animals turned out upon them, and which threaten to so increase that but few young trees will he spared hereafter.

Along the main timber belt of the Sierra where the forests have heen removed the young conifers spring up and, if not eaten off, grow with great rapidity and vigor. They will do so even in spite of the presence of neat cattle, horses, swine, etc., but it is doubtful if they can withstand the depredations of the sheep, to say nothing of the still more predatory and voracious goat, with which animals ths westerly slopes of the Sierra ars beginning to he thickly covered. It is the opinion of many close observers that there will he left not the slightest chance for these forests to renew themselves if either sheep or goats are permitted to pasture among them in large numhers. However this may be, such regrowth seems possihle whers only other kinds of stock are suffered to feed on these denuded forest lands. In support of this opinion the evidence is ample, trees of new growth stauding thick aronnd some of the oldest mining camps, and even in the vicinity of populous towns all ovsr this region. Take for example tbe country ahout Nevada City and Grass Valley, two of the earliest sattled as they are now the largest towns in the mining districts. These places are some five miles apart, and yet much of the land around and even right between them is covered with groves of splendid young pines, some of them a foot or more through at the hutt and from sixty to eighty feet high. No care has beeu taken to prevent stock of any kind from feeding on this land, the most of which lies in common, the trees on the enclosed and unenclosed portions appearing to have flourished alike. It is now about 20 ycars since the original growth of timber here hegan first to be cut away, the life of these new groves averaging about 20 years. As they stand very thick on the ground these groves, which already require thinning out, would afford a great deal of fuel, as in another 20 years they will afford suitable material for making lumher.

What is true of the land in the neighborhood of the towns here instanced, is true of the entire westeru declivity of the Sierra above and below certain levels. In the lower foothills and to an altitude of about 1,000 feet, the timber growth is confiued mostly to oak and two spscies of pine, the *Pinus contorta*, twisted pine, and the *Pinus sabianiana*, a scruhby nut-hearing tree, popularly known as the "Digger" or "Bull" pine. Once the first growth is hsre cut away the process of self-planting goes on not again or does so very slowly, this heing the case also as we approach the upper timber line, which in these mountains varies in hight from 9,000 to 11,000 feet. Throughout the whols intermediate space, however, along the west face of this range, a belt varying from 50 to 100 miles across and some 500 miles in length, ths young trees, upon the removal of the old stock, sprout up and grow in the most thrifty manner, as they will continue to do, no doubt, if protected from the ravages of domestic animals, and perhaps also without such protection, observers not being agreed on this point. If sheep are so destructive to the young trees as some have feared, it is a little singular that ths new growth should have made such progress in these early settled and populous neighborhoods, where many of these animals must have heen kept if for no other purpose thau the shambles, and where as is well known no care has been taken to keep them off these land. However this may he, certain it is that Nature, if we give her a fair chance, will do ths replanting here and bring forward the new crop of spruce, cedar and pine without any aid or supervision on the part of man. But we must see to it that she is not defeated in her beneficent and self-imposed task. It will he to little purpose she essays the practice of her forestry if we carelessly neglect to second her efforts or criminally interfere to defeat them. If it shall be found that sheep and goats or any other class of animals are likely to destroy the young trees or in any way prove detrimental to their growth, thcre would have to bs measures adopted to regulate the matter.

In the great interior valleys of California tres culture has begun, and will soon reach such dimensions as will more than repair any damags they may have sustained through the cutting down of the primitive growth of timher thers, which never was great. As for the State of Nevada and most other parts of the great basin, their timher growth is too sparse and stunted to he worth considering in this connection. From the eastern base of the Sierra Nevada to the Wasatch range, a distance of 600 miles, ths only trees to be found, excepting a few worthless cottonwoods along some of the rivers, consist of a species of scrubby pine and juniper scattered sparsely along the mountain sides, with here and there a grove of white pine, also a scrubby sort of tree but large enough to make a poor kind of lumber. To talk of preserving these trees where there exist such stringent necessities for their use, or to consider them with reference to their climatic effects, would he idle. Without using this timber, poor as it is, the mines could not he worked, while it is altogether too stunted and sparse to exercise any appreciable influence upon the rainfall or other meteorological feature of the country. For the puhlic authorities to attempt any interference looking to its preservation would he useless; all that should he attempted in that direction being to experiment with a view to finding the species of tree best adapted for culture in these arid mountains, valleys and widspread plains, and, when found, to plaut it as extensively as possible.

Telegraphing to Running Trains.—C. M. Gariel describes the successful working of Baillehache's invention for signalling to and from trains in motion, on a part of the line which connects the Champs de Mars with the station at Grenelle. The experimeuts were so successful that they are likely soou to be repeated on a much larger scale.—*La Nature.*

MECHANICAL PROGRESS.

Two Great Fairs.

There are two great international exhibitions approaching which should receive the attention of Pacific coast manufacturers and producers. The countries now preparing for them lie near this coast, commercially speaking, and to make a good impression upon those engaged in developing the resources of those countries, will go a good way toward securing a profitable trade for the manufactures which are made best on this coast. The influence of large industrial expositions upon the development of export trade is much more widely recognized now than before the holding of our centennial display at Philadelphia. Exhibitors at that exposition have heard from the uttermost parts of the earth, and American machines and manufactured articles have secured introduction in many countries which before had thought that only England and the Continent of Europe could supply their needs. Among other countries which had their eyes opened to the desirability of American manufactures was Australia, and the disposition of favor toward our manufacturers is now quite prevalent in the island colonies. California will share largely in this feeling. In fact the Australians keep a sharp eye on the progress of industrial methods and appliances on this coast, that they too may profit by any real improvement which may be made here. Nor are other classes of machinery neglected. We read the other day that one of the Australian colonies had appointed a commissioner to come to this coast and study the boring of artesian wells, and purchase an outfit of the best tools, for use there on experiments under the auspices of the government. These are but few of the many indications that there may be a great future for trade in our productions with Australia—a trade which has already reached respectable proportions in some lines of produce and merchandise.

These facts naturally lead to mention of the Australian International exhibition which will be opened in Sydney, in August or September next. The managers invite the fullest exhibition of Pacific coast products. An acre of space has been set apart for the United States. No charge will be made for space, and if early notice is given motive power will be supplied. The preparations for the exposition are going forward rapidly and on a liberal scale, the drawings of the buildings which we have seen, representing imposing and well planned structures. There is a point which will restrict exhibitions from this coast, and that will be the high rates of freight prevailing, but it would certainly seem to the interest of carrying companies to remove this obstacle or reduce it as much as possible, because displays of articles suited to local needs in Australia will lead to many shipments in the near future. It is a project in the realization of which these companies will share largely in the benefits and a liberal policy would seem wise.

Another international exposition which we would mention is one planned by the Mexican republic, and to be held in the City of Mexico in 1880. The Mexican republic has suffered severely during the last few years by various reverses. The distinguished Minister of the Interior, Riva Palacio, in his circulars announcing the exhibition, remarks that in harmony with the opinion of many distinguished citizens, the Mexican Executive believes that the origin of the greater evils which, until now, the country suffers is an economical, rather than a political one, and that in order to check those evils, not only are the patriotic efforts of the good sons of Mexico required, but also the effective concurrence of foreign intelligence and capital.

The Executive believes that an international exhibition—the most proper means of bringing together the intelligent and enterprising men of all nations—must be favorable, by this mere fact, to the realization of the ends indicated. Foreign exhibitors, as well as those of the Mexican States, will be free to exhibit their articles in the buildings or pavilion raised by the governments of their respective nations or States, or in the common building for the exhibition, as it may suit their interests. The governments that maintain relations with that of the republic will be respectfully invited to send special commissioners to the exhibition. In due time the ports of entry for objects destined to the exhibition will be determined. These objects, in accordance with the regulations that the Department of Finance will duly issue, shall pay no duties, except in case of sale, and may remain exposed six months exempt from all local or warehouse charges. The Managing Committee will shortly publish in the Italian, English, French and German languages, and with the approval of this department, the necessary regulations for carrying out the exhibition in the most advantageous manner to the exhibitors and to the republic.

This is also a movement in which the Pacific coast States and Territories can with profit take a share, for if Mexican production, trade and progress revive, we shall be in the way to share its benefits. We have one of the most commanding commercial positions in the world, geographically; we should see to it that our advantages are employed to their fullest extent.

A Gigantic Ocean Steamer.

Ocean travel has not met with any important changes or improvements since the first introduction of large sea-going steamers. There has been no great improvement either in the mode of construction, speed or comfort of passengers on ocean steamers, since the establishment of the Cunard line between New York and Liverpool. But it cannot be supposed that in an age of invention, such as this in which we are now living, ocean travel must be the only exception to progress and improvement. At least this has been the opinion of one enterprising family—the Winans family, of Baltimore. Most of our readers have had more or less knowledge that for the last twenty years or more, the Winans brothers have been engaged in experiments on a most costly scale, looking to an important advance in the construction of ocean steamers for rapid transit.

Possessed of almost unlimited means and of the highest order of inventive and constructive genius, these gentlemen have never lost sight of this one object, and the public is now assured that they are about to enter practically upon their new mode of steamer construction. They have expended already over $3,000,000 in experiments alone, without receiving a dollar in return. So exhaustive and complete have been these experiments, and so well assured are they of success that the first steamer which they will build will be upon the most gigantic scale—far exceeding the dimensions of the *Great Eastern*.

One of the chief features of novelty in the Winaus' steamer will be its cigar-shaped hull, which will be 1,200 feet in length—508 feet longer than the *Great Eastern*. It will have engines of 100,000 horse-power, and will be propelled by two screws under the after quarter of the vessel. The average speed, based upon most extensive practical experiments, and the most thorough scientific calculation, will be 23 miles an hour.

Another important and novel feature will be a tower 150 feet high, containing in part staterooms looking out on circular balconies, but having within a hollow cylinder vertically throughout its entire length and traversed by an immense weight susceptible of being adjusted at any desired hight. The effect that this tower produces upon the motion of the vessel is precisely the reverse of that which one would most readily infer. When "scaled" to a proper hight, in proportion to the "beat" or motion of the waves prevailing, it absolutely prevents all rolling. The great length of this steamer will prevent pitching, so that, presuming it justifies the claims and expectations of the inventors, it should be very advantageous for purposes of ocean travel. It is designed for the trans-Atlantic mail and passengor service, and their port of entry in this country will be New London, Conn., of which a special survey was made three years ago with this view. Milford Haven is expected to be the port of entry for Great Britain.

That it will revolutionize ocean travel is the conviction of the Messrs. Winans, and on that conviction they have expended millions, and are about to expend still more, it being their intention to construct three other similar vessels as soon as that described shall have been successfully operated. The estimated cost of construction of these vessels is £1,000,000 sterling each, and it is confidently believed by the Messrs. Winans and many of their friends, that they will accomplish the passage of the Atlantic in less than six days at all seasons, and in spite of any weather which has been known as yet on that ocean.

New Light on Steel Making.

It would seem that the presence of more than one or two-tenths per cent. of phosphorus in pig iron is no longer to be considered, as heretofore, an insuperable obstacle to its conversion into ingot steel. It has been fully established that as much as 0.32% of phosphorus can be tolerated in very mild steel, and, as it is well known, large quantities of Martin steel made from old iron rails and pure pig have, by the aid of ferro-manganese, been manufactured on this principle. The difference between the cost of changing old iron rails, and that of using pure materials, is, however, in most localities not sufficient to cover the extra expense of using ferro-manganese.

It remained, however, an axiom with steel makers, that no removal of phosphorus could be hoped for in any direct steel process till it was announced from the Blaenavon iron works that there were means by which phosphorus could be removed with certainty and economy, and that intensity of temperature was no obstacle to its removal. In confirmation of the Blaenavon experiments, we learn that very important results have been obtained in Belgium with M. Ponsard's forno-convertisseur lined with one of the Blaenavon basic preparations. The maintenance of the necessary highly basic slag was effected by the addition of lime and a certain amount of ore, as prescribed by Mr. Thomas, the patentee of the process, who assisted at the operations. In the first cast of four tons, notwithstanding that the operations were conducted under very unfavorable circumstances, an analysis of the steel showed that 90% of the phosphorus contained in the pig had been removed. An examination of samples taken at intervals shows a progressive decrease of phosphorus in the bath and its transference to the slag; the amount of silica in the latter being kept at about 22%. A somewhat more basic slag is, however, generally preferred. The second cast gave very similar results. As the Ponsard apparatus is able to deal with pig very low in silicon there appears to be now no class of pig which may not be considered as available for the manufacture of steel. The only impurity which is not removed almost completely is sulphur, though this is eliminated to a considerable extent; fortunately, however, sulphur is readily removed in the blast furnace. We understand it is now in contemplation to regularly work the Ponsard converter in combination with the new basic process on the highly phosphoretic pig of Belgium and Germany. This will give an economy of from 30 to 50 francs a ton over the use of Bessemer pig, and give a fresh life to the drooping fortunes of the manufacturers of phosphoretic pig.—*Iron Age*.

SCIENTIFIC PROGRESS.

Progress of Electric Lighting.

Prof. Tyndall devoted one of his recent lectures before the Royal Institution of London to a brief review of the progress which is being made toward the practical introduction of the electric light. He commenced by saying that the electric light has been known for 70 years—as in 1808, and again in an improved form in 1810, it was shown to audiences at the Royal Institution. Sir H. Davy's carbon points "threw sunshine into the shade," and in 1808, 2,000 pairs of plates produced such heat from the current they gave that quartz and calcium were melted as wax. It was early known that to produce heat and light in a circuit there must be resistance. This was illustrated by a wire composed alternately of platinum, which resists, and of non-resisting silver, when on the passage of a current the platinum became dazzlingly white hot. A non-resisting copper wire will carry enough electricity to split a resisting oak tree. In the case of two carbon points this resistance causes the one point to waste with double the rapidity of the other. This is one of the two great obstacles to the general introduction of the electric light. The second is a more serious one, depending on an inexorable law of nature which demands an expenditure of force of one kind for the production of another.

Zinc may be burnt in air—that is, oxidized; it may be also "burnt" or oxidized in acidulated water; but it has to displace the oxygen from the hydrogen for this to occur, and four-fifths of the heat produced are used up in this process. So that when zinc is thus "burnt" only the remaining one-fifth is available. The rate of "burning" makes no difference; one ounce of zinc, for example, always gives out the same amount of heat. This "burning" of zinc, which had been used in the production of electricity, was an expensive fuel, and this seemed to be a very great drawback to the general use of the electric light.

In the year 1831 a discovery was made by Faraday—that of magneto-electricity. He showed that when the earth's lines of magnetic force are cut, an electric current is produced. Prof. Tyndall quoted Faraday's saying, that he would rather occupy himself in finding fresh effects than spend his time in exalting those effects. But it was the exaltation of those effects which he first studied in a simple way which has led to the present possibilities of our electric lighting.

In 1854, Werner Siemans, of Berlin, invented what is now known as a Siemans armature, in the working of which there is only the ordinary mechanical friction to be overcome. Working the machine by hand, the expenditure of muscular force becomes apparent as heat through the machine. But this and the Wylde and Gramme machines in the same way show that the external work falls short of the originating work.

Now, whatever electricity is, it is a swift carrier of heat. We have motive power converted into current, and then we can have current converted into motive power. For example, Sir William Armstrong has his electric light worked by a water wheel. The great advance on Faraday's spark of 1831, as to practical use, is the use of cheap fuel—coal—for obtaining through the steam engine the motive force required. All the various modifications of the light as now used depend on this. Prof. Tyndall gave a historical sketch of the various arrangements, beginning with that of Mr. Holmes in 1862. He said he did not believe that any fresh *scientific* discovery was needed to make the electric light of general application to large places. The scientific man knew what different natures of machines were required to do the different kinds of work to be done. It remained now for *mechanical skill* to carry out the work. In conclusion he pointed out the mistake of those who, like Cuvier, spoke with contempt of those whose practical skill carried to utility the experiments of the philosopher.

AFRICA AGAIN CROSSED.—A Portuguese explorer, named Pinto, has recently arrived at Transvaal in Southeastern Africa, having crossed the continent on an exploring expedition, traveling from west to east. The latitude of his course is not given, nor, as yet, any particulars in regard to his observations and discoveries. His route, however, must have been many degrees south of Stanley's route, and will, no doubt, add much to our rapidly increasing knowledge of the geography of Central Africa.

A New Light.

The English papers are largely discussing "a new light," which is now, however, only in the fact that it is an intensified gaslight. It is by some called "the albo-carbon light." This light consists in the use, as an auxiliary to common gas, of some properties of pure white carbon in the solid form of small cylinders; not much unlike in appearance to a stick of pure white candy.

The machinery required to adapt the feeder and enricher to an ordinary gas burner is extremely simple, and can easily be adjusted by anyone skillful enough to fill and trim an ordinary table lamp. Albo-carbon thus stands in favorable contrast with the elaborate machinery at present required for the production of the electric light. While it economizes the consumption and improves the quality of the gas, it involves no change in mains, meters or piping, or the general apparatus of gas service. In the case of single lights, the apparatus consists of a metallic chamber of spheroidal form, fixed at a slight distance from the burner. In this vessel the albo-carbon is placed, and the substance, becoming liquefied by heat, gives off an inodorous vapor, which mingles with the gas made to pass through the vessel, and produces a combination of illuminating power vastly superior to that of common gas. The enriching material is a form of naphthaline, and is clean, portable, and inexplosive.

The proprietors of the patent claim that albo-carbon causes no obstruction and leaves no residuum; and that the vessels in which it is placed may be replenished without the slightest fear of accumulating deposits, so perfectly exhaustive is the evaporation of the substance under heat. At a recent exhibition of the light near London, a variety of interesting photometric tests were applied to the light, and its power was gauged and measured under a variety of aspects, one of the most pleasant of which is its hue, which, while intensely brilliant, is cheerful and sunny, while the shadows cast by objects illumined by it are not of that dense darkness which contrasts so strongly with the moonlight brightness of the electric light. Gaslight, enriched by albo-carbon, is a warm, sustained, and steady light, not, however, calculated to fatigue the eye; but its value was made known most readily and most convincingly when the spectators passed from the brilliantly-lit eastern section to the main body of the building illumined by common gas, under which it presented an appearance of well-nigh murky dimness.

A NEW PHENOMENON IN STATICAL ELECTRICITY.—M. E. Duter, in a paper read before the French Academy in December, showed that when a Leyden jar is charged with either positive or negative electricity, its internal volume increases, and that this effect is a new phenomenon, unexplainable by either a theory of an increase of temperature or of an electrical pressure. The experiment was performed by means of a flask-shaped Leyden jar, with a long tube attached to its neck, and containing a liquid which served as the inner armature. The author's attention had been called to the fact that this phenomenon had been observed 10 years ago by M. Gori. His researches, just made public, leave no doubt of the accuracy of M. Duter's view, that the glass of the jar really expands. According to the theory of elasticity, the effect of an internal pressure in a hollow sphere is in the inverse ratio of its thickness. M. Duter, therefore, had three flasks made of the same volume, but of thicknesses of 4 mm., 0.8 mm., and 0.5 mm. respectively. They were filled with water and enveloped with tin foil. Each carried a capillary thermometer tube, in which the variations of the hight of liquid served to measure the changes in volume due to electrification. He found that these changes were imperceptible in the thick glass, very marked in the flask of mean thickness, and rose to 30 mm. in the thinnest. The variations in volume were very nearly in inverse ratio of the square roots of the thickness.—*Scientific American*.

A NEW PHONOGRAPH.—Mr. Johnson, Mr. Edison's chief assistant at his Menlo Park laboratory, has been for some time engaged in improving the telephone and the phonograph. He has accomplished what no other one has ever yet been able to do—in the recording by means of the phonograph of words transmitted by telephone with such success that they could be repeated by the speaking machine with sufficient distinctness to be understood. This was, of course, done by the employment of Edison's new electro-motor receiver, the only instrument yet devised that delivers sounds with sufficient power for the purpose. Mr. Johnson has also nearly completed the invention of a new phonograph which he claims will be adapted to the practical use of business correspondence, and the possibility of recording telephonic messages, as proved by yesterday's experiment, will greatly extend the uses of the phonograph for business purposes.

A TELEGRAPHIC WRITING MACHINE.—The London papers state that an entirely new telegraphic system of writing has been devised by Mr. E. A. Cowper, a civil engineer of that city. In writing, ordinary characters are used at the transmitting end of the line, and no receiving clerk is required in close attendance, or for the purpose of noting or translating the message. It is a real telegraphic writing machine. The writer in London moves his pen and simultaneously at Brighton another pen is moved as though by a phantom hand, in precisely similar curves and motions.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 13.		Week Ending Mar. 20.		Week Ending Mar. 27.		Week Ending Apr. 3.	
Alpha	19⅝	18	21¼	19¼	19¼	16¼	18⅛	17
Alta	5⅜	5	6⅜	6¼	5.90	5	5⅜	4½
Andes	50c	40c	50c	40c	40c	35c	40c	....
Alps	....	....	....	....	....	....	....	....
Argenta	1.35	1.10	1.45	1.30	1.10	90c	1	....
Atlantic	..	....	....	....	....	....	....	....
Aurora Tunnel	....	....	75c	....	....	....	....	....
Baltimore Con	....	....	1	....	1	....	1	90c
Belcher	9	6⅜	9⅜	8⅜	8¼	6¼	8¼	6
Belmont	1	40c	70c	50c	50c	40c	45c	40c
Best & Belcher	19½	17⅞	21⅜	18⅜	17½	15	16⅞	15
Bullion	6	5¼	6⅜	5⅜	5⅜	4½	5½	4.95
Bechtel	75c	60c	2.60	1.20	2.15	1.70	1.90	1½
Belle Isle	35c	30c	35c	....	35c	30c	35c	30c
Bodie	6¼	5¼	6⅞	6⅛	7⅝	6	7	6¼
Benton	4.20	3⅜	5	4	4.20	3	3½	3
Bulwer	18	15	17	16½	17	15½	16½	15½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2⅝	1.60	4½	2½	4	2½	3½	3.20
Belvidere	65c	60c	75c	50c	2	1.45	1½	1.30
Booker	1	60c	1	80c	65c	60c	70c	50c
Caledonia	3.20	2.70	3½	2.70	2.65	2.10	2.55	2.10
California	6	5⅜	6	5⅜	5⅜	4.80	5½	4.90
Challenge	3½	2.65	3.65	3	3.20	2.10	3	2½
Chollar-Potosi	45	39½	51	45	43½	35½	46½	42
Comanche	....	....	....	....	....	....	....	....
Confidence	15½	13	18½	15½	14⅞	10	14	11
Con Imperial	1.40	1	1.60	1.35	1.35	1.05	1.35	1.05
Con Virginia	5⅝	5½	6	5⅜	5½	4.60	5⅜	4.90
Crown Point	6⅜	4.90	7	6⅜	5⅞	4½	5⅜	4½
Con Washoe	....	....	....	....	....	....	....	....
Champion	25c	20c	50c	25c	40c	25c	40c	15c
Concordia	....	....	50c	20c	15c	....	25c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	10c	....	5c	....	5c	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	35c	30c	30c	20c	30c	25c
Eureka Con	28	27½	27	24	22	18½	19	15⅞
Exchequer	5½	4⅞	5⅞	5	4½	3½	5	4.80
Endowment	5c	....	5c	....	25c	5c	30c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	5¼	4.55	4.60	4½	4.30	4	6⅜	3.35
Gila	30c	....	30c	25c	30c	....	....	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	58c	50c	10	9	9½	....	10	9
Goodshaw	55c	25c	1¼	45c	70c	50c	55c	45c
Gould & Curry	10⅝	9¼	12¼	10½	9⅞	7	8¼	7
Hale & Norcross	17	14	18½	16	13½	9⅜	11⅛	10¼
Hillside	2.60	2½	2⅜	2⅜	2¼	1⅞	1⅞	1
Highbridge	60c	55c	60c	50c	50c	40c	45c	35c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	20c	15c	20c	....	20c	15c
Independence	1.90	1.60	1.85	1.70	1⅞	1.60	1.60	1½
Julia	5⅜	5½	5⅞	5¼	4⅜	4	4.30	3.80
Justice	4.30	4	4⅛	4.10	3.80	3¼	3.85	3.20
Jackson	8	7⅞	7½	7	5¼	6	7	6
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5⅜	4⅞	6⅛	5¼	5	4½	5	4½
Kossuth	15c	....	....	....	15c	....	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.30	1.10	1.55	1.20	1½	60c	1.15	80c
Lady Wash	1.20	1.10	1.65	1½	1⅛	1	1.10	1
Leopard	80c	75c	90c	80c	1⅛	85c	1	50c
Leviathan	35c	25c	35c	30c	30c	20c	30c	20c
Leeds	70c	....	60c	50c	75c	60c	60c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	50c	25c	85c	30c	25c	....
Modoc	10c	....	55c	10c	....	....	....	....
Manhattan	1.60	1½	2	1⅜	1.80	1½	1⅛	1.10
Martin White	7	6⅞	7	6⅜	6⅜	6	6⅜	5⅜
McClinton	80c	60c	2½	95c	1.30	1	1.30	1.10
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	41	36½	41⅜	37½	35½	24½	33⅞	29
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	3	....
North Con Virginia	13	10½	11½	9⅞	9⅞	7¼	9¼	7⅝
New York	50c	25c	60c	40c	80c	55c	80c	60c
Northern Belle	10½	9⅞	11¼	10⅞	10⅞	9½	10	9½
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	25c	40c	30c	35c	30c	25c	....
Occidental	....	....	....	....	....	....	....	....
Ophir	37	34⅞	36¼	33¼	31	24½	24⅞	20¼
Oriental	10c	5c	25c	5c	75c	55c	60c	55c
Overman	12⅞	11½	14	11⅞	10⅞	9	11	9½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	2½	2
Phil Sheridan	40c	35c	40c	25c	35c	15c	20c	10c
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6⅝	6	6½	6¼	6¼	5½	5½	5
Richer	75c	65c	1	75c	70c	65c	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14	11	16	13½	11⅞	9¼	11¼	9⅞
Seg Belcher	27	25	36	30	....	....	....	....
Sierra Nevada	47	44⅞	49⅞	45½	47½	37	47	41¼
Silver Hill	2.20	1.90	2⅜	1.90	1.80	1.30	1.60	1.35
Silver King	8½	8	8½	....	8	....	8	7½
Silver Prize	....	....	....	....	....	....	....	....
Succor	50c	40c	45c	40c	1	30c	65c	40c
Summit	2½	2	2⅜	2	2.40	2	2¼	2.05
Scorpion	1.60	1¼	1.35	1	1.80	1	1⅞	1.40
Solid Silver	50c	40c	45c	40c	40c	30c	35c	....
South Bodie	30c	25c	1	40c	50c	40c	35c	30c
South Standard	....	....	30c	5c	25c	15c	30c	20c
Star	60c	50c	65c	60c	50c	....	60c	50c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	1⅞	1.55	2.90	1.70	2.30	1.90	2	1⅞
Tiptop	65c	55c	80c	60c	1.05	75c	75c	....
Trojan	25c	20c	25c	20c	20c	15c	20c	15c
Union Con	76½	66	77	69	66½	53½	60	54½
Utah	18	13½	20	17⅞	18	12	15½	13⅞
Vermont Con	....	....	....	....	....	....	....	....
Ward	1⅞	1.40	1.70	1.40	1.35	1	1.20	95c
Wells-Fargo	15c	5c	20c	15c	10c	....	15c	10c
Woodville	....	....	25c	....	....	....	15c	....
White Cloud	....	....	....	....	1	....	....	....
Yellow Jacket	20	16⅝	20⅞	17½	16	11½	14⅞	13½

Sales at S. F. Stock Exchange.

Friday A. M., Mar. 28.
150 Alta...5¼@5⅜
50 Andes...40c
170 Best & Belcher...16@16¼
195 Bullion...5¼@5½
500 Belcher...8@8¼
50 Benton...3½
245 California...5⅜
310 Crown Point...5⅜@5¼
1620 Con Imperial...1.35
280 Caledonia...2.35@2¼
70 Confidence...14
380 Challenge...3@2.90
5 Chollar...42
1085 Con Virginia...5¼@5⅜
150 Dardanelles...1¼
280 Exchequer...5@4.80
50 Flowery...50c
890 Gould & Curry...8½@8
305 Hale & Nor...11½
40 Justice...3.60
445 Julia...4.20@4¼
100 Kentuck...5
430 Lady Bryan...1.10@1.15
110 Lady Wash...1
60 Leviathan...25@30c
1165 Mexican...31½@32
80 Mackey...3
200 Mt Dew...2½@2⅜
60 North Con Vir...9@9¼
335 N Bonanza...1½@1.40
800 New York...75@80c
30 Overman...11
400 Ophir...24⅞@24⅜
120 Sierra Nevada...45
465 Savage...11½@11¼
205 Silver Hill...1½@1.60
400 Solid Silver...35c
625 Succor...60@50c
2015 Scorpion...1¼@1⅜
1390 Trojan...15@20c
150 Utah...15¼@15½
60 Union Con...57½@58
150 Ward...1.20@1.15
870 Yellow Jacket...14⅞@14⅞
AFTERNOON SESSION.
975 Argenta...1
200 Albion...25c
150 Belmont...40@46c
1130 Bechtel...1.60@1.55
115 Bodie...6⅜
370 Belvidere...1.70@1⅞
25 Bulwer...16⅜
300 Black Hawk...3⅜
700 Belle Isle...35c
650 Booker...70@60c
150 Champion...35c
300 Caledonia (B H)...1.90
2000 Concordia...25c
100 C Pacific...2.20@2.15
410 Dudley...70c
400 Esmeralda...1
580 Eureka Con...16@15⅝
4100 Endowment...30c
500 Fourth of July...25c
850 Goodshaw...50@55c
505 Grand Prize...4@3.65
200 Giant & O A...5
25 Hamburg...50c
50 Hillside...1⅜
75 Highbridge...45c
200 Independence...1½
300 Jackson...6@6¼
1000 Jupiter...50c
300 Leopard...1
500 Martin White...6⅜@6
450 McClinton...1¼@1.20
890 Mono...3@3.05
50 Manhattan...1½
60 Northern Belle...10@9⅞
50 Navajo...25c
150 Noonday...1.40
700 Oriental...60c
350 Paradise...1.85@2
50 Raymond & Ely...5¼
550 Rustler...40@45c
100 Star...60c
500 S Bodie...35@30c
450 Summit...2.05@2.10
650 S Bulwer...65@60c
1000 S Standard...25@20c
200 Silver King...8
905 Tioga Con...1.90@1.80

Saturday A.M., Mar. 29.
95 Alpha...18¼
90 Alta...5⅜
200 Argenta...1
120 Best & Belcher...16@16¼
765 Belcher...8@8¼
345 Bullion...5⅜@5¼
380 Booker...70c
240 Bodie...7
50 Bulwer...16
870 Belvidere...1.45@1.60
500 Bechtel...1⅞@1.90
150 Belmont...45@40c
500 Black Hawk...3½
870 Con Virginia...5@5¼
265 California...5
60 Confidence...13½@13⅞
175 Chollar...46@46½
690 Crown Point...5@5¼
840 Con Esmeralda...1@75c
220 Con Imperial...1.30
200 Champion...35@40c
165 Caledonia...2¼@2.55
250 Dardanelles...1¼
100 Dudley...70c
1010 Exchequer...5
180 Eureka Con...16¼@17
300 Flowery...60@65c
420 Gould & Curry...8@8¼
850 Grand Prize...3¼@6⅞
200 Giant & O A...5
700 Goodshaw...55c
200 H & Norcross...11⅞@11⅞
390 Hussey...20c
50 Hillside...1⅞
100 Highbridge...40c
350 Independence...1.60
280 Justice...3.70@3⅞
175 Julia...4.30
50 Jackson...6¼
100 Jupiter...50c
135 Kentuck...4⅞@4.90
400 Leviathan...25c
580 L Bryan...1@1.10
100 Leopard...75c
1010 Mexican...32⅞@33¼
30 M White...6¼
3670 Mono...2⅞@3½
360 McClinton...1.20@1.30
140 Mackey...3.10@3
50 Mountain View...3
115 Morning Star...1¼
340 Manhattan...1.10@1¼
200 New York...60c
110 N Con Virginia...9
470 N Bonanza...1.30@1.35
20 Northern Belle...9⅞
150 Noonday...1½
300 N Noonday...40c
330 Ophir...24@24½
20 Overman...10⅞@11
475 Phil Sheridan...15@20c
130 Raymond & E...5¼
20 Real del Monte...2.60
230 Savage...10¼@10⅞
445 Succor...60@65c
355 Sierra Nevada...46@47
390 Silver Hill...1½@1.55
500 Solid Silver...35c
735 Scorpion...1.60@1.70
200 Santiago...1
310 S Bulwer...70c
80 Silver King...8
250 South Bodie...35c
130 Summit...2.10
600 S Standard...25@30c
500 Trojan...20c
100 Tiptop...75c
800 Tuscarora...5c
925 Tioga...1⅞@2
250 Union Con...60
60 Utah...15½
700 University...45c
610 Ward...1.20@1.15
385 Yellow Jacket...14⅞

Monday A. M., Mar. 31.
620 Alta...5¼@5½
145 Best & Belcher...16@15½
625 Belcher...7½@7¼
300 Baltimore Con...1
485 Bullion...5⅛
280 Benton...3.40@3¼
410 Chollar...46@45
540 California...5
615 Con Virginia...5@5¼
270 Crown Point...5
3745 Con Imperial...1.10@1.05
140 Challenge...3@2.90
445 Caledonia...2¼@2.10
365 Confidence...11@12
485 Exchequer...4.95@5
100 Flowery...65c
100 Gould & Curry...7½
450 Hale & Nor...11⅞@11
300 Julia...4@4.05
140 Kossuth...10c
510 Lady Bryan...1.10@1
800 Leviathan...25c
100 Lady Wash...1.10
845 Mexican...32@30⅞
230 Mackey...3½@3.15
100 Mt View...3
200 New York...65@70c
100 North Con Vir...8½@8⅞
400 N Bonanza...1¼
1065 Ophir...24¼@23½
230 Overman...10¼
200 Phil Sheridan...15c
600 Solid Silver...35c
360 Savage...10¼@10¼
310 Sierra Nevada...45½@44
425 Silver Hill...1½@1.40
100 S Potosi...2⅜
70 Succor...55c
205 Scorpion...1.40@1.45
30 Utah...14⅞
460 Union Con...59@58⅛
100 Woodville...25c
285 Ward...1.05@1.10
1235 Yellow Jacket...14½@14⅛
AFTERNOON SESSION.
700 Argenta...1
400 Belmont...45@40c
405 Bodie...6¼@7
1135 Bechtel...1⅜@1.70
300 Booker...85c
770 Belvidere...1.60@1.40
50 Sulwer...15½
50 Black Hawk...3.35
1050 Champion...35c
410 Con Pacific...2¼@2.20
5 Caledonia (B H)...1.90
250 Dudley...65c
250 Day...30c
365 Eureka Con...17⅞@18
670 Endowment...30c
500 Esmeralda...1½@1.20
600 Grand Prize...3½
180 Golden Terra...9@10
500 Goodshaw...50@45c
950 Giant & O A...4⅝
25 Hussey...20c
200 Hillside...1
300 Highbridge...40c
300 Independence...1½
250 Jupiter...50c
50 Jackson...7
300 Leopard...50c
200 Leeds...60c
80 Martin White...5⅞@5½
785 Mono...2⅞@2.80
150 McClinton...1.10
40 Manhattan...1.35
500 Navajo...25c
550 Noonday...1⅞@1½
400 N Noonday...40c
235 Paradise...2@1.80
150 Phenix...2½@2¼
100 Real del Monte...2.90
75 Raymond & Ely...5¼@5½
250 S Bulwer...80c
290 Summit...2.20@2¼
400 S Standard...20c
300 Silver King...8
820 S Bodie...35c
200 Star...60c
100 Tuscarora...5c
150 Tioga Con...1.85@1.80
500 Tiptop...75c
1600 University...40@45c

Tuesday A. M., Apr. 1.
175 Alta...4.80@4.70
50 Alpha...17¼
125 Best & Belcher...15½@15½
2575 Belcher...6@6¼
300 Baltimore Con...90c@1
1160 Bullion...5½@4.95
60 Benton...3
275 California...5@4.95
55 Caledonia...2¼
160 Con Virginia...4.95
575 Con Imperial...1¼@1.20
295 Chollar...44@43½
485 Crown Point...4.60@4½
310 Confidence...12¼@12⅞
300 Challenge...2.90@2⅞
1270 Exchequer...4.95@4.60
100 Flowery...60c
940 Gould & Curry...7@7¼
530 H & Norcross...10¼@10⅝
390 Justice...3¼@3.20
250 Julia...3.90@3.80
70 Kentuck...4.65@4.60
180 Lady Bryan...1.10@1
630 Lady Wash...1@1.05
300 Leviathan...25@20c
750 Mexican...29@30
70 Mackey...2.90
50 Mt View...2⅜
20 Morning Star...3
150 New York...65@70c
300 North Con Vir...7⅞@7⅝
720 N Bonanza...1¼@1.15
440 Ophir...20½@20¼
70 Overman...9¼@9⅞
470 Phil Sheridan...20@15c
325 Sierra Nevada...42½@42
175 Savage...10@9⅞
100 Silver Hill...1⅜@1.40
60 Scorpion...1½@1.55
130 Solid Silver...35c
525 Trojan...20@15c
95 Utah...14¼@14
60 Union Con...57
600 Wells-Fargo...10c
580 Ward...95c@1
20 Woodville...15c
230 Yellow Jacket...13⅞@13⅞
AFTERNOON SESSION.
250 Albion...30@35c
410 Argenta...1
90 Booker...60c
195 Bodie...6⅜@7
195 Bechtel...1⅝@1.70
1440 Belvidere...1.40
60 Bulwer...16¼
250 Belmont...40c
200 Belle Isle...30c
605 Black Hawk...3¼@3.20
75 Concordia...25c
240 C Pacific...2.20@2⅛
370 Dudley...70@65c
440 Eureka Con...19@18¼
500 Esmeralda...1¼@1.15
615 Endowment...30c
400 Giant & O A...5@4⅞
1150 Goodshaw...50@45c
250 Grand Prize...3.60@3.35
800 Hussey...15c
700 Highbridge...40@35c
60 Independence...1½
200 Ida...50c
540 Jackson...7
300 Jupiter...50c
40 Leopard...50c
570 Manhattan...1½
90 M White...6
50 May Belle...25c
350 Mono...2.70@2.65
300 Navajo...25c
400 Noonday...1⅜@1½
200 N Noonday...45c
700 Oriental...60c
100 Phenix...2
440 Paradise...1.90@1.95
70 Raymond & Ely...5
50 Real del Monte...3
200 Star...55c
350 S Bodie...35c
240 Summit...2¼@2 20
690 S Bulwer...80@90c
200 South Standard...20c
100 Silver King...7½
255 Tioga Con...1.85@1⅞
600 University...50@55c

Wed'sday A. M., Apr. 2.
20 Alpha...17¼
80 Alta...4½
100 B & Belcher...15⅞@15⅛
340 Bullion...5⅛@5
1090 Belcher...6¼@6¼
460 Benton...3
185 Chollar...44@45
565 Con Virginia...5@4.90
270 California...4.95@4.90
940 Crown Point...4.65@4½
300 Caledonia...2.10@2.15
500 Con Imperial...1.20@1¼
10 Confidence...12½
770 Dardanelles...1.30
670 Exchequer...4.85@4.60
415 Gould & Curry...7½@7¼
650 Hale & Nor...10⅞@10⅞
120 Justice...3.40@3.45
450 Julia...3.95@3.90
90 Kentuck...4½@4.60
200 Leviathan...20c
500 Lady Bryan...80@85c
1040 Mexican...29⅞@30¼
100 Mackey...3@2.95
50 Mount View...2⅞
225 North Con Vir...8
400 New York...60c
385 N Bonanza...1½
200 Overman...9½@9⅛
500 Ophir...20½@21¼
1625 Phil Sheridan...15@20c
250 Succor...50@40c
75 Savage...10@9⅞
315 S Nevada...42@41¼
450 Solid Silver...35c
335 Silver Hill...1⅞@1.45
200 Scorpion...1.60@1.55
300 Trojan...15c
140 Utah...14
495 Union...56@54½
500 Wells-Fargo...15@10c
500 Ward...95c
420 Yellow Jacket...13⅞@13½
AFTERNOON SESSION.
550 Argenta...1
1010 Bechtel...1½@1.60
10 Bodie...7
60 Belmont...40c
495 Black Hawk...3½@3.40
200 Belle Isle...30@35c
950 Booker...50c
1680 Belvidere...1½@1.30
250 Champion...35@30c
120 C Pacific...2⅛@2.20
100 Chieftain...15c
500 Caledonia (B H)...1.85
400 Dudley...60@70c
100 Day...25c
100 DeFrees...5c
200 Endowment...30c
900 Esmeralda...1¼@1.20
120 Eureka Con...18@16¼
3:0 Goodshaw...50c
100 Giant & O A...5
200 Hussey...15@20c
400 Hillside...1⅜
150 Independence...1½
500 Jupiter...50c
40 Leopard...50c
400 McClinton...1.10
320 Manhattan...1¼@1.20
110 M White...6
825 Mono...2.80@2.90
25 Northern Belle...9½@9⅝
450 Navajo...25c
900 Noonday...1½
200 N Noonday...45c
200 Oriental...55c
50 Phenix...2
260 Paradise...1.80@2
50 Real del Monte...2⅝
40 Raymond & Ely...5
500 Revenue...1
60 Star...50c
200 S Bodie...35@30c
25 Silver King...7½
50 Summit...2⅛
200 S Standard...25c
900 S Bulwer...85@90c
375 Tiptop...75c
245 Tioga Con...1⅝@1.80
200 Tuscarora...5c
300 University...50@45c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery st
Bechtel Con M Co	California	1	10	Feb 18	Mar 25	Apr 15	Wm H Lent	309 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Leopard M Co	Nevada	10	50	Mar 10	Apr 14	May 5	R H Brown	327 Pine st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Apr 19	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	Apr 7	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 27	Apr 12	J T McGeoghegan	316 Pine st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgomery st
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 16	O H Bogart	106 Leidesdorff st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 7	J M Buffington	309 California st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mammoth M Co	California	2	20	Feb 12	Mar 19	Apr 10	A W Rose	302 Montgomery st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomas	203 Bush st
Northern Light G & S M Co	California	3	10	Jan 23	Apr 10	Apr 28	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Oriental Con G & S M Co	California	2	50	Feb 18	Mar 24	Apr 11	Wm R Bentley	327 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Taul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Summit M Co	California	7	05	Feb 4	Mar 11	May 6	R N Van Brunt	318 Pine st
University G M Co	California	1	10	Mar 1	Apr 6	Apr 26	Wm Letts Oliver	328 Montgm'y st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Atlanta M Co	Utah	E B Jago	420 Montgomery st	Annual	April 6
Comanche M & M Co	California	W W Traylor	309 Montgomery st	Annual	April 7
Golden Gate Con H M Co	California	J T McGeoghehan	318 Pine st	Special	April 14
Modock Con M Co	California	J W Pew	310 Pine st	Special	Apr 7
Morning Star M Co	Nevada	Jas B Maholm	331 Montgomery st	Annual	April 29
Queen Bee M Co	California	T A White	113 Leidesdorff st	Special	April 15
Tioga Con M Co	California	W H Lent	309 Montgomery st	Annual	April 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Excelsior W & M Co	California	G P Thurston	315 California st		Jan 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Mar 20
Standard G M Co	California	W Willis	309 Montgomery st	1 00	Mar 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Mar. 27.
260 Alta...5¼@5⅜
280 Andes...40c
130 Alpha...19@19½
120 Best & Belcher...17¼@17⅜
1090 Belcher...8¼@8½
530 Bullion...5¼@5⅜
30 Benton...3.70@3.80
195 California...4.90@5
395 Con Virginia...5@5¼
770 Crown Point...5½@5⅜
60 Chollar...42½@43½
1655 Con Imperial...1.30@1.35
115 Confidence...14⅞
210 Caledonia...2¼@2.65
365 Challenge...3@3.20
480 Dardenelles...1@1¼
420 Exchequer...3.90@3.95
50 Flowery...60c
340 Gould & Curry...8½@8⅝
285 Hale & Nor...12¼
690 Justice...3.65@3.80
1145 Julia...4.15@4¼
255 Kentuck...5
800 Kossuth...15c
130 Lady Wash...1.10
300 Lady Bryan...1⅜
400 Leviathan...30@25c
750 Mexican...33½@33¼
250 Mountain View...2½
200 Mackey...3.10
125 New York...75c
185 North Con Vir...9⅞@9⅜
705 N Bonanza...1½@1.45
420 Ophir...26⅞@26½
145 Overman...11½@10⅞
900 Phil Sheridan...20@15c
295 Sierra Nevada...47½@46½
30 Savage...11⅞@11
230 Succor...90@80c
375 Silver Hill...1.80@1.65
485 Scorpion...1.80@1½
500 Solid Silver...35c
110 S Potosi...2½
150 Trojan...15c
330 Union Con...59½@58⅛
135 Utah...16¼@16
575 Ward...1¼@1.20
1245 Yellow Jacket...15⅞@15¼
AFTERNOON SESSION.
430 Argenta...1@1.10
50 Albion...35c
100 Belle Isle...30c
70 Bulwer...15¼@16
1000 Bodie...6@6¼
1550 Bechtel...1½@1.55
100 Belmont...40c
750 Belvidere...1.60@1⅞
500 Black Hawk...3½@3.60
750 Booker...65@75c
1608 Champion...30@40c
250 Concordia...25c
1000 Chieftain...15c
420 C Pacific...2.10@2.20
10 Caledonia (B H)...1.90
1600 Dudley...70c
3870 Endowment...30c
255 Eureka Con...15@16
270 Goodshaw...55c
370 Grand Prize...4@4.10
200 Gila...30c
20 Golden Terra...9
50 Hillside...1.80
850 Hussey...20c
550 Highbridge...45@50c
100 Independence...1.60
950 Jupiter...50@60c
100 Jackson...6
870 Leopard...1@1.05
100 Martin White...6¼@6½
340 Mono...2.05@2.10
155 Manhattan...1⅞
1220 McClinton...1.20@1.30
1540 Navajo...25@30c
440 Northern Belle...9⅞@10
650 Noonday...1½@1.60
400 Oriental...60c
1325 Paradise...1.95@2
50 Real Del Monte...2.80
200 Raymond & Ely...5½
200 Red Cloud...1¼
325 S Bulwer...65@75c
250 S Bodie...40c
100 Star...60c
20 Summit...2.0c
2350 S Standard...10@155
560 Tioga Con...1.85@1.90
300 University...40@50c

Thursday A. M., Apr. 3.
300 Alta...4.80@4.85
200 Alpha...17@17½
150 Andes...40c
140 Best & Belcher...15@15½
125 Bullion...5@5¼
650 Belcher...6⅛@6¼
320 Benton...3.10@3.20
410 Caledonia...2.20@2¼
935 Con Imperial...1.20@1¼
495 California...4.95@5
945 Challenge...2⅜@2.65
485 Con Virginia...4.95@5
100 Confidence...12⅞@12⅞
175 Crown Point...4.65@4.70
110 Exchequer...4.80
1195 Flowery...60c
455 Gould & Curry...7½
235 Hale & Nor...10⅞@10⅞
1245 Justice...8.70@3.85
120 Julia...3.90@3.95
100 Kentuck...4½
750 L Bryan...80@75c
150 Lady Wash...1.10
1650 Leviathan...25@20c
945 Mexican...31@31¼
280 Mackey...2.95@3
500 Margarita...10c
50 Mt View...2½
400 New York...65@60c
745 N Con Virginia...8@8¼
300 N Bonanza...1.10@1.20
250 Ophir...21⅞@22
260 Overman...9¼
550 Phil Sheridan...10@15c
80 Sierra Nevada...42@42½
260 Savage...10⅛@10¼
125 Scorpion...1½
145 Silver Hill...1.40@1.35
100 Succor...55c
1350 Solid Silver...35c
30 Utah...13¼@14¼
550 Wells-Fargo...10c
275 Ward...1@1.05
575 Yellow Jacket...13⅞
AFTERNOON SESSION.
920 Belvidere...90c@1¼
220 Bodie...8
1040 Bulwer...17
345 Black Hawk...3½
270 Bechtel...1½@1.55
900 Belle Isle...40c
550 Booker...50@80c
150 Belmont...40c
600 Caledonia (B H)...2.35
130 C Pacific...2.15@2.20
200 Champion...35c
450 Dudley...65c
600 Esmeralda...1.10@1.30
220 Eureka Con...18
370 Grand Prize...3½@3.55
200 Hussey...20c
600 Highbridge...40@45c
400 Independence...1½@1.60
225 Jackson...7
300 Jupiter...40c
200 Leopard...70@75c
1420 Mono...3½@3.30
330 Manhattan...2¼
550 McClinton...95c@1.10
30 Northern Belle...9½@9⅝
300 Navajo...15c
500 Noonday...1½
700 Oriental...55@60c
100 Phenix...2
100 Raymond & Ely...4⅞
200 Real del Monte...3
250 Revenue...1.10
100 Summit...2.20
725 S Bodie...40@35c
300 South Standard...20c
800 S Bulwer...85@90c
460 Tioga Con...1.70@1⅞
2200 Tuscarora...5c
350 University...40@45c

Pacific Board—Latest Sales.

Wed'sday A. M., Apr. 2.
40 Alpha...17
150 Alta...4½@4.55
600 Belcher...6¼@6¼
40 Bullion...5
40 Benton...3¼
70 Best & Belcher...15¼
100 Con Virginia...4.90
1090 Con Imperial...1¼
95 Crown Point...4.60@4½
70 California...4.90@5
45 Chollar...43¼@44
120 Exchequer...4.70@4⅞
95 Gould & Curry...7@7¼
220 Hale & Nor...10⅞@10¼
180 Justice...3.30@3.35
20 Julia...3.95
30 Kentuck...4¼
120 Mexican...29⅞@29¼
170 Ophir...20⅞@21
60 Overman...9
245 Savage...9⅞@10
30 Sierra Nevada...41
10 Silver Hill...1.30
10 Utah...14
20 Union Con...51¼
120 Yellow Jacket...13⅞
AFTERNOON SESSION.
45 Alta...4⅞@4½
230 Bechtel...1.70@1.60
110 Belcher...5@5.95
175 Belvidere...1.45
50 Bullion...4.90
310 Booker...50@55c
25 Benton...3.20
130 Caledonia...2.15
165 Con Imperial...1.20
40 Con Virginia...4.95
50 Crown Point...4¼@4.65
60 Gould & Curry...7@7¼
5 Hale & Nor...10¼
260 Julia...3.80
50 Mackey...2.85
40 Mexican...29⅞@29½
80 Mono...2⅞@2.95
100 Martin White...6
50 New York...62½c
20 Ophir...20½
20 Overman...9½@9¼
600 S Utah...9c
20 Silver Hill...1.40
100 Solid Silver...30c
10 Utah...13⅞
40 Ward...90c
300 Wm Penn...15c
500 Wells-Fargo...10@12c

California Board—Latest Sales.

Wed'sday A. M., Apr. 2.
30 Alpha...17
50 Alta...5@5.05
200 Atlantic...40c
500 Atlanta...5c
450 Ætna...5c
50 Best & Belcher...15½@15⅞
40 Belcher...6¼
30 Bullion...5
125 Boston...1½@1.20
100 Brilliant...25c
1000 Crevice...20c
40 California...5
30 Con Virginia...5@5.05
200 Con Imperial...1.20@1¼
80 Crown Point...4.80@4.95
110 Caledonia...2.20
30 Chollar...43½
85 Challenge...2.70@2⅞
40 Exchequer...5
410 Favorite...55c
30 Gould & Curry...7¼@7⅞
30 Hale & Norcross...10⅝
85 Julia...4@4.05
310 Leviathan...20@25c
40 Mexican...30¼
100 North Carson...8c
20 Ophir...21¼
500 S Utah...7@9c
50 Savage...10@10¼
50 Sierra Nevada...42@42½
60 Silver Jacket...90c
500 Twin Peaks...5c
30 Union...57
300 Wm Penn...10c
10 Yellow Jacket...13⅜
AFTERNOON SESSION.
100 Ætna...5c
110 Alta...4.60@4⅝
500 Atlanta...5c
50 Alexander...4½
50 Bullion...4.90@4.95
25 Belmont...45c
60 Best & Belcher...14⅞@15
60 Belcher...6@6¼
80 Caledonia...2.15
30 Con Virginia...4.95
60 Crown Point...4½@4.60
200 Con Imperial...1.20
40 California...5
30 Chollar...43½
170 Challenge...2.70
1000 Coso Con...5c
100 Enterprise...1
50 Exchequer...4⅞@4.80
800 Endowment...30@28c
200 G Deposit...75c
35 Gould & Curry...7⅛
50 Goodshaw...45c
40 Hale & Nor...10¼
130 Julia...3.85
90 Justice...3.40@3.45
130 Mexican...29@29¼
30 Ophir...20¼
10 Overman...9⅞
150 Phil Sheridan...16c
40 Savage...9¼
1550 S Utah...9@10c
30 Sierra Nevada...41
110 Tioga...1.90
120 Tiger...1¼
300 U Flag...5c
20 Union Con...54
100 Wells-Fargo...10c
100 Wales...1¼
50 Yellow Jacket...13⅛@13¼

The Mining Share Market.

This week has been a continnation of the disasters, dullness, and misfortunes of the last. There has been little or no life at all in the market. Prices have perhaps not been as low as those attending former panics, but never has there been less movement and more sluggishness than now. Beyond a doubt the election for the adoption or rojection of the proposed Constitution is to some extent affecting values and business, and so far as this influence does extend it must be expected to remain until the excitement attendant on the election is over and the uneasiness dispelled. The opening of the week showed a slightly better tone than prevailed at the close of last, but this soon shaded off as to prices and amount of custom, to the sickly condition noted above.

For several days there was an almost entire absence of business as well as fluctuations. The last day or two there was a faint streugthening and a little more briskness in the movements. Ophir, Mexican, and Chollar have been the most active aud Bodie stocks generally have attracted some attention. It has been understood for some time that the insiders were intending to strengthen their position with the stockholders by economy manifested in the cutting down of official salaries and reduction in the number of superintendents and foremen in the mines connected by drifts and levels. Flood & Mackay are reported to favor strongly this policy, recognizing how great an economy is necessary in prospecting the Comstock during the present year.

A Chance to Visit Shasta and Other Northern Counties.

Those who think of visiting the great northern region of the State during the coming season and viewing its magnificent scenery and boundless resources, will be interested in the announcement that special arrangements have been made by the Central Pacific Railroad with the C. & O. C. L. Stage Company, whereby they will be able to place on sale during "the season," commencing May 1st, (next), at their office in this city and at Sacramento, "*Special Excursion Tickets*," contract limited to 30 days from date of sale, at the following rates for the round trip:

No. Miles fr'm Reading.	To Station named and Return.	From San Fran'co	From Sacramento.
22	U. S. Fishery—Allens	24.50	19.50
44	Slate Creek	28.80	23.80
54	Southerns	30.80	25.80
64	Lower Soda Springs	32.80	27.80
65	Castle Rock	33.00	28.00
99	Upper Soda Springs	33.80	28.80
77	Strawberry Valley—Sissons	35.40	30.40

The "U. S. Fishery" is on the Cloud river, at the only point where that stream is touched by the stage road, and is two miles below the hotel at "Allens" station. Slate Creek, Southern's Lower Soda Springs, Castle Rock and Upper Soda Spriogs are on the Sacramento river. "Strawberry Valley" (Sissons) is at the base of Monnt Shasta. At "Sissons," Upper and Lower Soda Springs, guides and horses are provided for excursions to the summit of Mt. Shasta and to the salmon and trout fishing stations and "deer licks" on the head waters of the Cloud river.

"To Leadville and Death."—Under the above rather startling heading the Cheyenne *Leader* comments upon the heavy tide of immigration that is setting towards a certain mining district in Colorado reputed to be rich in silver-bearing lead ores. In that immigration, stimulated into undue proportions by the most unwarrantable means, the *Leader* sees the portent of terrible disappointment, destitution and suffering; the town of Leadville, the central point of this attraction, being already overrun with multitudes of half famished, diseased and nearly desperate people. Being at a great elevation this locality, which remains deeply buried under the snow, is greatly liable to pneumonia and other diseases of the respiratory organs, from the effects of which hundreds have already died or are now suffering with little prospect of recovery. This journal charges that these unfortunate people have been induced to rush off to that inhospitable region in the dead of winter through the exaggerated accounts published about its mineral wealth by the agents of transportation companies and others interested in promoting a movement of this kind. If now a paper issued on the very highway to this fatal locality and likely to be benefited by such immigration, feels constrained to speak thus deprecatingly thereof, we may feel assured it has good reasons for entering its protest against both the movement itself and its active promoters. This action is significant of danger and ought to be accepted as a warning signal by those who, under the excitement caused by these extravagant accounts, may have it in contemplation to visit this deadly and greatly overrated locality.

We would call the attention of parties engaged in quicksilver mining, or other pursuits of like nature, to the advertisement, in another column, of the patent Life Saving Respirator.

Mining Summary.

The following is mostly condensed from journals published in the Interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Phœnix.—Plymouth Cor. *Ledger*, Mar. 29: The Phœnix company have been obliged to delay the working of the mine on account of the scarcity of timbers. It is expected that the mine will resume work in a few days. The timbers are jammed in the stream, and a large force of men are now at work to extricate them. The mill is running on rock accumulated on the dump. There is enough to last two or three days. A great many timbers are needed in the workings of this mine. The ground is heavy, and the ore body large, and the vast space caused by the excavation of ore has to be substantially timbered. The tunnel running south from the north shaft is making good progress. It has advanced between 400 and 500 ft, and is intended to strike the vast ore body of the south shaft at the depth of 1,200 ft.

Mining Notes.—There is a hitch in the claim south of the Phœnix. Work has been suspended for the present. The Phœnix company made application for a patent, but are barred by a prior claim, which must be purchased before their title can be passed upon by the United States. Thomas Bowden, amalgamator at the Phœnix, says that the new quartz claim owned by their company will pay $100 per ton. The claim is located on the east side of Indian creek, one mile north of Plymouth, on Jackson Gregg's land, and is said to be on the Phœnix lode.

Volcano Items.—The Confidence quartz claim has been started up. Four men are at work sinking, and the erection of hoisting works is talked of. A Santa Cruz company are going to sink a shaft for gravel half a mile east of the Confidence, on the same ridge. The great tunnel is in over 1,200 ft. It has only just got to work again after the robbery of the powder and burning of the magazine. A custom quartz mill is a desideratum in Volcano district. Stewart's mill is kept constantly running on Down's rock, with no prospect of being able to do anything for other parties. A 10-stamp mill for custom purposes would pay well, besides aiding materially in the development of the mineral resources of the district.

CALAVERAS.

Banner Mine.—*Chronicle*, Mar. 29: Active operations at the Banner mine, Mosquito, have had to be temporarily suspended in consequence of the disability of the boiler that runs the hoisting works. The boiler was in such condition that the water could not be kept from the mine, necessitating a suspension that will be but short. A crushing of rock from the Banner mine, 57 tons, has lately been made in Garland's mill. The yield was not quite up to the average.

Jottings.—Operations have been resumed at the well-known Anderson Flat mine, West Point district, under the supervision of Desmond, agent of a San Francisco company. The pumps were started up this week, and as soon as the shaft is freed of water, stoping will be commenced. Extremely rich rock is being obtained from the Charlotte mine, at Mosquito, Messrs. Peck & Potter proprietors. The ledge is a very promising one, but not yet sufficiently developed to determine its permanence and value.

EL DORADO.

Pilot Hill.—Placerville *Democrat*, Mar. 29: Quite a strike has been made in the Victoria mine, Hogg's Diggings. The ledge is seven ft thick and the ore from the recently-opened pay chute prospects at the rate of $75 per ton by mill process. The claims of Stephenson and Mendez afford prospects scarcely less flattering than the above. The Bowlder gravel mine is run night and day, under the superintendence of Prof. Wheeler. No doubts are entertained but that a big clean-up will be the result of this winter's work. Adjoining the Bowlder claim ex-Justice M. L. Warner is vigorously at work on his gravel bank.

INYO.

This Modock.—*Independent*, Mar. 29: By far the most important mining work now going on in Inyo county is the deep tunnel enterprise of the Modock Con., at Lookout. It will develop our most prominent base metal mine at the greatest depth yet attained, the level being 1,000 ft below the ledge croppings and 100 ft deeper than the new Union shaft at Cerro Oordo. The face of the tuunel is now in beyond the vertical line of the old bodies of lead ore, but the strong pitch into the hill of the accompanying silver belts—the Confidence ledges—renders it difficult to judge how much further the tunnel must be driven to intersect the ledge. It must, however, be in close proximity to it now, and a strike is almost daily expected.

Snow's Canyon.—The mill is in operation on custom ore, and a new impulse thereby given to working and prospecting the numerous small, rich gold ledges of the district.

New Coso.—There is a much better feeling in and about the old mines of Darwin since the New Coso furnace, by its great reduction of charges for smelting and liberal and prompt payment for ores on delivery, has practically carried out a plan whereby all the mines contribute ore to keep one furnace in constaut work. The Custer mine is in line on this matter, the old Defiance and others will soon fall in, while the Lucky Jim itself looks extremely promising for a good output of ore and bullion during the season.

MONO.

This Defiance.—*Standard*, Mar. 29: The shaft is slightly inclined, following the ledge, which dips to the east. The depth reached is 143 ft, from which point a drift extends north 168 ft. At the bottom of the shaft the lode is 18 ft in width; at a point 72 ft north in the drift it narrows to eight ft, while at the extreme face of drift north it again widens, and is 11 ft wide. The west, or foot wall, is as smooth and well defined as a ceiling; the eastern side of the fissure is somewhat broken. The filling between is largely composed of good looking quartz; but it is also subject to those whitish clay slips characteristic of the Silver Hill formation, so far as present depths have determined. There is an unusual amount of the black manganese coloring scattered throughout. In places the vein matter prospects high, while the average assay of the solid quartz is indicative of a good "milling proposition." The company have decided to put on steam hoisting works at once and follow the lode. The shaft will be enlarged to double its present size. The prospect would appear to justify a new vertical shaft, but the incline has been decided upon. A new ledge has been discovered a few feet west of the main one, surface prospects from which are very encouraging; gold being readily borned from the very croppings. This lode is almost three ft in width, and its discovery a result of accident.

The Standard.—The Burgess or Cook ledge has been developed north of the crosscut about 100 ft. At this point the ledge dipped sharply west, theu for a distance of 30 to 40 ft twisted out of the line of drift and was lost sight of entirely. In this short distance it seems to have turned a complete somersault, landing on its feet right side up and richer than ever, but pitching to the eastward at an angle greater than it had inclined in the other direction. The ore of this irregular vein is at present a "sight for sore eyes." Its rich ore is as full of the precious metal as the best of the Bruce, which ledge, by the way, is holding its own northward over 300 ft from the Bodie line. The Oildea is the prettiest ledge in the whole series; in fact, there is none in the whole district so clean cut as to walls and filling of bright, live quartz.

NEVADA.

Round Mountain Mine.—*Herald*, Mar. 29: The main tunnel is in 400 ft. It is large and commodious, being six ft in the clear, and is substantially timbered. They were obliged to run in a distance of 300 ft before the gravel was reached. There are two drifts brauching off from the main tunnel, and each of these is in a distance of about 200 ft. The gravel is very rich. There were a vast number of little particles of gold varying in size from that of a pin-head down to specks too small for the naked eye. There are about a dozen men at work in and about the mine, and they are taking out about 80 carloads per day. The gravel is easily mined, and as it is run out of the tunnel in cars, it is not very expensive getting it out. There are over a thousand carloads on the dump now, which will soon be washed.

Blue Tent Mines.—The mines have been kept constantly running since water was first gotten through the ditches. It has required good management to keep the water running all the time, owing to the many little slides which have occurred, but it has been done. The snow-sheds constructed over the ditches in the heavy snow belt have been an immense saving from breaks, as the snow coming down the mountain sides strikes the top of the shed and shoots over instead of hitting the flume or ditch, as it would otherwise do. These sheds will be extended as soon as convenient, so as to cover all places exposed to snow slides.

Moore's Flat Items.—The Blue Banks claim are about ready to begin washing. The Boston mine is running full blast. There are at present about 30 men employed in the mine, and more are engaged. They are paying $3 per day. The Miners' Union succeeded in convincing the managers of that mine that it would be better to continue the rate of wages at $3 per day than to attempt to enforce the proposed reduction. There will be a blast of 200 kegs of powder exploded under the bank of the Boston claim in a few days. The claims owned by the Chinese are running in full headway.

SAN LUIS OBISPO.

Placer Mines.—*South Coast*, Mar. 26: About 150 miners, principally Spanish people, are engaged in taking out gold, the average pay is probably $1 per diem. The mines are what are known as gulch diggings. The mines developed and now working are located in and on a number of dry guiches, all within a radius of perhaps two miles. The want of water is the great impediment in the way of more successful mining. Mr. Jackson and Thomas Fuller have located and proceeded to prospect in a systematic manner a piece of ground in the same gold belt, but four miles away from the principal mines, on a large stream which has a fine running stream of water.

SHASTA.

Igo Items.—Cor. Reading *Independent*, Mar. 27: Mr. R. Harvey has tried the strength of several tons of powder in the Hard Scrabble mines, loosening thousands of tons of gravel; the giants have since been throwing water with great force on this loosened mass, night and day, with good effect, while in other parts of the extensive mine blasting is going on, driving the bedrock cuts up to other high banks, to give work for other giants. Dunham & Co. have commenced a ditch, taking the water out of Cottonwood near Mr. Taylor's, below Eagle creek, running it down to the mouth of Hulan creek, where there is good diggings. There is a large force now working on the ditch, and it will soon be completed. Messrs. Prevost & Co. are still driving their tunnel ahead on one of Mr. Engle's mines, with good prospects, as also are Messrs. Wilson & Co. Work in the mines of the South Fork district is going ahead as well as it can, considering the weather. Wright & Co.'s arastra has been delayed by the rain, but with one day more of good weather, it will be completed; they have already commenced hauling quartz; and are in good spirits.

Big Thing.—A rich ledge has been discovered near Slick Rock, about three and a half miles from the Conway location, which from all accounts beats anything yet discovered. The ledge is owned by William Murray, E. G. Parker, Fred. Ten Eyck and Mr. Vaudeveer. Mr. Murray says that he has drawn a line over the ledge to a distance of 1,000 ft, and that it will average three ft in width, the rock in some places assaying as high as $1,000 to the ton. It is composed of rotten quartz that is completely speckled with gold.

TUOLUMNE.

In Operation.—*Independent*, Mar. 29: The new 10-stamp mill of the Gold Hunter Consolidated mining company started up March 21st. The claim of this company is six miles east of Summerville, on Big canyon, and 16 miles east of Sonora. Their vein is on the same range of slate on which is situated the Ferguson mine and the celebrated Hight mine, in Mariposa county. The mine has been six years in process of development. The shaft is now down nearly 200 ft, and shows good rock in the bottom, the vein running from 18 inches to four ft. Some of the rock prospects big, having an abundance of free water, and the rock being easy of extraction, they can get out and mill the ore at a very low figure. Three hundred tons of rock are now on the dump, the levels are all run for stoping, and ore enough is in sight ready to break down to keep the mill employed a year. The mill was built by D. Seeber, and contains all the modern improvements. The battery is driven by a 30-ft iron wheel. The machinery has run right along like a clock without change or stoppage.

Mining Items.—At the Keltz mine, above Columbia, the shaft is now going down in good rock—more than paying the expense of sinking. The shaft is now down 100 ft, and after getting 80 ft deeper a second level will be run. The mill is doing good work on rock from the first level. The bottom of the shaft shows a vein three ft wide. Wm. Sharwood, T. C. Birney and M. Moyle are the owners of the mine. The Omega tunnel is being re-opened and run into Table mountain from the Jamestown side, by John Oliver and the Daley Bros. Murry & Kyser have struck rich quartz on the Black Hawk hill, near Brazee's saw mill road at the head of Bald mountain. Geo. Morgan, Columbia, has "struck it big" on the old St. Louis claim, between Spring gulch and Rose gulch, near the Shangbai claim.

NEVADA.

WASHOE DISTRICT.

Dardanelles.—Gold Hill *News*, Apr. 3: Active operations have been resumed at this mine. The new shaft, which is 100 ft deep, is being sunk as expeditiously as possible. The situation of the new shaft has been well chosen. There is ample dumping ground for years to come; the railroad track runs within 100 ft, facilitating the delivery of wood and timber, and it is closer to the ledge than the old works.

Con. Virginia.—The repairs to the shaft have not yet been completed. The main drift to the C. & C. shaft on the 1500 level is still receiving attention in the line of enlargement and re-timbering, as also is the joint drift on the 1650 to the shaft. The joint west drift, 2150 level, continues in favorable-looking vein material, carrying stringers of quartz, through which it is making three ft per day. It is now in 326 ft. The C. & C. shaft is 185 ft below the 2150 level.

Utah.—The V-bob has been delivered and is being set up on the surface, and the braces, etc., adjusted. The drilling for the anchor bolts is finished. The main incline is down to-day 363 ft on the slope, below the 1350 level.

Alta.—The three-compartment incline, joint with the Benton, is down and timbered 210 ft on the slope, below the 1550 level. It follows the pitch of the ledge.

Julia Con.—The pumps above the 1600 level have all been disconnected except two, the upper clacks of which have been taken out, causing them to answer the purpose of balance bobs. All the water pumped is now discharged into the Sutro Tunnel, and the 2000 level will soon be reached.

California.—The joint Consolidated winze from the 1950 level is down 105 ft. Both are in hard blasting rock. The joint west drift, 2150 level, is in 326 ft, and penetrating a fine vein formation, carrying stringers of quartz. The C. & C. shaft is being sunk at the rate of two ft per day, and is 185 ft below the 2150 level. The flow of water continues unabated.

Sierra Nevada.—Sinking in the incline has been resumed. The water is increasing slightly, but the flow is readily handled. The drift on the 2200 level is being graded and timbered very rapidly. The ventilation of the mine is excellent, a strong current of fresh air coming in from the main shaft and through the connection with the Utah.

North Bonanza and Flowery.—The boilers are in place. The joint shaft is making three ft per day, and is 66 ft below the second station. The north lateral drift from the first station being rapidly pushed along the ledge, shows a regular wall of clay several feet in thickness.

Justice.—The surface workings in the Waller Defeat grounds are still yielding their usual amount of ore. The donkey engine greatly facilitates operations and lessens the cost of extracting the ore. The yield is 35 tons per day.

Gould & Curry.—The joint east drift, 1700 level, is making six ft per day through good working ground, its face 712 ft from the lateral drift. The Curry winze from the 1700 to the 1900 level is being retimbered. In the Osbiston shaft a bob-pit is being cut out. The drain tunnel is making very rapid progress toward the shaft, the ground being soft and favorable.

Union Con.—The 1450 drift north, connecting with the Sierra Nevada, is still being repaired. The joint Mexican incline winze from the 1600 level is down 320 ft, and is being met by an upraise from the 2000 level.

North Con. Virginia.—A set of timbers per day is being put in as the shaft follows down the upraise from the 1700 level of the Sierra Nevada. Ventilation in the shaft is continually improving. The superintendency of the mine has been placed under the care of Wm. H. Patton, the well-known bonanza superintendent.

Mexican.—The joint Union incline winze from the 1600 level is now down 320 ft, on the slope, in favorable looking vein porphyry. The joint Ophir upraise from the 2100 level is penetrating hard blasting porphyry, its face 61 ft above the drift.

Best & Belcher.—The east drift, 1700 level, is nearing the perpendicular of the Osbiston shaft at the rate of six ft per day. Crosscut No. 1, 1900 level, is making about equal progress through good vein material carrying stringers of quartz. At the Osbiston shaft a bob-pit is being excavated.

Bullion.—The face continues in soft vein porphyry with streaks of quartz. The pipe for the new compressor has been laid to the 2150 level and the foundation completed.

Trojan.—The northeast drift from the third station is making three and one-half ft per day, through a promising vein formation consisting of quartz and porphyry. From the incline upraise above the second level, a drift is being run south through fine-looking quartz.

Yellow Jacket.—The new shaft is being sunk in very hard, dry ground. The drift on the 2400 level, and from the north winze, is approaching the shaft at the rate of six ft per day. The new air compressor is working well.

Overman.—The O & C shaft is down 550 ft. A pocket of water has been encountered which has stopped the work till the flow subsides somewhat. Some 60,000 gallons are raised per day.

Leviathan.—Work is being actively prosecuted in the lateral drifts both north and south on the 750 level, each making good advancement. The machinery and new cables are operating finely.

Exchequer.—The delay caused by the breaking of the pumping machinery of the Imperial has prevented the usual progress in the north drift, 2400 level, but the work has been resumed, the face of the drift being still in a fine formation of vein matter.

Mt. Hood & Vancouver.—The guides are not all yet in the shaft. The work has been delayed by repairs to the shaft, which had to be retimbered for a distance of 60 ft at the 600 level.

Caledonia.—The east drift, 1600 level, has been discontinued. The winze below this level is still in a mixture of clay, porphyry, and quartz, carrying considerable water. The O & C shaft is down 550 ft.

Hale & Noacross.—Timbering and securing the lightning drift. The pumps hold the water below the 2000 level while this work is being done.

Savage.—Pumping and holding the water below the 2000 level and retimbering the incline. Forty ft of this work have been completed.

Con. Imperial.—Work is now going on as usual and the drift is following the vein and intersecting some fine-looking feeders. The south drift, same level, is being pushed as rapidly as possible to connect with the 2400 level of the Yellow Jacket for needed ventilation.

Sutro Tunnel.—All the surveys have been made for the contemplated sub-drain and the grade is established. The preliminary work necessary to the commencement of operations has been completed, and the advent of Mr. Sutro is awaited to begin digging the drain.

Ophir.—The main incline is down 155 ft, on the slope, below the 2200 level, penetrating vein porphyry, carrying streaks of quartz. The joint Mexican upraise from the 2100 level is up 61 ft, and passing through hard, blasting porphyry.

Andes.—The main drift north on the 350 level is penetrating quartz of a favorable character. A crossdrift from a point 25 ft from the face has been started west, and is encountering small streaks of quartz.

Ward.—The work of bailing the water from the shaft is still going on, some 40 ft still remaining before the bottom, 1,400 ft, is reached. The water pipes have been laid from the tank to within 40 ft of the building. A roof has been put over the tank and it has been lined on the outside and a door put in.

Belcher.—The main incline is now 21 ft below the 2600 level, and guides have been extended to the bottom. On the 2300 level, near the south line, a crosscut has been started, which is now opening up a fine vein formation.

Silver Hill.—The east crosscut on the 1100 level is still showing up low-grade ore, and has its face 520 ft from the incline. A drift has been started south from the Justice workings in the Waller Defeat ground.

EUREKA DISTRICT.

Williamsburg.—*Mining Report*, Mar. 29: The main shaft has been sunk to a depth of 100 ft and a drift started on the vein; the latter being in about 50 ft. A winze has been sunk 40 ft on the ore body, and at the bottom the ledge is over five ft wide and assays about $300 per ton. The formation is a white clay with brown streaks running through it. Bunches of ore have been struck in other parts of the mine which assayed over $1,000 per ton silver. In another place a shaft was recently started, now down 10 ft, in which a well-defined ledge was struck. More work has been done than was really necessary, the mine not having been opened up in the proper shape, but if the main shaft be driven down to the depth of 200 ft, a level opened and a drift started for the ledge, it could be worked to a better advantage.

Kit Carson.—A contract, on which work was commenced a few days since, has been let to sink the shaft 100 ft further down. The large cavity mentioned some time since was followed down for a distance of 60 ft, when hard ground was struck. This formation lasted for a few feet and another cave was found. The immense amount of foul air which arose from this cave to the upper one, compelled the miners to quit work for a while as they were all getting sick. The object of the contract above mentioned is to sink the shaft to a sufficient depth to drift from the bottom and run under this cave, thereby furnishing a current of fresh air. The drift will be about 50 ft long. The first cave is 160 ft deep and almost perpendicular and the last one, as near as can be judged, is about 80 ft. There is crystal formation between the two. Considerable galena ore was found in the large cave.

REESE RIVER DISTRICT.

The Manhattan.—*Reveille*, Mar. 29: The 517 stope shows no falling off in either grade or size of ledge. The 517 west drift is being driven into the ore body as fast as possible. There is no change in the 560 stope, the ledge continuing small but rich. In sinking a winze from the 600 east drift a considerable body of very fine ore has been developed, which will soon be ready to be worked through the 675 level. The 825 stope contains a very large ledge, but the ore is not as high a grade as formerly, though still over $200 per ton. The winze in the 600 west drift of the North Star shaft is now down 40 ft. It will be continued down to a depth of 50 ft, when a drift will be run to prospect the ledge.

Western Nye.—Orantsville *Sun*, Mar. 26: Everything about the Alexander mine is looking well. The yield of ore continues unchanged. The north crosscut from the

[Continued on page 220.]

The Genesis of Cinnabar Deposits.—No. 1,

[A paper read before the Geological Section of the California Academy of Sciences, by S. B. Christy, Ph. B.]

There is no branch of theoretic geology which has greater interest both to the student and to the miner than the study of the nature and origin of mineral veins. It is the province of the geologist to make a careful study of the phenomena as they exist in nature, while on the other hand, it is that of the chemist to take up the study at this point, and, given the facts, to find an explanation for them.

The whole subject is one of the most difficult that chemistry and geology have undertaken, and even with the aid of all the appliances which modern science brings to bear upon its problems there is still much to be accomplished. Even to the general reader the names of Hall and Phillips of England; Daubree, Durocher, St. Clair Deville and De Senarmont of France; Rose, Bischoff, Pfaff and Fuchs of Germany; Hunt, LeConte, Dana and others of America, are too well known and appreciated to need any eulogy. But as only the special student is familiar with the progress which has been made in this direction, it may not be out of place to recapitulate briefly, what has been accomplished.

Fuchs in his interesting and valuable monograph *Die kuenstlich dargestellten Mineralien* has carefully compiled what has been done by the chemists and geologists already mentioned, as well as by many others. This record shows that nearly all the important native metals, their oxides, hydrates, carbonates, sulphates, sulpharsenates, sulphantimonates, sulphates and many of the silicates have been successfully reproduced. Among this list may be mentioned as examples, galena, argentite, realger, iron-pyrites, copper pyrites, mispickel, molybdenite, fahlore, fluor spar, quartz, corundum, opal, calc spar, aragonite, dolomite, witherite, strontianite, malachite, etc. These artificial minerals it is true were many of them almost microscopic in size, but they were proved to have the same physical properties, crystalline form, hardness, color, specific gravity, etc., as the native minerals, as well as the same chemical composition.

The methods by which they were produced have in common the condition of freedom of motion among the molecules which favors crystallization, but otherwise they vary widely. The following is a condensation of the list as given by Fuchs *(Die kuenstlich dargestellten Mineralien, p. 6.):*

1. Molecular rearrangement.
2. Sublimation.
3. Decomposition of vapors at a high temperatures.
4. Action of gases and vapors upon strongly heated solid bodies.
5. Melting.
6. Solution in liquids.
7. Slow union of dilute solutions.
8. Electrolysis.
9. Diffusion of solutions.
10. Union of substances which slowly act upon each other.

Of these ten methods, with perhaps the exception of No. 9, all have been observed in nature.

While it has been proved that some of these minerals may be produced by more than one method, as iron pyrites, quartz and cinnabar, others as the carbonates have been as yet produced in only one, it follows that the conditions which occur in any particular locality must be very carefully studied before we can decide in the matter. The results of the more recent observations and experiments, tend to show with increasing certainty the importance as a transforming agent of the solution of the alkalins carbonates and sulphides, especially when these act under the conditions of great heat and pressure. A constantly increasing number of phenomena are being explained by their influences, and the importance which was formerly attached to the sublimation theories is gradually decreasing.

The ores of mercury, however, partly from the fact that they have been but little studied, and partly from their easy volatility, together with the difficulty of accounting for their solution in any known reagents which are supposable in nature, has led to their being generally regarded as formed by sublimation. Even in so recent a work as that of M. H. Kuss, (*Memoire sur les Mines et Usines d'Almaden*, p. 47, reprint from *Annales des Mines,*) the author says: "We should always recognize in cinnabar the character of a vein substance carried to the surface very probably in the state of vapor."

The purpose of the present paper, is then, a discussion of the two theories as to the formation of cinnabar deposits. We shall endeavor to find an answer to the question, "Are cinnabar deposits produced by sublimation, or are they deposited from solution?"

In considering this question it will be necessary to review, briefly, the facts to be explained and the present state of knowledge with regard to the chemistry of certain of the compounds of mercury. The subject will therefore be divided as follows:

First—The facts to be explained. A brief synopsis of the nature of some of the more important cinnabar deposits.

Second—Some of the more important properties of cinnabar.

Third—The results of some original investigations on this subject.

Fourth, and lastly—A comparison of the relative probabilities of the two theories.

First—The Characteristics of Some of the Principal Cinnabar Deposits.

I begin with the one with which I am personally acquainted, that of New Almaden. This has already been well described by Prof. Silliman in the *American Journal of Science*, but a statement of its principal points may not be out of place. This mine is situated about 13 miles southwest of San Jose, in a low range of hills. This range begins at the Hacienda creek and runs parallel to the Coast range for about four miles, when it is cut by the Guadalupe creek. These hills, so far as exploited, are composed of serpentine overlaid by a layer of magnesian schists, which are nearly always black, and which on analysis I have found to contain much iron and some alumina. Overlying these are other schists which become more and more aluminous until generally they change into clay slates. These latter rocks are everywhere greatly metamorphosed, in some cases so much so that they approach in appearance the darker varieties of jasper. These overlying schists have the same general dip as the surface of the hills, modified, of course, more or less, by subsequent erosion.

The serpentine gave as the result of qualitative analysis large amounts of magnesia and silica, with smaller amounts of iron and alumina, and traces of chromium, manganese, calcium and nickel.

Lying between these magnesian schists (to which the Mexican miners have given the name "alta," and the Cornishmen "banging wall") and the serpentine beneath is found the deposit of cinnabar. The "vein matter" itself appears to be a serpentine somewhat altered by infiltrated waters. It is sometimes extremely tough as well as hard, and is difficult to mine; at other times it is very soft and fragile. A qualitative analysis of a specimen of the former variety, selected by mining Capt. Gray as the hardest rock in the mine, proved it to be essentially hydrated silicate of magnesia, with small amounts of iron, chromium, manganese, calcium and nickel.

Associated with the cinnabar are found dolomitic crystals of pearl spar, iron pyrites, chlorite, and, extremely seldom, crystals of quartz. Another notable fact is the occurrence of a bituminous substance resembling idrialite. This substance is wrongly stated by M. Kuss in the memoir above cited to be a "veritable coal." It is not a true coal. It sometimes has the appearance of a soft bituminous coal, but when heated melts and flows like bitumen. Ordinarily it is found in the liquid condition, and flows from the drusal cavities in which it is contained when they are opened. When strongly heated it gives off highly inflammable hydrocarbon vapors, and leaves an intumescent coke, which is very light and fragile and burns with scarcely any ash. Sometimes the schists spoken of are impregnated with a hydrocarbon more like petroleum, as in the 1500-ft and 1600-ft levels of the Randolph shaft.

In the part of the mine near the Cora Blanca shaft is a sheet of dolomitic limestone which runs from the top to the bottom of the mine. This lies immediately beneath the alta in most cases, although some ore has been found above it. It varies in thickness from one to two feet. In analyzing this, among the matters insoluble in hydrochloric acid there were found some microscopic crystals of iron pyrites. In the various workings there seem to be layers of sandstone, particularly in the Cora Blanca, They seem always to overlie the vein matter, though in the latter mine they are impregnated with cinnabar. The exact position and significance of these latter rocks I have been as yet unable to determine. It is probable, however, that these sandstones are more or less local in their origin, being the result of slightly varying physical conditions which existed during their deposition.

Native mercury occurs rarely, chiefly in the sandstone of the Cora Blanca (also on the 1500 and 1600-ft levels of the Randol shaft, where it ran out of the shattered alta upon opening out the vein matter where it was very much broken up by faulting.)

In many cases the micro crystals of cinnabar are most intimately mixed with those of dolomite, and occasionally with those of quartz. The cinnabar is nearly always so thoroughly impregnated with bitumen as to leave a carbonaceous residue on distillation.

Throughout this interesting mine there are many evidences that chemical and mechanical action has taken place. A strongly alkaline spring with free carbonic acid (the New Almaden Vichy spring) is still active at the Hacienda. Occasionally springs with sulphydric as well as carbonic acid are opened by the drifts. In the mine itself "slickensides" (surfaces polished as smooth as glass by slipping on each other) are frequently meet with, and often large masses of serpentine are broken off bodily and are buried in the superincumbent mass of alta.

The ore is very irregularly distributed throughout the vein matter, frequently disappears altogether, and reappears in such an uncertain way, that despite the well established course of the ore body or "vein" itself, there is a great deal of skill required to properly exploit the mine.

The Guadalupe and the now abandoned Enriquita mines appear to belong to the same formation, but it would require a thorough examination of all of this series of mines to trace out this and other interesting questions.

I have dwelt thus long upon some of the geological characteristics of this mine, because it is, in many respects, typical.*

Von Cotta, in his *Erz Lager Staette*, Vol. II., p. 616, gives the following as the characteristics of the principal cinnabar mines of Rhenish Bavaria, Bohemia, Alps, upper Italy and Spain.

Country Rocks—Sandstone, clay schists, trachyts, talcose mica slate, limestone and quartzose mica slate.

Ore Matter—Cinnabar, blende, galena, fahlore, limonite, amalgam, copper pyrites, iron pyrites, silver ores, native quicksilver, horn quicksilver, idrialite, lehererz, magnetic iron pyrites.

Vein Filling—Quartz, hornstone, heavy spar, calc spar, dolomite, spathic iron, gypsum.†

Such a general distribution of carbonates certainly argues against the sublimation hypothesis. With a few exceptions, these cinnabar formations are not in immediate relation to igneous rocks, but rather to metamorphic rocks: In some cases (seven out of sixteen), the deposits are described as veins, the others as in clefts (*klufte*), layers, or impregnations. Usually, with the notable exception of Almaden in Spain, cinnabar does not seem to form in true fissure veins, but rather to be interspersed in the ore body in a very irregular manner, as is indicated by the term impregnation.

Second—The Chemical Properties of Some of the Salts of Mercury.

The inquiry here becomes limited within very narrow boundaries. The soluble salts of mercury, which could exist in any natural mineral waters, are very few. The mercuric chloride is, at first sight, the most probable one, the sulphate not existing in solution except in the presence of a free acid. Still, salts of mercury have been proved to exist in at least one mineral water. In the analysis of the water of the spring "du Rocher" (*St. Nectaire-le-haut, Puy-de-Dome*, by M. Garrigon, *Comptes Rendus*, XXXIV., p. 936), there is given as a constituent of the water, a small amount of mercury. It was very small; the total amount of all the heavy metals, including mercury, estimated together was only 0.008 grammes per liter. But the author states that he obtained enough mercury from 500 liters to exhibit it in the metallic state.

It seems much more probable, however, that the salt of mercury usually regarded as the most insoluble is the one in which we are directly interested, *i. e.*, the mercuric sulphide. This salt, as is well known to all chemists, while insoluble in almost everything else, in both of its modifications, the black, or amorphous, and the red, or crystalline, is soluble in solutions of the alkaline sulphides, containing free alkali. This fact is recognized both by Rose and Fresenius, but I have been unable to find any exact statements as to its solubility. Prof. V. Stein, in *Dingler's Polytechnisches Journal* (*Bd.* 138, *S.* 390,) states: "I find that sulphydrate of sodium, as well as potassium, dissolves cinnabar, even in the cold, with the same ease as water dissolves sugar." This statement is, to say the least, a great exaggeration. He also states that the polysulphides of the alkalis failed to dissolve any noticeable trace of the sulphide of mercury. The most careful work upon the subject is, perhaps, that of Dr. R. Weber, *Poggendorf's Annalen der Physik und Chemie* (*Bd.* 97, *S.* 76). He finds that sulphide of potash dissolves the sulphide of mercury only in the presence of free potash or soda. He states that the addition of carbonic acid, sulphydric acid, or flowers of sulphur precipitates the mercury from such a solution completely. On the other hand, it is well known that solutions of the alkalins polysulphides slowly change amorphous mercuric sulphide to the crystalline variety. This would hardly be the case unless partial solution had taken place. It is also a well-known fact that the mercuric sulphide, when it is suddenly precipitated from alkaline sulphide solutions, either by excessive dilution or saturation with carbonic or other acids, is not in the form of crystalline cinnabar, but in that of the black amorphous variety. And, finally, we have the well-known fact that the amorphous sulphide volatilizes (out of contact with the air, below a red heat, 500° C., unchanged,) and is deposited as crystals of cinnabar in cooling. On the other hand, if the vapor is rapidly cooled, the deposit is the amorphous black variety.

Such, in brief, is the not altogether satisfactory state of knowledge upon this subject.

*For a description of the principal cinnabar deposits of California, see *Les Gisements de Mercure de Californie*, par M. G. Rolland, *Annales des Mines*, 1873.

†For a full description of the deposit of Almaden in Spain, see the article of M. Kuss above cited, p. 10–49, or the translation by the writer, p. 6, etc.

[Concluded Next Week.]

A new use for sawdust is reported in the *Polytechnic Review*. It says that a French authority recommends the use of sawdust instead of hair in the mortar to prevent its peeling off. His own house, exposed to prolong storms on the sea coast, had patches of mortar to be renewed every spring, and after trying without effect a number of substitutes, he found sawdust perfectly satisfactory. It was thoroughly dried and sifted through an ordinary grain sieve to remove the larger particles. The mortar was made by mixing one part cement, two lime, two sawdust, and five sharp sand, the sawdust being first well mixed dry with the cement and sand.

"A half-ounce letter taken to the sun," says Proctor, "would weigh four and a half tons, if the attraction of gravitation remained the same as on the earth in proportion to the mass."

The Engineer.

Marine-Engine Economy.

One of the most suggestive illustrations that can be adduced as showing the advances made within the last 40 years in marine-engine economy is derivable from an examination of data of recorded averages of Atlantic steamships; and more especially of those of the Cunard paddle-wheel steamer *Brittannia*, in 1840, and the White Star screw-steamer *Brittannic* in 1877. Of the first vessel the average duration of passage was 14 days and 8 hours, and the consumption of fuel, 544 tons, the daily consumption thus being 38 tons. Assuming the average cargo at 225 tons, this gives 48.35 cwt. of coal per ton of cargo; and the averags speed in knots per hour being 8.3, the consumption per knot was 3.8 cwt. The indicated horse-power was 740, and this consumption per horse-power, 4.7 cwt. The *Brittannia* displaced but 2,050 tons, and this must be taken into account in comparing her with the *Brittannic*, whose displacement is more than four times as great, or 8,500 tons. That vessel, in 1877, showed an average passage of 7 days, 10 hours and 53 minutes, an average daily consumption of fuel of 100 tons, or total consumption of 745 tons. Her cargo is 3,350 tons; consumption of fuel per ton of cargo, 4.45 cwt; average speed, 15.6 knots; consumption per knot, 5.3 cwt.; indicated horse-power, 4,920; consumption per horse-power, 1.9 cwt. In other words, we are now enabled to transport 15 times as much freight across the ocean in one-half the time at an expenditure of less than one and a half times as much coal as in 1840.—*The Engineer.*

The Telegraph and Railroad in Japan.—The government of Japan seems to be particularly distinguishing itself in the extension of its telegraph system. There are now no less than 125 telegraph stations and 5,000 miles of wire in operation; 1,000 miles more in course of construction, and still further extensions are contemplated. The telegraph insulators made in a village called Imari in the province of Hizen are of such an excellent quality that orders for them have been sent from Europe. It is the first aim of the government to provide good highways in all parts of the empire before entering upon any general system of railroad building; but on the 26th of July, 1876, a line of railroad 48 miles in length was completed between Hiogo and Kioto, and now a line has been commenced between the latter place and Ostu, and is expected to be completed in three years at a cost of about $1,000,000. The railroad between Hiogo and Kioto is constructed of the best imported material and passes through ons of the richest and most beautiful agricultural districts in Japan. Seven trains leave and arrive at Hiogo daily, and the passenger and freight traffic are constantly increasing. The iron bridges of this road, one of which is 1,300 feet in length, are a credit to the government and contractors.

Resistance of Ships Due to Their Depth—Information Wanted.—Every ship is probably accompanied by waves whose natural speed depends on the vertical depth to which she disturbs the water; and consequently where the speed of the ship exceeds that natural speed, there is probably an additional term of resistance depending on such excess. In a paper before the British Association, Prof. Rankine gives some observations that prove the existence of waves whose speed of advance depends on the depth to which the vessel disturbs the water. The relation between those waves and the resistance, remains a subject for future investigation; but to facilitate that investigation, he calls for farther observations, such as the measurement of the angles of divergence of the wave ridges raised by various vessels at different speeds, and the determination of the figures of those ridges—also the mean depth of immersion as found by dividing the volume of displacement by the area of the plane of flotation, and that not only for the whole ship, but for her fore and after bodies separately.

A very useful invention has been devised by a Mr. J. N. Holmes. It consists of a bomb which can be fired at a distance of miles from the coast or from a ship, and it is so contrived that it will float upon the surface of the water and emit a very powerful light for about an hour. By its use in war the approach of a hostile fleet during the night might be disclosed, and in time of peace it could be employed with advantage in rescuing crews of vessels stranded in the darkness, or in occasionally warning ships approaching too near a dangerous and low-lying coast.—*Nevada State Journal.*

One-Idea Men.—An exchange remarks that they are seldom healthy, wealthy or wise—nature loves variety; to which another answers: No one is able to do all things. Concentration of thought and effort in one direction are necessary to distinguished success. Watt was not a jack at all trades if he did invent the steam engine.

Engineers of steamships have found that the best lubricants are glycerine for the cylinders, and castor oil for the bearings. When castor oil is used, the main hearings are seldom heated. Only the best glycerine can be employed with advantage, but when it is of a high grade the results leave little to be desired.

MODELS FOR TENEMENT HOUSES.—The Plumber and Sanitary Engineer of New York, conjointly with four other gentlemen, some time ago offered a premium of $500 for the four best models of a tenement house, to be erected on a lot 25x100 feet, enclosed by buildings at the sides and in the rear, the walls to be of brick and the floors of timber. One hundred and eighty designs had been received at the Leavitt Art rooms. A prime object is to secure a proper distribution of light and air for poor occupants, at such rates of rental as shall be moderate, and yet secure a profit on the investments. These designs come from the architects of 30 cities. The time for a decision between the competitors has not yet been announced.

AMERICAN BRIDGE BUILDING.—In a late address upon the public works of the United States, M. Malezieux, of Paris, complimented the American engineers upon their skill in building bridges of large span, and says that all other nations may borrow many useful hints from them in regard to the use of compressed air in laying foundations.

ON an English railway recently, on the occasion of a trial of the Westinghouse brake, a stop was made in a distance of 511 feet, with the train (passenger) going at a speed of 60 miles an hour. This remarkable feat was accomplished by the use of a special brake valve which kept the pressure on the wheels just below the sliding point.

FORM OF PROJECTILE FOR PENETRATING WATER.—Careful experiments have clearly proven that flat-ended projectiles penetrated both water and armor, at an angle, better than the hemispherical or the gothic end.

Standard Measures.

The standard yard, now in use in the United States, was taken from the English standard yard; but it was subsequently shown that this standard, as deposited in the office of weights and measures at Washington, was incorrectly taken off—it being 0.00005803 longer than the English imperial standard yard. This difference was no doubt due to incorrectness of the divisions on the original scale, or derived from insufficiently delicate appliances for reading off the measure from the English standard.

It cannot be expected that the divisions on the English scale could be very correct, from want of knowledge in those days to make a correct screw, which is yet a difficult problem, even with our advanced knowledge of mechanic arts. But as it was originally intended to have the English and American standards of length alike, we ought not to acknowledge any difference.

The Smithsonian Institution published tables in 1859, comparing the length of the English and American foot measures, which makes the American yard 2·1000th parts of an inch longer than the Imperial standard yard, or a difference of four inches *per mile*. The United States Coast Survey are now using a corrected American standard yard, the same length as the Imperial standard yard.

A STRANGE PEOPLE.—Dr. Siegfried read an interesting paper at a late meeting of the Philadelphia Academy of Natural Sciences, giving some account of an almost unknown and very strange people residing on the island of Botel Tobago, situated in the seas to the southward of the Indian ocean. This paper was founded on the report of a party of U. S. Naval officers, which recently visited those islands. The party was surveying a rock east of the South Cape of Formosa, and called at this island. They found a curious race of Malay stock. These aborigines did not know what money was good for. Nor did they ever use tobacco or rum. They gave the officers goats and pigs for tin pots and brass buttons, and hung around the vessel all day in their canoes waiting for a chance to dive for something which might be thrown overboard. They wore clouts only, ate taro and yams, and had axes, spears and knives made of common iron. Their canoes were made without nails, and were ornamented with geometrical lines. They wore the beards of goats and small shells as ornaments.

HOW TO SUCCEED AS A MECHANIC.—Every mechanic should study to be progressive. He should study to make every new piece of work a little better, in some way, than the last similar work which he has turned out. An eminent French coachmaker says: "I never build two carriages exactly alike, not because I do not build each one as well as I know how, but in building that I learn how to make the next one better. When I placed these carriages of mine in the exposition building, I thought them perfect, but now that I have spent three months looking over the carriages of other builders, I see that they are not so." Here is an illustration of the value of close observation and study.

A NEW DEVICE FOR CLEANING SHIPS' BOTTOMS.—Experiments have been made in England with the Archimedean revolving brushes for cleaning the bottoms of iron ships. It is self-acting, being worked by a revolving screw, the revolutions of which are regulated by the speed of the vessel. The brushes are made right and left, so as to strike the vessel with the current, and cleaning away all grass and slime without injuring the paint. It is the opinion of nautical men that during a voyage, were the machine to be used at intervals, the bottom of the vessel would be kept perfectly clean, and much time would be saved on the ship's passage.

USEFUL INFORMATION.

The Mysteries of a Lump of Coal.

For years no one supposed that a lump of soft coal, dug from its mine or bed in the earth, possessed any other purpose than that of fuel. It was next found that it would afford a gas which was combustible. Chemical analysis proved it to be made of hydrogen. In process of time mechanical and chemical ingenuity devised a mode of manufacturing this gas, and applying it to the lighting of buildings and cities on a large scale. In doing this, other products of distillation were developed, until step by step, the following ingredients are extracted from it:

1. An excellent oil to supply lighthouses, equal to the best sperm oil, at lower cost.
2. Benzole—a light sort of ethereal fluid, which evaporates easily, and, combined with vapor or moist air, is used for the purpose of portable gas lamps, so-called.
3. Naptha—a heavy fluid, useful to dissolve gutta-percha, India rubber, etc.
4. An excellent oil for lubricating purposes.
5. Asphaltum, which is a black, solid substance, used in making varnishes, covering roofs, and covering over vaults.
6. Paraffine—a white crystalline substance, resembling white wax, which can be made into beautiful wax candles; it melts at a temperature of 110°, and affords an excellent light. All these substances are now made from soft coal.

NEW MODE OF MANUFACTURING WHITE LEAD. A German paper gives a new process of making white lead, which is described as follows: The molten lead is poured through an iron sieve into a tank filled with water. Hereby it is converted into threads of one-sixth of an inch in thickness, which are now placed in vats, each of which holds about 1,000 threads. Vinegar is now poured over the lead, and immediately drawn off again. Under the influence of the air and the vinegar adhering to the metal, the latter is oxidized. The vinegar is now poured into the vat and again drawn off, when it carries away the acetate formed on the surface of the metal in solution. After this process has been repeated a number of times, the vinegar has been transformed into a concentrated solution of basic acetate of lead, from which the carbonate may be prepared by the introduction of a current of heated carbonic acid gas. The supernatant liquid is—mixed with another quantity of vinegar—used again for the same process.

BRONZING WOOD, LEATHER, PAPER, ETC.—The *Moniteur Industriel*, of Paris, describes a process for bronzing wood, leather, paper, etc., as follows: The inventor dissolves gum lac in four parts by volume of pure alcohol, and then adds bronze or any other metal powder in the proportion of one part to three parts of the solution. The surface to be covered must be very smooth. In the case of wood, one or several coats of Meudon or Spanish white are given, and the object is polished with an iron of proper shape. The mixture is painted on, and when a sufficient number of coats have been given, the object is well rubbed. A special advantage of this process is that the coating obtained is not dull, but can be burnished. A transparent varnish is applied to preserve the metallic appearance thus obtained.

HOW TO MAKE COURT-PLASTER.—Soak isinglass in a little warm water for 74 hours, then evaporate nearly all the water by gentle heat, dissolve the residue in a little proof spirits of wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now stretch a piece of silk or sarsanet on a wooden frame, and fix it tight with tacks or packthread. Melt the jelly, and apply it to the silk thinly and evenly, with a badger hair brush. A second coating must be applied when the first has dried. When both are dry, apply over the whole surface two or three coatings of balsam of Peru. Plaster thus made is said to be very pliable and never breaks.

COSTLINESS OF FOOD.—Thousands of persons, we might say hundreds of thousands, in our great republic, begin life poor, live poor during life, and die poor because of the exceeding costliness of the foods they eat. Think of our eating butter at 35 cents a pound, when one can buy Indian corn at 60 cents a bushel. One bushel of hickory nuts has more oil in it than five pounds of butter. One bushel of Indian corn has more nutriment in it than $2 worth of the best beefsteak you can find. One bushel of real graham flour has more nutriment in it than a barrel of superfine flour and 50 pounds of beefsteak. We spend ever so much to live when it need cost us but little, and our health will be all the better.—*Exchange.*

A HAND coal-cutting machine has been introduced into some of the Pennsylvania coal mines, which, it is said, will cut seven yards face, to the depth of three feet, and making a cut only four inches wide, in one hour. It weighs 240 pounds. Can be used for heading, breast or shear. Requires no track; easily handled by one man, and does the work of ten. The reduced amount of slack as against pick is enough to commend it to every bituminous coal operator. It can be seen in operation at the Morris Run mines, where five machines are now at work.

SAFE AND CONVENIENT METHOD OF TESTING DYNAMITE.—The *Chemiker Zeitung* contains a description of a method of testing dynamite. The percentage of nitro-glycerine is determined by extracting it with ether, which dissolves it, but leaves the infusorial earth unchanged. The difference in weight of the dynamite and of the infusorial residue, directly yields the percentage of nitro-glycerine. In order to ascertain whether the dynamite contains any other bodies soluble in ether, the ether extract is diluted with water, which precipitates any foreign substances present.

HOW GASLIGHT IS LOST.—Computations of the loss of light by shades of different kinds have been brought together by Prof. Chandler, and are presented in a pamphlet entitled "How to Burn Gas." The lowest absorption of ground glass is nearly 30%; there is only one specimen at this low figure, other shades of that kind absorbing more than 62%. Opal glass causes a loss of 53% to 56%; green, purple and ruby glass, 82% to 89%; and a porcelain transparency, over 97½%.

PURITY OF MILK.—It is stated in a German paper that the purity of milk may be tested by the following very simple method: A well-polished knitting-needle is dipped into a deep vessel of milk and immediately withdrawn in an upright position; when, if the sample be pure, some of the fluid will be found to adhere to it, while such is not the case, if water has been added to the milk, even in the smallest proportions.

CEMENT FOR CAST IRON.—Five parts of sulphur, two parts of graphite, and two parts of fine iron filings, are melted together, taking care that the sulphur does not catch fire. The parts, previously warmed, are covered with the cement, reduced to a pasty consistence on a fire, and firmly pressed together. This cement, it is said, is very well adapted to fill out leaks in cast iron vessels.

GOOD HEALTH.

Olive Leaves as a Panacea.

The olive leaf or branch, old as the ark, woven into many of the sweetest tales of Palestine, descending at last the current ages until it becomes at length a sign of victory in the practical conquest of the earth by the agriculturist of California, has certainly glory enough for one plant. But it has other points of promise which our olive growers will be interested to know. We read in the London *Farmer* that the medicinal properties of the olive and its leaves are just now attracting considerable attention in Italy, and numerous notices of the employment of the plant for such purposes both in past and present times are going the rounds of the press. In the rural districts of Spain, it appears, the powdered leaf is very generally employed by medical men in cases of epidemic intermittent fevers. During the wars of Napoleon in that country, the French army surgeons, unable to obtain access to other medicines, made use of concoctions and extracts of olive leaves, in fevers and several other diseases, with encouraging success. The febrifuge properties of the leaf were proved by M. Faure, at the Strasburg School of Medicine, in 1814, and subsequently by M. Beguin, the military surgeon. In the Provence, astringent gargles, prepared from the leaves, are much used in relaxed and sore throats and similar complaints. The Arabs still pin their faith on a prescription given to them by the prophet, the observance of which is guaranteed to cure almost every disease. A hundred leaves of the olive are to be wrapped in a piece of cloth and applied to the forehead, and the fever or other disease will at once be subdued.

We should be slow to give the leaves the full force attached to them by the Arabs, but a little experimenting in the line followed in Spain and Provence would not be amiss.

A Warning to Plumbers and their Patrons.

Diphtheria, scarlet fever and pneumonia have been particularly active in certain parts of New York and Brooklyn during the past year, and the cause is criminal carelessness, official stupidity, and extraordinary recklessness on the part of property owners, and of builders and plumbers. Although the life of a person in ordinary circumstances is of as much value as the life of a millionaire, it is quite natural that the latter, dying in a costly mansion where money has been lavished on devices for protection and comfort, should attract the greater attention, especially if it were a reasonable inference that sewer-gas was in any degree a predisposing cause. Fortunately the death of the late Mr. Rockwell, in Brooklyn, was brought to notice of the authorities, and the result of an official investigation is most surprising.

When Mr. Rockwell's family began to die, and one after the other was carried to Greenwood, public attention was attracted to the several possible causes of this extraordinary fatality, but no one dreamed that the death-trap was the trap in the millionaire's costly but worse than useless plumbing.

The Sanitary Superintendent of Brooklyn examined the pipes and general plumbing, assisted by an expert. Among other things they found that some of the main lines of soil-pipe that are continued to the roof do double duty—carrying off the sewer-gas and acting as rain leaders. One of the pipes receives the water from 1,200 square feet, and during heavy rains is so filled with water as to empty every trap connected with it. The water closet in the bath room was found attached to this pipe, and its trap was so nearly emptied of water that it offered an obstruction to the entrance of sewer gas. Mr. Rockwell had wash basins in his sleeping rooms and nursery, but the traps do not hold water, so of course the gas had no difficulty in gaining entrance. In fact, if the builder had desired to turn his house into a hospital and furnish his own patients, he could not have devised a better system of defective plumbing.

A Theory in Regard Food.

The *Pall Mall Gazette* says: "A German physician has started a new theory with regard to food. He maintains that both the vegetarians and meat-eaters are on the wrong track. Vegetables are not more wholesome than meat, or meat than vegetables, and nothing is gained consuming a compound of both. Whatever nutritive qualities they may possess, he says are destroyed in great measure, and often entirely by the process of cooking. All food should be eaten raw. If this practice were adopted, there would be little or no illness among human beings. They would live their apportioned time and simply fade away, like animals in a wild state, from old age. Let those afflicted with gout, rheumatism and indigestion, try for a time the effect of a simple uncooked diet, such as oysters and fruit for instance, and they will find all medicines unnecessary, and each a rapid improvement of their health, that they will forswear all cooked articles of food at once and forever. Intemperance would also, it is urged, no longer be the curse of civilized communities. The yearning for drink is caused by the unnatural abstraction from what are termed 'eolids' of the aqueous element they contain—uncooked beef, for example, containing from 70% to 80%, and some vegetables even a larger proportion of water. There would be less thirst, and consequently less desire to drink, if our food were consumed in its natural state, without first being subjected to the action of fire. Clothing, our adviser also thinks, is a mistake, but he admits that the world is not yet far enough advanced in civilization to go about undressed. Whatever differences of opinion may exist as to this anti-cooking theory, there cannot be a doubt that in getting rid of the kitchen with all its abuses, including the cook, housekeepere would be spared a vast amount of worry, and probably on this account alone would live to a greater age than at present."

HOW A SEDENTARY LIFE AFFECTS WOMEN.—The *Popular Science Monthly* remarks that many of the ills and diseases prevalent among women in our days are no doubt traceable to the sedentary mode of life so common among them. The progress of industrial art has done away with much of the household drudgery to which women were formerly subjected, and the result is in too many cases want of sufficient occupation for needed bodily exercise. It says: The fruits of this state of things are strikingly exhibited in certain observations made by the late Dr. Robertson, a Manchester surgeon, who, in his practice as a specialist for women's diseases, found that in women who themselves perform all their household work there was no trace of certain complaints, that these complaints begin to make their appearance in women with one servant, become more pronounced in women who have two servants, or worse still in those who have three servants, and so on. He showed statistically that the deaths from child-birth were four times greater in the cases of women with four servants than those with none. On the other hand we observed a statement the other day that since the suspension of labor in the mills of New England on account of the panic, many of the female operatives have sought employment as domestics, and as a consequence there is much more sickness among them than there was previously. This would seem to show that housework is not as healthy as labor in cotton or woolen mills.—*Troy Times.*

ARE FAT PEOPLE HEALTHY.—Why are fat people always complaining? asks some one who entertains the popular though erroneous notion that health is synonymous with fat. Fat people complain because they are diseased. Obesity is an abnormal condition of the system, in which the saccharine and oleaginous elements of the food are assimilated to the partial exclusion of the muscle-forming and brain-producing elements. In proof of this, it is only necessary to assert the well-known fact that excessively fat people are never strong, and seldom distinguished for mental powers or activity. Besides they are the easy prey of acute and epidemic diseases, and they are the frequent victims of gout, heart disease and apoplexy.

MILK AS A SOPORIFIC.—According to the *Pharmacist*, it is a frequent practice in the New York Asylum for Inebriates to administer to the patients at bed-time a glass of milk, to produce sleep, and the result is often found satisfactory without the use of medicine. Medicine is there sometimes prescribed in milk. It has been recently stated in medical journals that lactic acid has the effect of promoting sleep by acting as a sedative, and this acid may be produced in the alimentary canal after the ingestion of milk.

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The Week.

Small tidings of important developments in the mining regions or decisive fluctuations in the stock market, have reached us during the past week. Of the latter we remark that it seems thoroughly demoralized. Times may have been duller and prices lower with it, but seldom, if ever, has it been in as thoroughly stagnant a condition as now. The Sutro Tunnel compromise seems to have finally come to a definite settlement, with no likelihood of further trouble concerning its provisions. Mention of it will be found in another column. Testimony is still being taken hy the referee of the Alta-Justice case, concerning the conduct of the latter's officers. In spite of the abundance of water and other cheering prospects, the immediate outlook among the placer interests of some sections, is not a bright one. The injunction granted in the "mining debris" case expires on the 9th, and then all the placer mines on or around Bear river will be obliged to suspend work till the case is finally settled by the Supreme Court; and this discussion, together with certain apparently objectionable clauses in the new constitution, have been the grounds for the late shutting down of the Watt Blue Gravel and other placer claims in Nevada county. These stoppages have thrown a number of men out of employment and given discouragement to further prospecting in that part of the country. It is understood that the Chollar is soon to be divided into two mines, the Chollar and the Potosi, each to be represented by 112,000 shares, or eight of the new to one of the old. In other States the mining interests look extremely favorable, but from all the cry is heard for more capital with which to develop and extend the mines.

The Future of our Manufacturing Industries.

The condition of the English manufacturing classes is at the present time altogether woful; it is even desperate. For a while, these poor people, though unemployed, managed to subsist on the little savings of more prosperous times and the funds of their semi-charitable associations. But these resources are exhausted, and, what is worse, the prospect for any early or even ultimate improvement in their condition seems hopeless. The markets of the world, which England for so many years monopolized, are being closed to the products of her great workshops, her mills and her factories. She has, for some time past, been making more of these commodities than she could sell; they have accumulated on her hands, filling her vast warehouses with unsalable stocks and converting millions of invested money into dead capital. And the idle operatives on her hands too. But they, though dying, are not yet dead. It would be better, perhaps, if they were. But it is a slow process, this of starving men to death. The vitality of the half pauperized is wonderful. It surpasses that of the self-sustaining and even the well-to-do. A merely animalized man is apt to live long; and so they survive their wants, these compact, unwieldy masses, abject and hopeless, wallowing in misery and sodden with filth.

The spectacle of these vast populations reduced to such deplorable straights were enough to almost make one wish that no manufacturing pursuit would ever gain a foothold on American soil. And if these industries could be established only through such debasement and suffering it would indeed be well if the country could be kept wholly free from them. But such is not the case. We shall become a great manufacturing nation without brutalizing our operatives or starving them to death. We enjoy many natural advantages for the successful prosecution of these varied industries which England and most other countries do not. We possess or grow the raw material to a much greater extent than she does or can ever hope to do. In our numerous swift-flowing streams we have a cheap and widely disseminated propulsive power that she is without. Our iron and coal, and our other metals and minerals, as well also as our forests, our sheep lands and cotton fields, like our water-power, are illimitable and widely distributed, making it possible and altogether economical for us to scatter our manufacturing establishments all over the land; thereby avoiding what has proved the greatest curse to the English and entire European system—the concentration of many pursuits and consequently of many people at one point. Under this system our mills and factories will be more or less isolated, and the growing up of great, gloomy, pestilential cities be avoided. A few large manufacturing towns will no doubt come into existence, where, as at Pittsburg and some other points, extensive deposits of iron and coal occur in conjunction. But we will hardly have any such overgrown cities as Leeds, Birmingham or Sheffield on this continent. Instead of these great smoke-begrimmed towns, with their slums and foetid atmosphere, we will have numerous cleanly and well-lighted villages; substituting homesteads with their cottages and gardens for the great tenement houses and squalid quarters so common in those cities of the old world with their vast aggregations of people.

Even here in California we may hope to see great manufactures spring up and flourish at an early day. No country more invites the establishment of a system of diversified industries than this. Our wool product is already large, and we shall soon be growing cotton, and, perhaps, also flax, silk and other textile fibers, at a rate that will lead to the building of mills for spinning and weaving these staples into fabrics on a very extensive scale. In the foothills of the Sierra we have water power ample for driving all the machinery in the New England States. And the rivers and creeks that afford this power are not confined to a narrow space. They extend over a stretch of country more than 500 miles long. These streams, which furnish hundreds of eligible and easily accessible mill sites, traverse what must become the great cotton fields of the future. Short branches over easy grades would connect these mill sites with the railroads that now traverse the State almost from one end to the other along the great interior valleys. Buildings could be cheaply constructed at all these points, the country adjacent being well timbered. Here is also the finest fruit growing region in California, the agricultural and wool growing capacities of the country being at the same time very considerable. There is no more beautiful or healthful country than this in the world, and why, with so many natural advantages, it should not in time become a great manufacturing district it is difficult to conceive.

And these reasons that are appliable to this section of California, apply with more or less force to most parts of the United States. Everywhere the manufacturing can be scattered amongst our other industries, and, thus intermixed, all productive pursuits be made mutually beneficial and supporting. While sanitary conditions would be immeasurably promoted, great social and economical advantage must inevitably grow out of this arrangement. England is obliged to import at great cost the breadstuffs and most other food required to feed her factory operatives from abroad. We raise all this at home, and could, therefore, afford to furnish subsistence to this class of populations at much lower rates. By creating courts of conciliation and arbitrament for settling all questions that arise between employers and workmen, by encouraging to the early adoption of the co-operative principle, and by the studious avoidence of the many abuses that have grown up in older countries, we shall, no doubt, be able to build up and sustain in the United States a great system of manufacturing industries, without this English accompaniment of starving operatives to become, alike a reproach to our civilization and a peril to the republic.

Caution and Encouragement to Eastern Mine Investors.

There is now a great deal of unemployed money in the East. This is especially true of the Middle and New England States. The active employers of capital there have for many years been investing largely in railroad and petroleum stocks and in the prosecution of various commercial enterprises and manufacturing pursuits. Banking, gas and insurance companies, together with a great variety of minor industries, have also absorbed largely of their available means. Although profitable for a time, these various branches of business have come to be overdone. Very few of them can any longer be made even fairly remunerative. Competition and over-production have glutted the markets and reduced profits to a very narrow margin or extinguished them altogether. While such is the state of affairs with the more practical and useful callings, in the purely speculative lines of business the condition is even worse, the bold and wealthy having gained such complete mastery here as to render operations by all others futile or exceedingly dangerous.

In this strait the moneyed men of the East are casting about for new enterprises and other fields in which to embark a portion of their idle capital. They naturally direct their attention towards the great mineral regions of the far West, knowing well that there exist here innumerable good openings for making money. They know that the Pacific States and Territories abound with gold and silver-bearing deposits; that our annual product of the precious metals approximates a hundred million dollars and that great numbers of people have been immensely enriched through mining ventures. But they know another thing—they know that nine-tenths of the money invested in our mines on Eastern account have proved a dead loss to the investors; and knowing this they hesitate about embarking their means in a business that to people abroad has turned out so disastrously.

We say people abroad, because it is useless to deny that non-resident investors in mining properties on this coast have, as a general thing, fared worse than those living on this side. The reasons for this are so natural and obvious as to require no explanation. Parties at a distance buying mines through middlemen, often inexperienced and always interested to deceive the purchaser, are, of course, greatly liable to be imposed upon. Between ignorance and design they are almost sure to be victimized. And, for that matter, those domiciled on this coast, miners themselves included, have, through injudicious investments of labor and money, suffered in the aggregate more loss than all other classes combined, these losses having been due in the main to want of experience or other excusable or unavoidable causes, not a few, also, to foolish experiments, hazardous ventures and willful mismanagement; these latter having been of much more frequent occurrence during the early history of this industry than of late.

Mining for the precious mentals was a business that the American people had to learn throughout, and generally under very unpropitious circumstances. But we have at last mastered it pretty thoroughly, and will hereafter be likely to avoid most of the errors of the past. The present is therefore a good time for those who have hitherto kept aloof to embark in this business. They enter upon it at a time when labor is comparatively cheap and abundant, when person and property are everywhere adequately protected by law, when transportation and travel have been cheapened and expedited through the construction of wagon roads and railways, and when they can enjoy all the advantages growing out of thirty years of energetic experimenting and lavish expenditure made to develop and advance the business.

To such of our Eastern friends then as contemplate engaging in this branch of mining we would say this is a favorable time to start in, provided, of course, they intend to pursue it in a practical, business-like way. If they enter upon it with only speculative aims we don't see why an Eastern railroad or an oil well would not answer this purpose equally ae well as a gold or silver mine. For stock gambling they ought to be able to find something nearer home that would serve their end sufficiently well. But of this they are the best judges, and if inclined to get up something for the Eastern share market it is not for us to seek to dissuade them from looking for it in this quarter. Presuming, however, that these parties desire to engage in actual mining and to carry it on in a legitimate way, we respect, they never could have started in at a better time; and if they will only observe the same caution and economy in the conduct of this that they have always considered necessary in every other kind of business they will not be disappointed in their reasonable expectations.

In making choice of a field for mining operations there are some reasons why California should perhaps be selected in preference to any other part of the coast. In the first place, we have here a greater variety of mines from which to make a selection, our metalliferous resources not being confined, as in most of the other Pacific States and Territories, to vein deposits alone. We have several different kinds of placer diggings that can be worked to great advantage, as well also as silver-bearing lodes and auriferous quartz in the greatest abundance, the latter being worked at the present time with more satisfactory results than any other mines in the country. In California almost our entire mining region is traversed or closely skirted by railroads, rendering it easily accessible both as regards freights and travel. The climate is such that mining operations can be comfortably and successfully prosecuted at all seasons of the year, it being, in fact, every way one of the finest in the world. Labor, machinery and supplies of all kinds are cheap in this State and easily commanded. After much experimenting we are able to reduce our ores at a moderate cost and with considerable closeness, our quartz-crushing machinery and gold-saving appliances having been brought to much perfection. We have, in short, cheapened the business and reduced it to greater certainty than has anywhere else been done, notwithstanding the State of Nevada has of late years turned out a larger annual product of bullion than California.

Without enlarging on this point, it is enough to say that California presents as many and as good opportunities for the investment of money in mining as any other section of the coast. From San Diego to Siskiyou, a distance of more than 700 miles, there is scarcely a county along the main gold belt but contains quartz mines of real value, and which could be bought for a nominal sum and he worked with profit. In all the more central and northern of these counties occur the various forms of placer deposits alluded to, and in which interests can also be obtained on terms that no one wishing to engage in this branch of mining could reasonably object to. This region opens an immense field for steady, quiet, profitable mining, nearly all the conditions here being exceedingly favorable.

The people of the East often express surprise that, of all the mines opened and equipped here, so few should, through their large and profitable bullion production, become noted abroad. It should be remembered, however, that there are in California some eight or ten thousand men who make good wages working their own claims in a quiet and limited way, but of which nothing is ever heard. Then there are numerous small associations and incorporated companies who make much larger earnings, though operating in a way equally quiet and unheard of. It is not the policy of these parties to make a noise about what they are doing. Generally speaking, it is only those who have some object to be gained thereby, who seek to give publicity to their operations. Very little do outsiders know about some of the most successful mines in this State. Some of these properties are owned by one or two individuals, or, perhaps, by a small number of partners who have not thought it worth while to incorporate; or who, if they have done so, have never procured their shares to be listed on the stock boards, a proceeding that is apt to prove detrimental to the best of properties by creating two sets of antagonistic interests, one concerned to enhance and the other to depreciate the value of their shares.

A person not conversant with the laws and usages that govern in the mining districts, might be lead to ask why it is that the owners of these valuable claims are willing to sell them at such very low rates instead of retaining and working them themselves? The answer is that under the general laws and local rules regulating these matters, it is possible for a man to establish and maintain possessory ownership to a great number of these mining claims or locations, even though he be without the means to open and put them in shape for active production. All that is required to keep good his title, is the performance of a certain and not large amount of work each year. This done, and he can hold on to them year after year, or till such time as he can make sale of them or find some one who will furnish means for developing and outfitting them for a part interest therein. Sometimes the owner of a productive claim will sell it at a moderate figure to get money to open and rig up another claim belonging to him. Occasionally good bargains may be got because the owner, through sickness or advancing years, or for some similar reason, may wish to leave the mines. Through these several causes there is never a lack of properties to be had on favorable terms, either in California or elsewhere in the mining regions. Let but the Eastern purchaser proceed with his usual caution, buying only after thorough examination and seeing to it that the business is conducted in an honest and capable manner, and he will have abundant reason to be satisfied with his investment in the mines of this coast, whether he embarks his money in the gold-bearing deposits of California, the silver-bearing lodes of Utah or the mixed mines of our other Pacific Coast possessions.

The Snake River Placers.

From a conversation recently had with Mr. J. A. Jacobs, an owner in several productive claims on Snake river and from the letters of correspondente there, we are in posseesion of much fresh and reliahle information touching the condition and prospects of placer mining along that stream. The gold-hearing depnsits extend for a distance of two hnndred miles or more along the Suake, that is to say from the vicinity of the Malad river to Blackfoot and abovo. As a general thing the farther down stream the richer the ground appears to be in gold. This is contrary to the opimione first entertained, and seeme to argue that the gold has heen contrihnted hy the country along the river and nnt brought down from its upper tributaries, along which the hars aleo pay moderately well but not like thoee farther down.

While there is probably a little gold in the surface earth ovor a hroad belt of country lying adjacent to the river, there is enough only in tho bars along the stream to pay for washing. These bars are of two kinds, first those which occur in the deep canyone, and eecondly thoee formed along the flat country through which the river passes. The former, though the more prolific in gold, are comparatively emall, lie low, extendiug down into the water when the rivor falls to its lower etages, and being overflowed when it ie swollen by the melting of the snow on the mountains, which occurs in the monthe of May and June. Theee hars constituted the sites of former operatione, the gold here having heen more plentiful and perhape a little coarser than elsewhere, thereby enahling the pioneer miners to make fair wages washing at first with the rocker and afterwarde with ordiuary sluices. The hars in tho flat country where the river epreads out are generally large, some of them covering hundrede of acree, their eurfaces being from 50 to 200 feet ahove the stream. It ie on theee that the principal operations are being carried on, though the others are also heing worked on a smaller scale.

These larger hars do not, as a general thing, yield gold throughout. Indeed, this is not the case with any of the extremely high onea. Usually there occurs on top a pay etratum from 25 to 30 feet thick compoeed of loose dirt, eome of it much mixed with alkali. Below thie, two or three feet of harren cemented gravel ie met with, not so hard, however, hut that it can he run off with water. Then comes in a hed of clean gravel from 15 to 20 feet thick, and richer than that on top, thie heing underlaid hy a heavy hody of reddish sand, harren and extending, it ie suppoeed, to the hedrock. Not even in all of the higher hare do these eeveral etrata occur, nor yet alwaye in the ahove order.

Already everything along the river that promises to he of any value and a great deal that does not has heen taken up. In proceeding with this husinees the miners after their usual custom have organized districts, elected recordere, and adopted for each a eet of rules to he oheerved in locating and holding claims, which latter are limited to an area of twenty acres each. The washing is done with sluicee, which vary from one to four feet in width according to the quantity of dirt to he put through and the amount of water to he had for washing. The eize of the eluice is, however, apt to depend more upon the amount of the miner's means than other conditione, the quantity of the eilver-coated copper platee, an expeneive item, heing in proportion to the eize of the sluice. These plates coet in thie city ahout $5 per equare foot. On a four-foot eluice running 100 or 150 inches of water from four to five hundred square feet of these plates are employed, while on a one-foot eluice running from 20 to 30 inchee of water only ahout 35 square feet of platee are ueed. At first large eluices with much water were preferred, but latterly the tendency ie to smaller ones as favoring a closer eaving of the gold. The minere there, through constant experimenting with their machines, are all the while slightly modifying their apparatus or the manner of using it. The latest change to he noted in thie connection ie the euhstitution of entire silver platee for the kind now in uee, and which though more costly it ie thought will prove much more effective.

The most distinguished feature of this branch of mining ie the great economy of labor of which it ie eueceptihle, a single man in moet casee heing eufficient to attend properly to the operations of a eluice, whatever its eize; only two men, on alternate shifte, are therefore required to a machine, washing goiog on day and night. Two companies operatiog near each other could get on with a working force of hut five men, four to attend to the sluicee and one to do the cooking. At cleaning up it might he convenient for the eingle man to have some aseietance, hut at other times it is not required except where the dirt is shoveled into the eluices, ae is practiced on the low-lyiog emaller hare, and eometimes aleo on the larger. Generally, however, the force of the water discharged from hoee or narrow wooden hoxes, is eufficient to carry the gravel into and along the whole length of the sluice, the dirt heing eo looee as to require no etirring up after it is once in tho machine. The expenee of outfitting a claim variee from one to three or four thoueand dollars, thie including building cahin, coet of sluice, tools, hriuging in water, etc. Water is brought on the claims through ditches, taking it from the river or its tributaries where this is practicahle. In other cases it is raiscd hy current wheels and carried through troughs to tho points where required for use.

The gravel along Suake river usually pays from $10 to $25 per day to the haud, some claims doing much hetter and others uot quite so well. Occasionally a clean up is made with the larger sluices that paye at the rate of $20, or $30 and even $50 per day to the man.

"LONE PEAKS," ON THE ROAD FROM EHRENBURG TO PRESCOTT, ARIZONA.

As the original coet of outfitting a claim here is not large and the ground will laet for a long time, variously eetimated at from five to twenty yeare, thie ie likely to prove a very attractive and profitable branch of mining. A large eluice will put through from 300 to 400 toue of dirt per day, and the emaller a proportional amount.

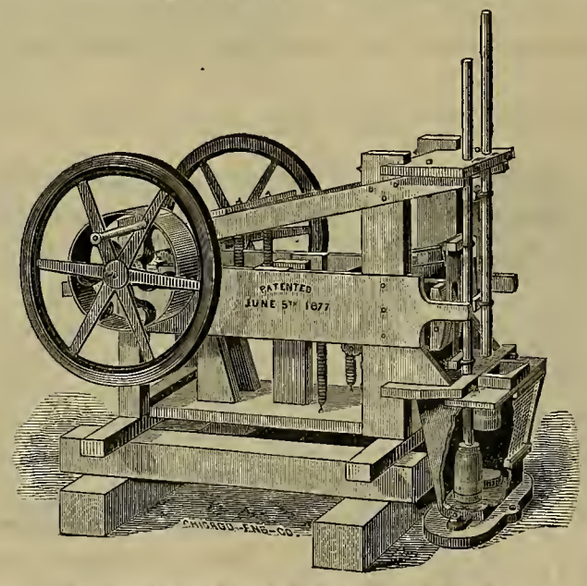
The pricee of claime vary, of couree, with their eize, richneee and the facilitiee at hand for working them, the circumetances of the seller having also very often something to do with the husinees. In some iostaoces claims have heen sold for not more than $50 or $60, while again they will eell for eeveral thousand. Mr. Jacohs telle ue that a tract situate near the Malad and consisting ot eeveral claims with good water privileges, eold lately for $6,000.

From the preceding it will be seen that there is not much use of a man, without eome pecuniary meane, going to these Snake river minee, as everything worth taking up is already claimed and held at pretty stiff prices, while there is hut little demand for labor even at the lowest prices. The wages paid there are $1.50 per day of twelve hours, board inclnded, or $2.50 per day without; monthly wages $42 to $60. Tho coet of living in that region is rather high, for whilo heef and potatoes and eome other things produced there are cheap, all imported articles are dear, owing to the long wagon transportation to which they are subject. The price of passage from San Francieco to these mines will vary from $60 to $80, etage fare from Kelton on the Central Pacific railroad to the river, 135 milce, heing $20.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Standard, March 25th, $17,759; Bulwer, March 25th, $18,284.10; Northern Belle, March 24th, $8,023.37; Alexander, March 28th, $10,-162.08; California, March 29th, $41,132.36; Con. Virginia, March 29th, $28,277.94; Martin White, March 31st, $15,025; Ophir, March 29th, $11,274.14; Grand Prize, March 31et, $8,200; Independence, March 31et, $5,500; Standard, March 21st, $15,502.36; Bulwer, March 31et, $17,777.18.



HAND OR POWER PROSPECTING QUARTZ MILL.

SALMON have commenced to run in Puge sound.

A WORLD'S fair is to he held in New York in 1883.

"Lone Peaks" in Arizona.

We take from "Pictnreeque Arizona," by E. Conklin, another glimpee at the peculiarities of Arizona scenery. In his account of theee wondrous prominences on the level face of the country, the anthnr says:

The eecond night out from Yuma hronght us to "Antelope Peak," a famone camping spot, and so named from a high towering peak jutting up from the ground in magnificent and haughty style, and ehrouding you and the camp grounds eurrounding, with its casting ehadows. An adohe huilding for the stage company's office, and a corral for the protection and care nf the horses, and the graceful flow of the Gila river, o'ershadowed by the towering "Antelope," constitute the main attraction for the camper. It is a very refreshing and cooling retreat for the traveler, whn hae had juet enough of the sand and eun of Arizona hy thie time, to appreciate and enjoy it. Thie peak, inetead of being called a peak, having the features nf eo much of the Arizona mountain ecenery, would be better comprehended hy being termed an ieolatcd mountain; jutting, as it does from the very level of the plains, and throwing iteelf grandly up to a hight of hundrede of feet into nne single conical-ehaped formation. There are several of theee entertaining fellowe over the plaine of the Territory, relieving the eye of mnnotony, and without which the deeerte and the traveler on them wonld yearn for eome eociety. Their extreme contrast with the eurroundinge, exalting them to a glorious standard. One of the moet hold and pleasing of theee peaks ie tn he eeen on Stewart & Peareon'e stage road from Ehrenherg to Preecott. After riding for miles and hours over the hroad eandy plains, with the distant monntaine forming a pleaeing encloeure to a vast natural etage upon which many a weird and midnight ecene has been enacted, to come boldly upon these two lone peake (there are two of them) standing eide hy side, is a scene worth the whole ride. As the stage paeees hy close to their hase, they look down frowningly upon you; and were you euperstitioue, would almoet think they spoke to you in the etarry etillnees of the night.

The occasion which I firet saw these peake wae in the middle of the night. It wae a hright moonlight one, and the hazy light of the moon from hehind, throwing the shadow far over our etage coach, produced a eombre effect. Beholding these two giant figuree o'erepreading me as it seemed, I was held with awe for a few minutes, and then said to the driver, "What are these?" at the same time holding my face up at right angles to eee the top.

"Oh! those?" said he, in a quiet unconcerned voice,—"Oh! those are stonee that grow here in Arizona." I named the peake "Lone Peake," ae agreeahle to the circumstancee and conditione, ae well ae the sentiments of hoth myeelf and my friend the driver.

A Hand Power Quartz Mill.

We give on thie page a representation of C. Eaton'e patent "Poor man'e prospecting hand or power quartz mill." It ie eimple and durahle, and so constructed that two men can operate it all day. The force of the hlow can he changed eo ae to etrike a light or a very heavy hlow, readily. It can be run hy hand or power, a band pulley heing put on as ehown, for the latter purpose.

When power ie ueed the manufacturers inform us that each etamp will etrike 150 hlows per miute; and that the force of the blow in compariecn to the face of the etamp (4½ inchee) ie greater than any of the heavy power stamps. Theee machines are well made, heing put together with holts, to he taken apart readily, so as to he convenient to pack on a mule'e hack. The whole machine weighs ahout 1,300 pounds, the heavieet piece weighing 200 pounde. The engraving eufficiently explains the method of operation.

The revolution of tappete on the crank shaft depreee the inner ende of the levers, which raiee the etampe hy meane of etraps paseing over the outer ende of eaid levers. The other end of the etrap or cord faetened to the etamp ie secured to a ratchet wheel, hy which meane it is poesihle to regulate the drop. Spiral epringe draw down the levere ae they are released hy the came, so ae to cauee the etampe to strike the hlow.

The caeh price of this machine ie $150; for sale at the Ames Steam Engine Depot, 14 South Canal street, Chicago, Ill.

SINCE the Central Pacific Co. put eleeping-care on the road for the accommodation of emigrants the emigration weetward has materially increased, four or five car-loade coming through daily.

THE latest report gives the number of miles of railroad in New York at 5,752, of which 4,358 are douhle track.

THERE are general complaints in the country that the printed Conetitutions are elow in reaching the people.

WORK hae been reeumed in the tunnel where the explocion took place, on the Southern Pacific railroad.

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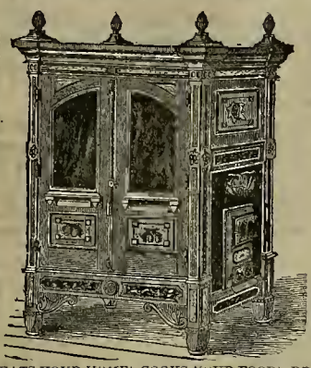

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In WARM WEATHER, when COOKING or DRYING, the HEAT and ODORS can be PASSED UP THE CHIMNEY; and in cold weather the heat can be regulated to any desired degree evenly throughout the house. Food cooked by DEFLECTED HEAT contains more nutriment, is more easily digested, will keep fresh longer, and is much improved in flavor and appearance. Will dry and bleach clothes in half an hour, and heat the irons, thus saving the WASH-WOMAN FROM EXPOSURE while hanging them out in stormy weather or cold rooms.

Fruit dried by DEFLECTED HEAT will gain from 20 to 40 PER CENT. IN WEIGHT, and 30 PER CENT. IN QUALITY over that dried by radiated heat or in the sun.

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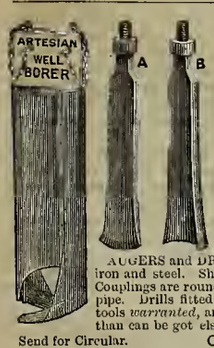

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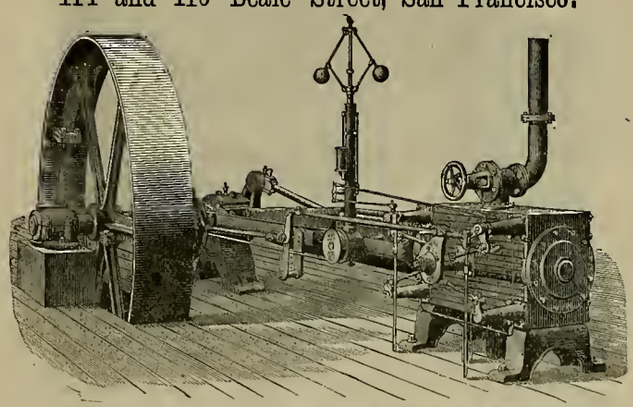

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The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

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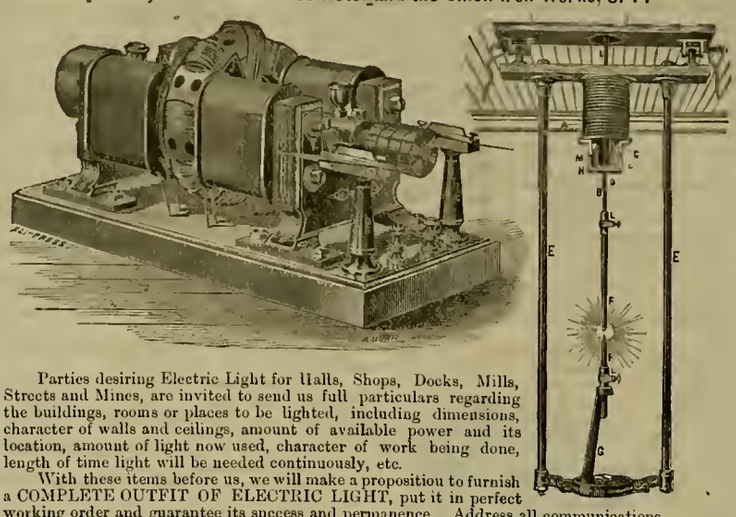

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Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.

MINERS' HORSE-POWER.

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The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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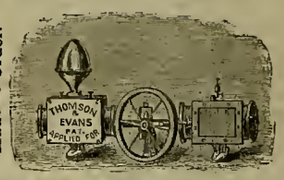

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Coats of Arms, Creste, Monograms and Masonic Inscriptions Carefully Engraved.

[Continued from page 213.]

fourth level is now in 60 ft, ths ore assaying $178 to the ton. In ths second and third levels there is no change in ths quantity of ore. The amount of ore in sight at present is larger than ever before, and the quality is also improving. The south tunnel level is now in 290 ft. The last 50 ft of this level has been run through a solid body of mineral, the face in high-grade ore.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, Mar. 29: The Alice shaft is now down 113 ft, and in four ft six inches of good ore, which samples 192 ounces. The mineral is both widening and growing richer each shot. A crosscut was commenced at 110 ft, and the headcr is now 14 ft from ths footwall, all the way in low grade quartz, with a marked improvement as the hanging wall is approached. Three and one-quarter tons unassorted El Capitan ore, worked at Miami mill 152 ounces. The Golden Eagle mine of Gold Hill, is said to improvs under recent work. There is a shaft 78 ft deep, and in a drift at the bottom there is a five-ft vein that prospects very well in gold, the estimate being about $75 per ton.

TOMBSTONE.—Cor. *Citizen*, Mar. 29: The Lucky Cuss main shaft is down over 50 ft; it was sunk vertically, cutting into the vein at 30 ft from the surface and is still in a fine body of ore. The north shaft is turning out some of ths finest ors that has been exposed for a long tims. At the west cut on the hill can he seen the ore that makes frequent $1,000 buttons. On the Old Guard, the first north extension of ths Lucky Cuss, a 40-ft prospecting shaft is under way, revealing a fine vein of from one to three ft in width. The Contention main shaft is down over 90 ft, and Supt. White expects to make connection with the 113 level from the south shaft in about 10 days.

COLORADO.

LEADVILLE.—Cor. *Tribune*, Mar. 26: The mining fever seems on the increase rather than ths wane. Hundreds of prospectors have gone out this week, and not a few of whom have seen their labors rewarded by discovery of metal in paying quantities. Gold-bearing quartz has been found in California gulch, but whether in paying quantities, or in such amounts as will warrant active working, it is impossible to state. The Bruce iron mine, situated on Stray Horse gulch, has been sold during the past week to parties said to reside in Leadville, for $80,000. The property comprises three or four located mines, among which are the William Penn, Philadelphia, General Cadwalader, and Benjamin Franklin. Nearly all the best paying mines are not doing what they might do, if the prices paid for ore would warrant it. At least twice as much ore could be taken from the mines and good profits realized therefrom, but the companies believe they can hold the ore until better facilities for transportation can be had, and get better interest for their money. The moment railroad transportation reaches Leadville, 50 mines will be worked to a profit where there are five worked now. It is extremely difficult to ascertain, with accuracy, the amount of ore mined in and about this camp per day. There are probably about 15 to 20 mines that average an aggregate of 500 tons of ors per day. Not all of this ore is smelted or even disposed of by the parties taking it out, for the process of smelting, under the present disadvantages of high freights and uncertain transportation, is so costly, that nearly all the profits are eaten up in converting the ore into bullion. There are dumps or places of deposit at all the mines, where nearly all the ors below a certain grade is deposited, to await the time when smelting will be cheaper. It costs nearly if not quite 33½ more to reduce ore to bullion now than it would if the roads were good and freights reduced to its legitimate basis. All this extra cost is, of course, deducted from the purchasing price of the ore. Kokomo continues to attract the excited miner and speculator. Some very good discoveries have been made in the vicinity of Jack mountain, about a quarter of a mile north of the town. Specimens were exhibited here that show rich in silver with some traces of gold. Some of the holes are from 20 to 30 ft, and in many of them there is considerable trouble experienced from water.

MONTANA.

MINING ITEMS.—*Miner*, Mar. 25: During the past winter the main shaft on Mr. Stinson's claim on the Stevens lode was sunk to something over 60 ft deep, or a little below water level. From that point a level was run eastward following the ledge for 50 ft, and another west for 35 ft, when stoping was begun. From the stopes Mr. Stinson is taking ore of three grades, the lowest grade yielding from 60 to 70 ounces per ton; the second about 100 ounces, while a lot of first-class was sold on the dump for $150 per ton. At present the dump contains 250 tons of ore, of which 30 tons is first-class, 100 second, and the balance third-class, or 60-ounce ors. In consequence of the strike in the Alice, the main shaft on the claim will immediately be sunk 250 ft deeper, or to the total depth of 550 ft from the surface. The pumps now in service will be quite equal to the task imposed upon them by the deepening of the shaft; but to cut the ledge at the 500 level will require additional machinery, already ordersd from Salt Lake City. The ore in the 300 level being of so much higher grade, and what is still more important, so much less base, than that of the 200 level, but little doubt is entertained respecting the developments to be made deeper down. Mr. J. K. Pardee, Superintendent of the Algonquin mining company, has purchased the Salmon mine from its former owners, Messrs. Holland & Estell, paying therefore the handsome price of $50,000. Having made this investment, the Algonquin Co. will proceed to the immediate erection of a 20-stamp mill, to be provided with Howell roasting furnaces, and in other respects to ressmble the Allce mill, at Walkerville.

OREGON.

BAKER COUNTY MINES.—*Oregonian*, Mar. 29: Recently a contract has been let to sink a winze 50 ft, commencing at the west drift of the Discovery. Going down a few feet with the winze, a 10-inch vein of very rich ore was found on the foot of the wall, showing much native silver, the ore on the assay showing 65% silver. The contractors are going down slowly owing to ths water flowing in. The winze is now down 20 ft, showing the 10-inch stratum of 65% ore to be increasing in thickness, with every indication of a rich and extensive body of ore in the vicinity of the winze. Another contract is let and being worked on for a drift running east, showing excellent pay rock with every sign of its continuing. The tunnels now run ars too close to the surface to admit of working to the best advantage. What is now required to make the mines yield a large dividend is the necessary machinery for hoisting works, with a vertical or inclined shaft ths depth of 500 or 600 ft, with additional stamps for the mill and a good substantial roasting furnace or two. There are other mines here as rich as the above. The Lafayette gold and silver lode, situated about three-fourths of a mile from the Discovery claim and on the same ledge, has furnished hundreds of tons that have paid as high as $100 a ton in gold. A company of miners are now engaged in extracting very rich ore there, to be crushed at the mill on the Discovery claim, and other rich and extensive mines are lying idle on account of there being no custom mill or roasters in the neighborhood to work the quartz.

THE 2,500 tons of railroad iron for the Northern Pacific are being shipped from New York.

FORTY-EIGHT employees of the Carson Mint were suspended Mar. 31st, till further orders.

THE Russian exploring expedition to the Merv has been stopped.

The Sutro Tunnel.

Final Settlement of Differences Between the Tunnel and Mining Companies.

The final proceedings respecting the agreement between the Sutro Tunnel Company and the Comstock mine owners have at last been taken and the papers signed, sealed and delivered. At Virginia City and Sutro, salutes were fired, and bonfires kindled as tokens of rejoicing over the long-delayed consummation of the agreement. Work on the tunnel sub-drains will be immediately commenced and some 2,000 men set at work. Mr. Sutro expects that the mines will begin to use the tunnel within sixty instead of ninety days, as provided in the agreement. He estimates the daily output of ore, after the mines are drained, or connections with the tunnel made, and crosscutting under way, will average 3,000 tons, of which 2,500 will probahly belong to that class yielding under $40 per ton, on which a royalty of $1 per ton will be paid, and 500 to the class yielding above $40, on which the royalty will be $2. Besides there will he some revenue for transportation, furnishing timber, compressed air, water power, etc.

Although the papers signed by the companies vary somewhat in detail, they are all practically alike, and are to the following effect: The preamble speaking of the original agreement entered into in March, 1866, with the Gould & Curry Silver mining company, declares that all mines on the Comstock lode are heneficially interested in a speedy completion of lateral tunnels, and are desirous of adjusting all their differences. The argument is substantially as follows:

"Article first says that the terms of the agreement have heen complied with hy all parties.

"Article second says that the main tunnel is considered as coustructed according to the terms of the agreement, but provides for the construction of a covered drain to carry off all water, of whatever temperature, within 90 days.

"Article third provides that until the end of 90 days no water shall be discharged into the tunnel; but after that period, or sooner, if a drain is ready, the mines shall be at liberty to dnmp any water into the tunnel, including the water used in the mines for propelling power.

"Article fourth provides for the construction of lateral tunnels—one to the north, running first to about 100 feet west of the C. & C. shaft; thence to about 100 feet of the Sierra Nevada shaft, and thence about 500 feet east of the Utah shaft. To the south, heginning at the Julia shaft, which is already connected with the main tunnel, and running to about 80 feet east of the Yellow Jacket shaft, and thence to about 200 feet west of the new Overman shaft. These lateral tunuels are to he begun within 90 days, to be well constructed, 3 feet wide by 7 feet high, and to he pushed ahead with due diligence.

"Article fifth makes provisions for deflecting from the regular course of the lateral tuunels in case unfavorable ground is encountered.

"Article sixth says that the mining companies agree to advance $70 per foot for lateral tunnels, payments to he made at that rate on the fifth day of each month for work done during the preceding calendar month. Each of the companies has a right to construct a lateral tunnel hefore its own claim and receive credit therefor at the same rate.

"Article seventh provides for the repayment of these advances hy allowing the mining companies to deduct one-half of the monthly charges on ore reduced or sold, until the amount advanced is repaid.

"Article eight provides for the reduction of charges on ore from $2 to $1 per ton on ore yielding $40 per ton, a ton heing 2,000 pounds.

"Article ninth provides that mines lying hetween the California on the north and the Chollar-Potosi on the south shall he considered drained whenever the tunnel is ready to receive water from the mines now connected with it. The mines north of the California or south of the Chollar are to he considered drained as soon as the lateral tunnels reach their respective centers.

"Article tenth provides for the mining companies furnishing a sworn return of their product each month at each mill, with the actual yield in bullion, and for the payment of charges thereon hy the tenth day of the succeeding month.

"Article eleventh provides that no mine shall allow any other mine, which has no agreement, to discharge its water so that it could he pumped into their tunnel.

"Articles twelfth, thirteenth and fourteenth provide for the construction of an outside parallel drain, if it shall at any time become necessary; that all agreements are to he deemed to he of the same purport, and that all articles are to he hindiug upon each party and their successors or assigns forever," etc.

NOT less than $1,000,000 of capital is invested in grounds and buildings of the East Liverpool, Ohio, potteries, and it is estimated that fully 1,200 persons are employed in the various factories, while many more are sustained by this industry in the miuing of clay, etc.

THE Paris exhibition buildings will be entirely demolished, and the Champs de Mars relegated to its old occupation as a drilling ground.

News in Brief.

LOUISIANA bas had seven Constitutions.

BERKELEY is troubled with cattle thieves.

OPIUM smoking is on the increase in Nevada. stand.

TROY DYE, the Tullis murderer, is becoming insane.

THE tramp nuisance is on the increase in Fresno.

MOKELUMNE indulges largely in sturgeon fishing.

LITTLE WOLF'S band of Cheyennes has been captured.

CHINA has made a demand on Russia for territory.

PRAIRIE fires are committing great ravages in Dakota.

GERMANY approves the joint occupation of Roumelia.

FOUR HUNDRED Ohio miners have struck for bigher wages.

POVERTY FLAT is now the richest section on Salmon river.

THERE is a strong call for wives among Western farmers.

THERE is a great deal of partisan excitement at Washington.

CHINESE gambling bouses are being found in New York City.

TRICHINOSIS seems to be becoming common all over the world.

OREGON complains of the prevalence of commercial "drummers."

THERE were 905 English soldiers killed by the Zulus at Isandula.

FOUR Italians have been poisoned with mushrooms at Mendocino.

CALIFORNIA cheese hrings 12½ cents a pound in the Prescott market.

AMERICAN canned goods are to be found in nearly all parts of Asia.

SEVERAL Indian chiefs, including Moses, are en route to Washington.

THE Willamette river, Or., is still rising and a flood is anticipated.

THE woman suffrage hill failed to pass the Massachusetts Legislature.

SUPERIOR coal has heen found at South Boulder canyon, Colorado.

PHOTOGRAPHERS are taking pictures at night hy means of the electric light.

THE arrival of a Chinawoman at New York has created quite a sensation.

THE New Orleans banks have resumed the payment of currency on demand.

OPERATIVE weavers at Blackburn have voted to accept the five per cent. reduction in wages.

A RUSSIAN Countess has heen arrested at St. Petersburg for sympathizing with the Nihilists.

A SEATTLE jury has awarded three cents damages in a slander case. Costs of case, $500.

FROM the light fall of snow a scarcity of water is predicted at Virginia City, this summer.

THE rival medical schools are fighting over the composition of the National Board of Health.

OPIUM smuggling from British Columbia into the United States has become an American industry.

THE New Mexico papers are filled with announcements of discoveries of rich mineral districts in various parts of that Territory.

A GANG of 14 men are engaged in retimbering portions of the Sutro tunnel in places where the ground is soft and unstable.

A NEW BOOK ON THE COMSTOCK LODE.—We have received from John Wiley & Sons, scientific hook publishers of New York city, a circular announcing a forthcoming work entitled the "History of the Comstock Lode," by John A. Church, M. E., professor of mining in the Ohio State University. It is to be in one quarto volume well illustrated by maps and engravings. The author will attempt to show the mode in which the great silver deposits were formed, and will explain the true position of ore hodies in the lode, the relation of rich to harren quartz, the reason for the concentration of ore in particular localities, the channel by which the quartz entered the lode, and the true zonal arrangement of the rich and harren grounds, exhihiting the cause of the long-continued poverty of the portion now worked and the prospect of future improvement. Prof. Church arrives at the conclusion that the mines are by no means exhausted, but that they have a great future before them. The price of the hook will be $6 to those who send in their names before the work is ready for issue; after it appears, the publishers say the price will he advanced. Subscriptions for the hook will be received by Dewey & Co., 202 Sansome street, S. F.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's offics at San Francisco:

ARMSTRONG O. M. Co.—Object: To operate in Butts county. Capital, $500,000. Directors—J. S. Rawlins, C. Stevens, P. Amiraux, J. W. Pew and William Armstrong.

AMEER M. Co.—Object: To mine in Bodie district. Capital, $10,000,000. Directors—Thomas Price, A. J. Ralston, J. P. Allen, D. L. Parkhurst and R. H. Brown.

BOSTON S. M. Co.—Object: To mine in Alpine county. Capital, $10,000,000. Directors—L. O. Cole, H. W. Redington, George E. Maguire, C. F. Moulthorp and James Biddolph.

CENTRAL STAR O. M. Co.—Capital, $2,000,000. Trustees—Robert J. Creighton, Edmund B. Kilhorne, William F. Drake, Charles H. Howland and S. Wilson Church.

MONTE CRISTO CON. M. Co.—Object: To operate in Mono county. Capital, $1,000,000. Directors—J. D. Thompson, J. M. McDonald, Clinton Gurnse, L. Shoris and B. F. Bivins.

CARRIE STEELE M. Co.—Object: To operate in Utah. Capital, $10,000,000. Directors—John F. Miller, Louis A. Garnett, O. H. LaOrange, J. F. Cronise and O. C. Miller.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Diepatch from Washington. D. C.

FOR THE WEEK ENDING MARCH 11TH, 1879.

213,032.—BUFFER SPRING—Wm. M. Betts, S. F.

213,174.—WATER GAUGE AND ALARM—O. Collier, Sacramento, Cal.

213,177.—GUIDE FOR STEMS FOR STAMP MILLS—C. Crane and W. Raup, Park City, Utah.

213,096.—ENGINE—J. H. Darragh, S. F.

213,194.—NOZZLE FOR HARDENING DIES—J. B. Harmstead, S. F.

213,206.—BREAD BOX—W. O. Jones, San Joss, Cal.

213,055.—CAR COUPLING—J. C. McCollum, Wilmington, Cal.

213,154.—IMPROVEMENT IN CONSTRUCTION OF BRIDGES—E. Williams, S. F.

213,153.—CAR BRAKES—A. Weymouth, Livermors, Cal.

213,117.—AXLE FOR VEHICLES—E. E. Lincoln, San Jose.

213,052.—IMPROVEMENT IN LAMPS—D. Lubin, Sacramento, Cal.

213,134.—IMPROVEMENT IN DENTAL PLUGGERS—H. Richmann, S. F.

7,196.—LUBRICATING COMPOUND—Trademark—Dean, Oraccy & Co., Virginia City, Nevada.

——This patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Forsign Patents furnished by DEWEY & Co., in ths shortest time possible (by telgraph or otherwise) at the lowest rates. All patent husiness for Pacific coast inventors transacted with perfect security and in the shortest possible time.

A LAND-SLIDE on the Lehigh Valley railroad tbrew a locomotive of a New York train from the track, killing its engiueer and fireman.

A MORMON mob captured Tooele conuty, Utah, and controlled elections to suit themselves.

THE negro exodus from Louisiana continues.

SOUTH PACIFIC COAST RAILROAD.—This popular line has made a reduction in rates betwsen San Francisco and San Jose and Santa Clara, to take effect April 1st, 1879, viz: Regular local tickets betwcen San Francisco and San Jose, $1.75; Santa Clara, $1.65. Round trip tickets (good until used) between San Francisco and San Jose, $3.25; Santa Clara, $3.05. Excursion tickets sold Saturday afternoons and Sunday mornings from San Francisco and Park street, Alameda, to Santa Clara or San Jose and return, $2.50; good only until Monday evening following date of purchase. Commutation tickets good for one round trip daily during calendar month, between San Francisco and San Jose, $20; Santa Clara, $19. Family tickets for 10 rides and 30 rides, also six months and yearly commutation tickets on sale at corresponding reduction in rates.

ORO. H. WAGGONER, Gon'l Pass. Ageut.
THOS. CARTER, Superintendsnt.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Oruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Lifo Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of Insured, 224 Sansome St., San Francisco.

M. D. SHRADER is now an authorized agent of the PACIFIC RURAL PRESS, also MINING AND SCIENTIFIC PRESS, to solicit subscriptions and receive the money for the same His receipts given for such money will be duly honored by this company.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 416 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco.

METALS.

[WHOLESALE.

WEDNESDAY M., April 2, 1879.

IRON.—	
Amsrican Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 12½
TIN PLATES.	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, April 2, 3 P. M.

SILVER, 1½@2.

GOLD BARS, 890@910. SILVER BARS, 8@20 ₱ cent. discount.

EXCHANGE ON New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 86@88.

LONDON CONSOLS, 96 5-16; Bonds, 103.

QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

LUMBER.

CARGO PRICES OF REDWOOD.

WEDNESDAY M., April 2, 1879.
PUGET SOUND PINE RETAIL PRICE.

Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Laths	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	REDWOOD. RETAIL PRICE.	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., April 2, 1879.

Solo Leather, heavy, lb	22	@	29
Light	20	@	24
Jodot, 8 Kil., doz	48 00	@	50 60
11 to 13 Kil	65 00	@	76 00
14 to 19 Kil	80 00	@	90 00
Second Choice, 11 to 16 Kil	55 00	@	70 00
Cornellian, 12 to 16 Kil	57 00	@	67 00
Females, 12 to 13 Kil	53 00	@	67 00
14 to 16 Kil	71 00	@	76 00
Simon Ulmo, Females, 12 to 13 Kil	58 00	@	62 50
14 to 15 Kil	66 00	@	70 00
16 to 17 Kil	72 00	@	74 00
Simon, 18 Kil	61 00	@	63 00
20 Kil	65 00	@	67 00
24 Kil	72 00	@	74 00
Robert Calf, 7 and 9 Kil	35 00	@	40 00
Kips, French, lb	1 00	@	1 35
Cal. doz	40 00	@	60 00
French Sheep, all colors	8 00	@	15 00
Eastern Calf for Backs, lb	1 00	@	1 25
Sheep Roans for Topping, all colors, doz	9 00	@	13 00
For Linings	5 50	@	10 50
al. Rus set Sheep Linings	1 75	@	4 50
oot L ogs, French Calf, pair	4 00	@	—
BGood French Calf	4 00	@	4 75
Best Jodot Calf	5 00	@	5 25
eather, Harness, lb	35	@	38
LFair Bridle, doz	48 00	@	72 00
Skirting, lb	33	@	37
Welt, doz	30	@	50 00
Buff, ft	18	@	21
Wax Side	17	@	80

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 1, 1879.

HIGHEST AND LOWEST BAROMETER.

Mar 20	Mar 27	Mar 28	Mar 29	Mar 30	Mar 31	Apr 1
30.103	30.278	30.208	30.172	29.934	29.833	30.006
30.101	30.198	30.191	29.958	29.801	29.704	29.870

MAXIMUM AND MINIMUM THERMOMETER.

62.7	61.8	70	77	66	62.5	64
55.2	51	53	55.7	55	53	55.5

MEAN DAILY HUMIDITY.

85	68	64.3	64.3	79	77	74.3

PREVAILING WIND.

W	NE	W	N	W	N	W

WIND—MILES TRAVELED.

229	140	93	130	163	149	172

STATE OF WEATHER.

Fair.	Clear.	Clear.	Clear.	Cloudy	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

.08						

Total rain during the season, from July 1, 1878, 20.15 in.

Mining and Scientific Press Patent Agency.

PATENTS obtained promptly; Caveats filed expeditiously Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and nt Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Griffith Consolidated Mill and Mining

Company.—Location of principal place of business, San Francisco, California. Location of works, Diamond Springs Mining District, El Dorado County, California.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 21st day of January, 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
J H Brewor	30	50	$ 10 00
Warren Bryant	not issued	2100	420 00
Alexander Brysnt	37	1125	225 00
Alexander Bryant	38	1125	225 00
L H Foote	30	100	20 00
L G Harvey, Truetco	35	4000	800 00
J H Roberts	10	500	100 00
J H Roberts	20	500	100 00
J H Roberts	21	500	100 00
J H Roberts	22	500	100 00
J H Roberts	26	500	100 00
J H Roberts	27	500	100 00
J H Roberts	28	500	100 00
J H Roberts	29	500	100 00
J H Roberts	30	500	100 00
J H Roberts	31	500	100 00
J H Roberts	32	500	100 00
J H Roberts	33	500	100 00
J H Roberts	34	500	100 00
J H Roberts	280	200	40 00
J H Roberts	281	200	40 00
J H Roberts	282	200	40 00
J H Roberts	283	200	40 00
J H Roberts	284	200	40 00
John G Vantine	not issued	4500	000 00

And in accordance with law, and an order of the Board of Directors, made on the 21st day of January, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the Company, No. 330 Pine street, Room 48, San Francisco, California, on the 26th day of March, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

O. M. CONDEE, Secretary.

Office, Room 48, No. 330 Pine St., San Francisco, Cal.

POSTPONEMENT.—The above sale has been postponed until Saturday, April 5th, 1879, at the same hour and place. By order of the Board of Trustees.

O. M. CONDEE, Secretary.

Mount Jefferson Milling and Mining Com-

pany.—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors held on the 21st day of March, 1879, an assessment (No. 6) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 318 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 2d day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 27th day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	38	700	35 00
Edwards, J E	39	700	35 00
Gautier, Gustavo	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1870, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1870, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

POSTPONEMENT.—The sale of delinquent stock of the above named Company is hereby postponed until Tuesday, the Sixth day of May, 1870, at the same hour and place. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

The California and Oregon Land Company.

—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

Notice is hereby given, that at a meeting of the Board of Directors, held on the First day of March, A. D., 1879, an assessment (No. 2) of Forty Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, 318 Pine street, Room 6, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of April, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Saturday, the Tenth day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine Street, Room 6, San Francisco, California.

Union Stone Company.—The Regular

Annual meeting of the Union Stone Company of California for an election of a Board of Directors (to act as Trustees) to serve the Company for the ensuing year, and for such other business as may properly come before the meeting, will be held at the office of the Secretary of the Company at 237 First Street, San Francisco, California, on Tuesday, April 8th, 1879, at 11 o'clock A. M.

R. F. KNOX, Secretary.

San Francisco, March 20th, 1879.

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Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.

No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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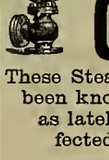

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Governor

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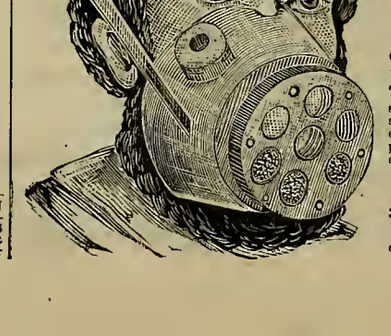
WATSONVILLE, July 20th, 1878,

MESSRS. DEWEY & CO.—*Gents:*—I was not expecting my patent so soon. You certainly kept your word when you said no time would he lost. I remain, yourstruly,

W. T. EASTERDAY.



— PATENT —

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Prevents Lead Poisoning and Salivation.

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Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 202 Sansome St., room 7.

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Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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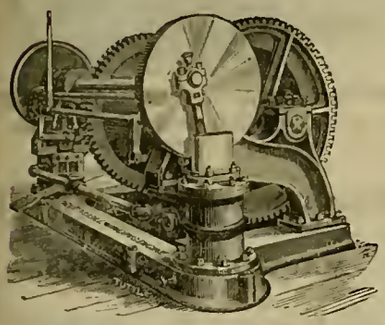

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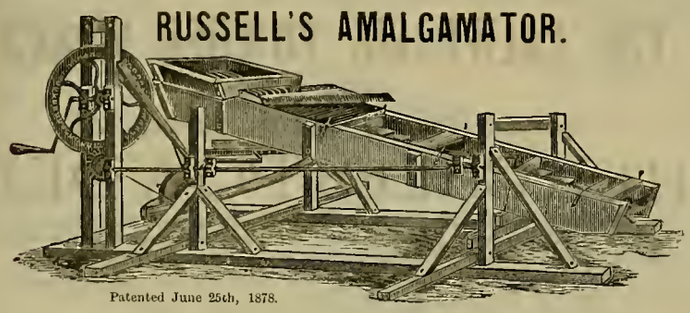

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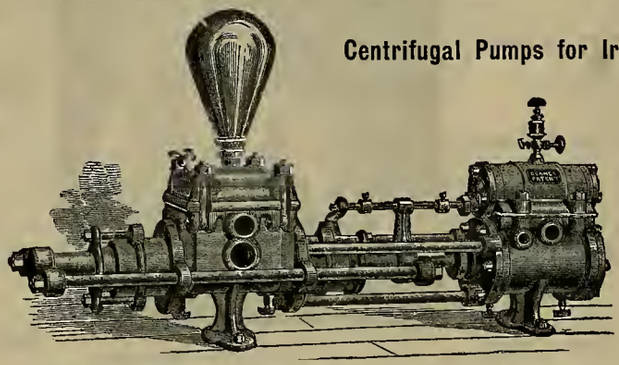

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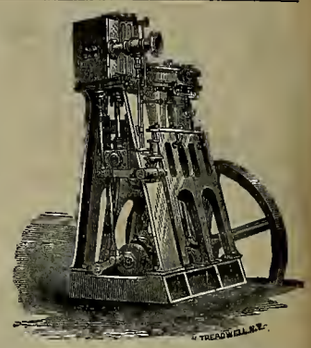

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Lathe Without Saw Attachments.

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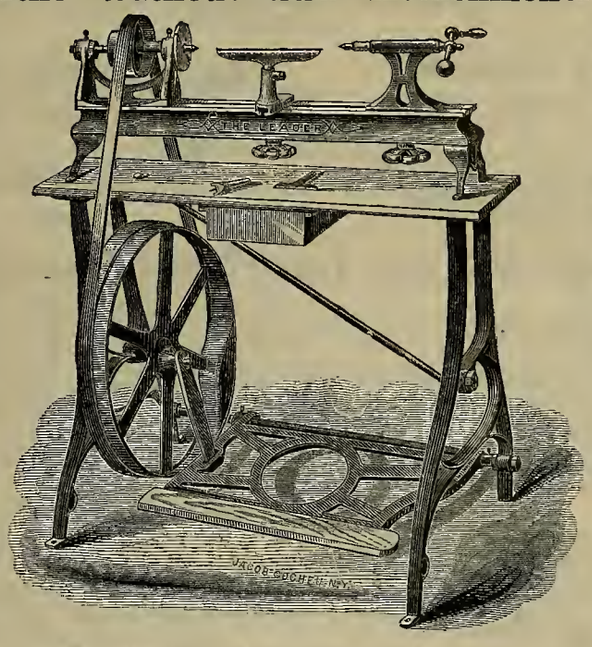

Material eighteen inch as long and eight inches in diameter can be turned on it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face-plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
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Chuck, for drills ⅜ and under, Price.....$1.50
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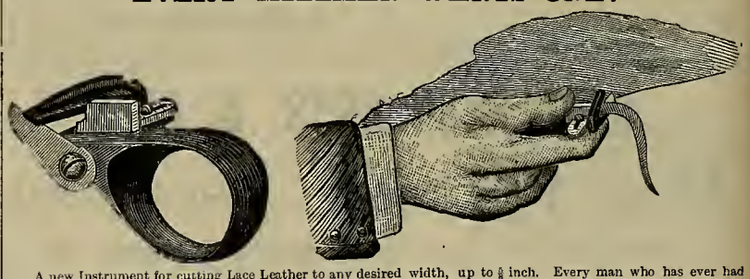

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 12, 1879.

VOLUME XXXVIII Number 15.

DOUBLE SHEET—24 PAGES.

An Arizona Mining Camp.

In our double sheet edition this week we give due prominence to matters relating to the new mining country to the southeast of San Francisco, embracing Arizona and the Mexican State of Sonora. These regions are being brought close to us by the advance of the Southern Pacific railroad and lines of travel connecting therewith. Our readers will find on nther pages an able article on the mineral resources of Sonora by an engineer whn has had long experience in the region which be describes. Another valuable contribution to the growing literature concerning Arizona, will be found in one of a series of articles writtcn for the PRESS by Capt. W. H. Seamans, who has lately returned from a protracted tour through the Territory. This article is illustrated by a map of tbe Big Bug mining district, wbich is described.

By way ot varyiug the character of the Arizona matter which we present in this issue, we give on this page an engraving of interesting views in the Territory. One is of an Arizona mining camp, the location of tbe works of the Toltec Syndicate. The engraving is fron Conklin's "Picturesque Arizona," which accords considerablo space to tbe resources and operations of this company.

The Toltec camp is in the Aztec district in southern Arizona. The engraving shows the characteristic vegetation of tbe region and the style of tbe buildings wbicb mark young camps. Concerniug tbe section in whicb the Toltec is located, we cannot do better than to quote from Col. R. J. Hinton's "Handbook of Arizona" tbe following paragraphs:

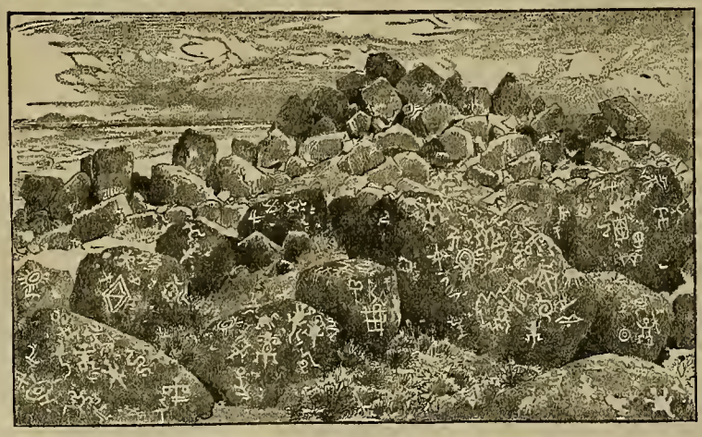
The road to the Toltec camp, now a busy little center of mining activity, and for the time being the working head quarters of the Aztec Syndicate's operations, whence everything connected witb the works on the Aztec, Inca and Iturbide mines is directed, branches from the Tumacacori wagon road at some distance west of the old Hacienda. Crossing another deep and rough arroyo, down which during the rainy season quite a body of water pours, it passes for about three miles over a comparatively level mesa, rising gradually and having a more rugged aspect than the route up from the Mission. It is flanked on the west side by high castellated cliffs, bold and striking in form, of dark porphyry and white tufa, and on the other side by the south-by-east spur of the range itself. As you journey, upon the right the eye notes the fantastic outlines of the high colored bluffs, and takes in a hroad expanse of country, far beyond tbe Sonora line, and embraces the Oro Blanco on nne side and the Patagonia's dim outlines on tbe nther. Cacti become numerous, while the dwarf oak and mesquite remain abundant. Toltec camp lies at an elevatiou of 3,000 feet, in a small valley made hy the slopes of tbe range. Opening up to the southwest is the mouth nf a small but remarkable canyon, and towards the north leading up, the arroyo follows the range into a bewildering network of mineral lodes and veins. In May, 1877, the only sign of precediug activity visible was a little adobe house with a small nre heap near by. There is considerable and increasing evidence of industry now-a-days. The valley affords space for a mining town which is already beginning to grow thereat. The waters that come down from the mountain, cutting and wearing tbe granite, bave strongly defined the arroyo, and passing some distance beyond the camp, have cut a passage througb the immense quartziferous ledge on whicb the Empress of India lode has been traced, and falling down a distance of 200 feet form a cool deep pool below, which is apparently fed also hy a living spring. It has never yet been found dry even in the hottest of seasons. Tbe water has worn a deep cleft tbrougb the adamantine rock, looking down whicb the eye can readily detect strongly defined indications nf the presence of mineral veins. The Aztec district contains a large number of mines, located hy the Syndicate and hy private prospectors. It commences at the east end of the Empress of India mine, runs west of north along the eastora boundary of Tyndall, thence due north two milcs, thence due east three miles, thence due south six miles, and from there westerly to the point of starting. Everything possible is favorable to cheap mining and rich ores.

We also give on this page a view of objects of historic interest, the "painted rocks," which

THE TOLTEC MINING CAMP, AZTEC DISTRICT, SOUTHERN ARIZONA.

Mr. Conklin secured for his "Picturesque Arizona."

Mr. Conklin's account of his observations on the painted rocks is as follows: One of the leading features of interest to the traveler in the mesa laud of Arizona is the system of pre-historic landmarks be is constantly coming in contact with on all sides. Man has, as yet, however, derived very little positive knowledge of them from any research or investigation, and



THE PAINTED ROCKS OF ARIZONA—Pedras Pintados.

they remain to this day a source of speculative interest to the traveler, from the time he leaves the Colorado, at Yuma or Ehrenberg, uutil he completes bis journey. It is in these features that Arizona presents herself as the land for the archæologist, the psychologist, and all curious minds. Among the foremost of these are the "Painted Rocks" (*Pedras Pintados*).

About six miles from Oatman's Flat, on an extensive plain, encircled by the famous Arizona mountains, is to be seen the largest and most perfect specimens of these Painted Rocks (*Pedras Pintados*). They are in tbe Gila valley, 120 miles from Tucson, latitude, 33°, longitude, 113°. To stop and examine these wonders of the pre-historic age, is only to enhance the great enchautment that waylays the traveler in Arizona on every hand. They are a mass of rocks, evidontly piled by some physical power, ages ago. They are massed tngether in a beap about 50 feet high, with a proportionate base; and wbile some are of a size tbat may be lifted by a man, otbers might he ranked with boulders. On these rocks or stones, are various figures and images. Figurcs, geometrical, comic, and anatomical. There are squares, circles, triangles, crosses, snakes, toads and vermin, men without beads, and dogs without tails.

DIVIDEND-PAYING MINES WANTED. — Tbe New York *Mining and Engineering Journal* says there is a market in the East for sound, dividend-paying mines, and the shares of such properties, hut none whatever for mines badly managed or of duhious merit. Eastern investors have had enough of these and seem even more averse to having anything further to do with them than the people of this coast.

SIERRA NEVADA MINE.—Instead of controlling that property, as had been generally supposed, it is now stated that the Bonanza firm do not own any of the Sierra Nevada stock, the active assistance extended by this firm to Skae, at the time the latter entered upon a more vigorous development of tbe mine, baving lead to the above belief.

Gold on the Skagit.

The finding of gold on Skagit river, Washington Territory, although announced as a recent discovery, appears not to he an altogether new thing. As we learn from Prof. Amos Bowman, who is familiar with that country, gold mines, both placer and quartz, have been known to exist there for a number ot years. Several quartz mills have, in fact, heen running in the country east of the Cascade range for some time, and the Indians living on the upper Skagit, when coming to the towns on the sound to trade, have long heen in the babit of paying for their purcbases witb gold dust. The whites, in prospecting, also found gold along this stream, but not enough to warrant them in stopping to gather it, therefore it was concluded that they had failed to strike the locality where the Indians had obtained their dust, which was coarse and of good quality. This place has, most likely, at last heen found, and the discovery announced as one freshly made.

The Skagit river, which heads in the Cascade mountains, and runs west, emptying into Puget sound, is navigable for sixty miles, affording easy means for getting up near the mines, wbich, however they may pay fair wages for a sbort time, are probably nf no great extent.

The country east of the Cascades is auriferous in spots, all tbe way from Samilkanim river south to the Peshastin. In tbe northerly part of this belt, are situated the Kootenai mines, worked from the time of their discovery, in 1859, more or less for ten or twelve years, and which though they lie just over the line in British Columbia, have heretofore been approached, for tbe most part from tbis side, up the Columbia river. The Skagit, heing navigable for so long a distance, and flowing clean across the Cascades, through a low pass, will most likely be the route taken by the emigration to the region east of that range hereafter. Parties going in from Puget sound will, of course, proceed by this route. The Skagit Pass, lying so low, and being hut little obstructed, was one of those selected for the passage of the Northern Pacific railroad through the Cascade mountains, and is as likely to be the one finally adopted for that purpose as any other.

CITY HALL SANDSTONE.—Some time ago a reputable member of the Real Estate Protective Association made an allegation to that body, that worthless or unfit stone was heing used in the construction of the new City Hall. The matter was taken in hand by the executive committee, and at a meeting of the Association held on the 5th inst. a partial report on the subject was made. Several samples of the rock were examined by the association, especially that alleged to be used for keystones and arches. The stone was very brittle and friable, can he crushed in the fiugers, and dissolves rapidly in water. The following letter from Mr. Thomas Price, a well-known scientist, was also presented: "The rock you sent me to-day for inspection and opinion as to its value as a building stone, has been examined carefully, and I have no hesitation in pronouncing it a very poor article, and such as I would not recommend any one to use for building purposes. Disseminated through the mass are particles of clay that would tend to crumble the already soft rock on the slightest pressure. I do not thiuk tbat this rock would harden on exposure—that is to a sufficient extent so as to make it valuahle as a building stone." The stone is taken from a quarry on the Almaden road, five miles from San Jose. The results already obtained were deemed sufficient to justify a more extended investigation, and the matter was again referred to the committee, who will report fully at the meeting two weeks hence.

THE old railroad depot at Sacramento is soon to be replaced by a larger and more ornamental one.

The Genesis of Cinnabar Deposits.—No. 2.

[A paper read before the Geological Section of the California Academy of Sciences, by S. B. Christy, Ph. B.]

Third—Experiments on the Solubility of Mercuric Sulphide.

The great objection to accounting for the deposits of cinnabar in the wet way has always been the difficulty of finding any solution existing in natural waters capable of dissolving this substance. The experiments of R. Weber, cited above, show that as soon as the free alkali is neutralized, either by carbonic or sulphydric acid, the mercuric sulphide is precipitated completely from its solution in alkaline sulphides, and as free alkali is not known to exist in any mineral waters, the question has still remained: "In what has this substance been dissolved if we are to suppose it to have been formed in the wet way?"

The classic researches of Daubree‡ on metamorphism, and those of De Senarmont§ on the formation of metalliferous veins in the wet way, as well as the fact that these solutions must have acted originally at higher pressures and temperatures than those of the atmospheric waters, led me to carry out the investigations which I present to your notice.

Impressed with the idea that a moderate increase of pressure and temperature might possibly bring about the desired results, I was led to adopt a more easily manageable apparatus than that used by the investigators already meutioned. For this purpose I used a Papin's digester of gun-metal about seven and three-quarter inches high, three and a half inches in outer diameter, and five-sixteenths of an inch thick. This vessel was calculated to stand with safety a pressure of 650 to 700 pounds per square inch. It was provided with a safety-valve, so that the pressure could be easily regulated at any point. It was heated in a bath of iron filings, so that the temperature could be approximately determined as an additional check. The whole was surrounded by a sheet-iron shell to guard against danger from explosions. The digester was heated by an ordinary Bunsen burner. The substances to be experimented upon were enclosed in glass tubes, usually sealed at both ends, but occasionally open at the top, so as to allow the contents to slowly evaporate under pressure after the water had evaporated from the digester through the safety-valve.

The only disadvantage from using this form of apparatus was the difficulty of determining when the water was entirely evaporated. This led to several explosions of sealed tubes within the digester, and the consequent loss of many days' work. The joints were all made with a lead packing, as paper, leather, etc., would not resist the high temperature at which the experiments were conducted.

The highest temperatures reached were in the neighborhood of 250° (482° F.) The thermometer at the bottom of the bath of iron filings indicated 360° C., and at the top 150° to 200° C. The first experiment made was with a tube with a solution of amorphous mercuric sulphide and potassic sulphydrate. The tube was open at the top and its contents allowed to evaporate under a pressure of 150 pounds per square inch after the water had evaporated from the digester. The temperature was about 180° C. The operation was continued five hours. The liquid contents of the tube were reduced to one-half. The sulphide was entirely changed to a red powder, and the next day the tube was found to contain a beautiful coherent mass of crystals of cinnabar, recognizable by the naked eye and simulating the crystals which occur in nature very perfectly. They appeared to be rhombohedral, like the natural mineral, although I have not been able to determine this with certainty.

Subsequently a large number of experiments were made, all with closed tubes, upon various solutions, for the purpose of determining the action of the different reagents. The temperatures varied from about 200° to 250° C., and the pressures from 260 to over 500 pounds per square inch. The determination of the pressures were not entirely exact, owing to the difficulty of making the valve seat bear with perfect uniformity. The duration of the heating varied in the different experiments from three to ten hours, and in each case the digester with its contents was allowed to cool undisturbed till morning. The results of these experiments are as follows:

Solutions of sodium bicarbonates did not change the amorphous variety of mercuric sulphide to cinnabar. Solutions of water glass were equally powerless, but when through either of these solutions sulphydric acid was passed and the tubes were again treated in the digester the transformation took place. Polysulphide of potassium as well as sulphydrate changed the amorphous sulphide very rapidly and completely. The presence of carbonic acid seemed to retard the formation without being able to prevent it. The cinnabar formed was usually in the state of micro-crystals, like vermilion, but often they were larger and more like the native cinnabar in appearance, though they were so minute as to make the determination of their crystalline form extremely difficult. In all cases where the transformation had taken place the liquid would stain the skin deep black, as is usual where mercuric sulphide is dissolved in alkaline sulphides. This would be an additional proof, if one were required, that solution had taken place.

Finally, I was led to try the effect of heating the amorphous sulphide with New Almaden Vichy water, to which sulphydric acid had been added. This water as analyzed by E. Picquet, Mining and Scientific Press, Vol. 18, p. 360, has the following composition:

Bicarbonate of soda	50.3 grains.
Bicarbonate of lime	8.0 "
Sulphate of lime	16.5 "
Sulphate of magnesia	3.0 "
Chloride of sodium	8.4 "
Oxide of iron	1.2 "
Silica	traces
Carbonic acid	28.2 "

This amount was contained in one bottle of two pounds.

Sulphydric acid was passed into this water for half an hour, an equal amount of the mineral water and some black mercuric sulphide was added to it, and the mixture was treated in the digester, while a similar experiment was carried on at the ordinary pressure of the atmosphere, and 100° C. The temperature of the digester was not more than 180° C., and the pressure 140 to 150 pounds. The time in both cases was two hours. The sulphide which was treated in the open air was unchanged, even when examined with the microscope, while that treated in the digester was brownish red, even to the naked eye, while under the microscope it showed itself to be composed of a mixture of a small amount of, as yet unchanged, sulphide, and a larger amount which was completely transformed to cinnabar. Crystals were not visible with the powers used.

This mineral water, therefore, with the addition of the single ingredient of sulphydric acid, is capable, when heated, of dissolving and transforming mercuric sulpbide, and depositing it from solution in the crystalline form when it is slowly cooled.

Fourth—The Relative Probabilities of the Rival Theories.

Without attempting the impossible task of tracing the salts of mercury through all their successive changes, from their existence as vapor in the nebulous mists, to their present position in the existing ore deposits, it is, nevertheless, altogether probable that they would be precipitated from solutions in some form or other, at a period very soon after the globe had cooled down to a point which would allow them to exist in solution, and they would occur in some insoluble form, very probably as sulphide in the very earliest sedimentary deposits, and consequently would, if their position had remained unchanged, now exist at such a depth beneath the present surface, that man would never have known of such a metal as mercury. But as the sedimentary deposit increased in thickness, the deposits being cloaked at these points to a greater degree would be invaded by the interior heat of the earth, and according to the sublimation theory, would at last become so hot that the sulphide would become changed to vapor as soon as the pressure was relieved at any point on the sudden creation of a fissure by any mechanical agency, and then the vapors escaping through these fissures, would, by their elastic force, rise upwards until they reached a cooler locality, where they would be slowly deposited. It is, of course, impossible to settle such a question by observation, but reasoning *a priori*, it is probable that such action would take place under these circumstances.

The sudden invasion of igneous rocks among such sedimentary deposits would also cause a similar action if fissures above existed, capable of releasing the tension of the vapor and of furnishing the lower temperature necessary for condensation.

Even granting this to be a possible case, it is altogether improbable that such action is connected in anything but an indirect way with the genesis of the existing ore deposits, with the possible exception of the invasion of igneous rocks extending nearly, or quite, to the surface. This latter condition is certainly not the rule, but the exception; and even when it does exist, there seems to have been subsequent agencies active in giving rise to the deposits as they exist, which are not igneous.

In support of this position are the following facts:

In the first place cinnabar volatilizes only at just below a red heat (about 500 C.) when exposed to the ordinary pressure of the atmosphere. It is a well-known fact that the increase of temperature as we descend into the earth from the surface is about 1° C. for every 100 feet. At this rate of increase it would take a depth of nearly 50,000 feet, or about nine and a half miles to give this temperature. Now at New Almaden where the associated rocks are certainly not igneous, we find the cinnabar outcropping at the surface. This hypothesis would, therefore, necessitate the removal by erosion of nine and a half miles of superincumbent strata. The recent age of these rocks (pronounced Cretaceous by Prof. J. D. Whitney, Geological Survey of Cal.) evidently precludes such an hypothesis. Furthermore, the theory that the heat produced by the crumpling of the strata would be sufficient is not well founded, since the action usually takes place so slowly that the heat produced is dissipated by conduction to such an extent that the temperature can never be greatly increased at any one time. If we assume that the rate of increase of temperature was three times what it is at present, we still should have to go to a depth of three miles before any such temperature would be reached.

Not only so, but at such great depth the enormous pressure of the superincumbent mass would of course greatly increase the temperature necessary to volatilize the cinnabar. This fact is illustrated in the well-known case of water. The natural rate of increase of temperature of the earth is not sufficient to convert the water into steam at the existing pressure excepting in the presence of local igneous rocks, as is shown by the following table taken from Pfaff's *Geologie als Exacte Wissenschaft*, p. 112:

Depth In feet.	Temperature Centigrade.	Pressure of Water In Atmospheres.	Tension of Steam In Atmospheres.
10,000	100	300	1
20,000	200	600	15.3
80,000	800	2400	1416
100,000	1000	3000	1877
200,000	2000	6000	2403

The third column gives the weight in atmospheres of a column of water of a hight equal to the depth; this is the minimum pressure to which a substance can be exposed, unless we suppose an extensive fissure filled only with air and extending from the given point far upwards. The fourth column gives the tension of steam at the temperature correeponding to the depth, calculated according to Regnault's formula. It is evident that under these conditions the water will never become hot enough to boil at the existing pressure except in local cases where there are eruptions of volcanic rocks. Although there have not been, to my knowledge, any determiuations of the elastic force of cinnabar vapor it is probably less than that of steam, and the above reasoning will apply with even greater force to this case than it does to that of water, always excepting the cases of extensive fissures and the presence of volcanic rocks.

In the next place, the deposits themselves, as indicated in our study of the principal cinnabar deposits, do not usually show the signs of true fissure veins, but are rather found irregularly disseminated in layers and impregnations, and volcanic rocks are not usually found in sufficient proximity to give the amount of heat requisite to cause the sublimation.

In the third place, the formation of many of the ore bodies cannot be explained upon the sublimation hypothesis. Many of them, notably that of New Almaden, contain carbonates so intimately mixed with cinnabar that the conclusion is irresistible that they were formed *in situ* in the wet way. The occurrence of quartz and bitumen intimately mixed shows the same thing.

Again, M. Kuss,* himself evidently inclined to the sublimation hypothesis, admits regarding the Almaden deposits: "The material of the quartzite which is wanting to-day in the rocks impregnated with cinnabar, certainly could not have been missing, either at the time of the first deposit of the beds or after the strong pressure which compressed and straightened them. How could this disappearance of siliceous matter be effected; matter unattackable by all the reagents which we can imagine to have intervened during the epoch of the formation of the veins of cinnabar?" This disappearance of siliceous matter is certainly inexplicable by the sublimation theory, but by the supposition that the cinnabar was deposited from solution in a mixture of alkaline sulphides and carbonates, it would be not only explained, but also would be a perfectly natural consequence of the main supposition.

Still, again, all the minerals mentioned as occurring with the various ores of mercury in the first part of the paper; such as iron pyrites, blende, galena, fahlore, copper pyrites, etc., quartz, heavy spar, calc spar, dolomite, spathic iron, gypsum, etc., have all been produced in the wet way by De Senarmont and others. The production of bituminous material similar to idrialite has also been accomplished in the same way by heating organic matter with water in closed tubes at high temperatures.† In fact this transformation is invariably regarded, not as the result of dry distillation, but as the effect of heat in the presence of water. And, if the pressure was great enough to volatilize the cinnabar, it is probable that the much more volatile hydrocarbons of the original organic matter would have disappeared, and we should have *anthracite* or *graphite* instead of bitumen, as we do in most of the cinnabar deposits.

In addition to this, we have shown that the sulphide of mercury, at comparatively moderate temperatures, is dissolved by solutions of alkaline sulphides, even though in the presence of carbonic acid, that pressure aids rather than retards this solution, and that cinnabar is deposited from it in cooling. In one case we have shown that by adding sulphydric acid to the mineral spring water now existing in the neighborhood of one of the most noted of these deposits, we were enabled to produce the same effects. For various reasons, which it is needless to state here, it is probable that this spring once contained sulphydric acid, and we have therefore, in the case of the New Almaden mine at least, a sufficient cause for the deposit without invoking the sublimation theory.

Again, the occasional occurrence of metacinnabarite is easily explainable by the sudden dilution of the depositing waters by other springs, by fresh water from above, or by the local mixing during the crystallizing process with carbonic or other acid gases. No other theory so well accounts for the intimate mixture of the two varieties, crystalline and amorphous, so well described by Moore. (*Ueber das Vorkommen des amorphen Quecksilbersulphids in der Natur.*)

Finally, the almost universal occurrence of these deposits in metamorphic rather than in true igneous rocks accords well with the theory that these deposits *in situ* are the immediate result of the action of alkaline carbonates containing also alkaline sulphides.

There are still many other points of interest in this connection which are difficult to understand. Such, for example, are the wide-spread association of serpentine and other magnesian rocks, and of the bituminous substances with cinnabar. It is possible that these are conditions as well as mere concomitants. Lastly, there remains the occurrence of native mercury to be explained. Unless we regard it as the effect of the local oxidation of a very stable compound its appearance is well nigh inexplicable upon either hypothesis.

University of California, Berkeley, Dec., 1878.

‡*Annales des Mines*, Series v. t. 16.
§*Annales de Chimie et Physique*, t. 32, p. 129.

*Memoirs sur les Mines et Usines d'Almaden, p. 44 Translation of same by writer, p. 21.
† Daubree "On Metamorphism," *Annales des Mines*, Series 5, Vol. 16, Part II, end of Chapter IV.

Relative Economy of Gas and Electricity as Sources of Light.

The Report of the Commission of the Municipal Council of Paris, furnishes the *first authentic data* in relation to the economy of the working of the electric light in that city. A Jablochkoff lamp is estimated to give a quantity of light equal to 11 gas lamps, consuming each 140 liters per hour. Hence, the quantity of gas consumed to produce the same quantity of illumination as one Jablochkoff lamp, would be 1,540 litere per hour. The price paid by the city to the gas company is O. fr. 15 cent. per 1,000 liters; hence, the expense of 1,540 liters would be O. fr. 23.1 cent. per hour. A careful estimate of the aggregate expenses of *each* Jablochkoff lamp shows that it is O. fr. 73 cent. per hour, so that we have the cost of 11 gas lamps = one Jablochkoff lamp = O. fr. 23 cent. per hour; cost of one Jablochkoff lamp = 11 gas lamps = O. fr. 73 cent. per hour. Hence, the Jablochkoff light is nearly 3.2 times as expensive as the gas light. This estimate is based upon the expense incurred in producing the light for 62 Jablochkoff lamps per hour, which required 77 horse-power.

The Commission proposes to pay the Jablochkoff company (which it accepted) O. fr. 30 cent. per lamp per hour for 83 lamps for one year. The total number of burning hours per year is estimated at 183,621 for the 83 lamps. Hence, the cost per year = 55,086 francs; cost of gas per year = 21,041 francs, for illuminating the *same places*. Hence, the *excess* of expense to city, in using electric light in place of gas light, will be 34,090 francs per year. But this credit is asked for in the *interest of science*.

People seem to have forgotten that only three years ago a competitive trial of gas and electricity was made in London in the Clock-Tower of the Houses of Parliament. Each of these lights were tried for several months, and after careful examination, *gas was successful*. The more recent experiments in London have *not* been in any degree more satisfactory.

"There is, however," says Mr. Preece, "a defect in gas light which remains to be eradicated, and that is the *color* of the light. The one great advantage which the electric light has over the gas is that the electric light, owing to its very high temperature, produces rays of every degree of refrangibility, and, therefore, as an illuminating power it is equal to that of the sun. But gas light, owing to the lowness of its temperature, is deficient in *blue rays*, and is, therefore, not so effective in discriminating colors as the electric light."

And it is proper to add, that a decided advance towards perfection in this direction in gas lighting has already been made in the "Albo-Carbon" process, by which the gas is enriched with the vapor of *napthaline*. The intensity of the light of a gas-burner has thus been improved from five to twenty times.

It has been proposed to avoid the *enormous loss* of the electric light produced by *sub-division*, by the *diffusion of a single light*. This plan has yet to be practically tested. Mr. Preece has shown "that when adding to the lamps by inserting more of them on the same circuit, or on a circuit so that the current is sub-divided, the light emitted by each lamp is *diminished* in the one case by the *square*, and in the other case by a *cube* of the number of lamps inserted."

There can be no question that the use of electricity for the production of light is a very *wasteful* as well as *costly* process; for the energy generated in the machine is *not* all consumed in the *lamp*, but is *distributed over the whole circuit*. It is *not*, therefore, as in the case of gas, *utilized exclusively in the place where it is wanted*. A very large fraction of the electric energy is wasted in maintaining the current required to produce the light.

Immense Glacial Remains.—Prof. F. V. Hayden says that on the east side of Wind River peak, Wyoming Territory, and on the east hase of Fremont peak, the remains of the huge glaciers which once covered the region have been discovered. On the west side of Wind River range, the moraines and glaciated rocks were found on an immense scale. He thinks on this side a glacier must have formerly existed having a length of 80 miles and a width of 12 miles with arms extended up the gorges of the stream to the very water divide.—*Eureka Sentinel.*

The nomination of Clarence King as Director of the Geological Survey has been confirmed by the United States Senate.

MECHANICAL PROGRESS.

Telegraphic Messages through Pneumatic Tubes.

Great are the economies of machinery. Two years ago the Western Union Telegraph Company came to the conclusion that the business of getting messages from the main office on Broadway to Wall street, New York, and back was costing the company and the public more than was necessary. In order to cheapen the expense of the large volume of business emanating in that part of the town, the company laid brass pipes, properly protected from the moisture, down Broadway and Wall and Broad streets to the Stock Exchange and the branch telegraph office there, and other pipes down to the Cotton Exchange, and to the branch offices near by there.

These were pneumatic tubes two and one-fourth inches in diameter. They were four in number—two of them "up" tubes, as they are called, worked by exhausting the air and making a vacuum, and two of them "down" tubes, worked by pressure. The messages were rolled up thereafter and placed in little leather boxes, open at one end and about six inches long, and shot back and forth between the main and branch offices, instead of being sent by messenger boys or telegraphed over the wires. The company is now exchanging from 3,000 to 4,000, and more, messages a day, through their pneumatic tubes, between the main office on Broadway and the branch offices at and near the Stock and Cotton exchanges.

It saves thereby the labor of at least 25 telegraph operators, and the public is saved much expense. The tubes are, two of them, 2,100 feet long (the Wall street tubes), and two are respectfully 3,000 and 3,500 feet long. They are worked by a steam engine which has a capacity of 76-horse power, but which is never called upon for half its resources. An engineer and four boys at the tubes are all the employees needed in place of the 25 skilled operators.

This system has worked so well in the business emanating in the commercial and financial quarters of the city, that it is to be extended to a new quarter, namely, Printing-House Square. And now pipes are being laid to connect the principal newspaper offices with the telegraph office. There will be only one pipe carried to Newspaper Row, it will be a down pipe, and will carry the loads of both special and Associated Press dispatches, which are sent daily and nightly from the Western Union building to the offices of the daily press. The tube will be operated, however, from time to time as an "up" pipe, after the proper signals, so as to bring back the empty boxes. This pipe will be two and a quarter inches in diameter, and 9,000 feet of it will be employed. Only the morning newspapers are taking advantage of the new system. The offices which have the tubes will have great gainers. They will get their dispatches 15 minutes earlier, at the least, an important matter late at night. The message will be delivered in 30 seconds. The Western Union and Associated Press will be able to save the expense of a great crowd of messenger boys. The pipes are being laid under the direction of Mr. Brown, Assistant Superintendent of the Western Union.—*N. Y. Corr. Philadelphia Press.*

How Millstones are Made of Glass.

The *Manufacturer and Builder* calls the attention of manufacturers who can cast heavy pieces of glass, and also of millers, to a recent German discovery, that the finest flour is produced by those millstones which have the most glassy texture and composition, and the consequent discovery that pieces of glass combined in the same way as the French burr and similarly grooved on their surfaces, will grind better than the burr millstones. The consequence of this discovery has been the invention of the glass millstones now made by Messrs. Thom, and used in Germany and Borkendorf with great satisfaction, as it is found they grind more easily, and do not heat the flour as much as is the case with the French burr stone. In grinding grist, they run perfectly cold.

In order to make such stones, blocks of glass of from 6 to 12 inches wide are cast in a shape similar to the French burrs, but more regular and uniform. They are connected with cement in the same way, and dressed and furrow-cut with picks and pointed hammers; but we believe that diamond-dressing machines might be profitably applied. It is said that these millstones, made of lumps of hard glass, do not wear away faster than the burr stones. Stones of four and a half feet in diameter, driven by six-horse power, ground 220 pounds of flour per hour, and did it while remaining cold. The grist is drier, looser, and the hull more thoroughly separated from the kernel than is the case with other stones.

If all this turns out to be correct, it is a valuable discovery, especially when we consider the expensiveness of good blocks of burr.

Experimenting.—The Pennsylvania railroad depot at Altoona was lighted by electric light recently. It produced a brilliant light, and gave general satisfaction. It was an experimental trial, but the company have no idea at present of adopting it.

Transmitting Power by Shafting.

In order to transmit the motion and power of a shaft, fitted in bearings, to one or more shafts occupying any desired and changeable position, Mr. Wilhelm Ritter, of Altona, Germany, proposes over one of the ends of a motive power shaft to place a box of a right-angle shaped bracket, and a conical wheel fastened to the outer end of this shaft. The other angle of the bracket is likewise formed as a box, the outer part of the boring being enlarged for the reception of a cylindrical prolongation of a similar bracket, and is furnished with a set screw to secure the second bracket, which can be turned within the enlarged boring of the first one in any desired position of a circle. A short axle passes through the box of the second bracket, the corresponding projection and the box of the first bracket, and each end of this short axle is furnished with a conical wheel fastened to it, and one of these wheels is in gear with the before-described wheel of the motive-power shaft, while the other conical wheel is in gear with a similar wheel fastened to the end of a shaft that revolves in the boring of the other box of the second right-angle bracket. By means of this gearing the shaft of the second bracket is put in motion, and the axis of this shaft can be turned into any position within the plane of a circle, after loosening the before-mentioned set screw, and turning the second bracket in the boring of the first one. After having brought the shaft of the second bracket in the desired direction, the position of the two brackets to each other is secured by means of the set screw. By means of two further pair of conical wheels, two more angle brackets of similar construction and connection, and another short axle, the transmission can be continued upon a third shaft, and the movableness of this third shaft will be greatly increased. The transmission of motion and power can in such manner be continued as far as necessary to other shafts, and the end of the last shaft may be constructed for the reception of a tool, or a pulley may be placed upon this shaft for driving a tool or implement. The conical wheels can be furnished with protecting covers.

A New Steam Wagon.

A new style of vehicle, designed to be propelled by steam, has recently made its appearance in London. The carriage closely resembles an ordinary dog-cart; the shafts are very short, and incline together, meeting two feet in front of the dashboard; between them there is a third wheel, working upon an upright shaft, which could be turned by a handle placed the same as that of a bycycle; this handle is worked by reins in the hands of the driver. The fuel used is benzine, and this burner used is described as being no larger than an ordinary bat. The steam is generated in a coil boiler of copper. The tubs of which the boiler is composed is stated to have been tested to a pressure of 2,000 pounds per square inch. This is, however, an unimportant matter, as the explosion of a coil boiler is never dangerous, and only results in putting out the fire and stopping the engine. The ordinary steam pressure is about 60 pounds. The vehicle is described as working very handily and being under very complete control. As only three or four persons are to be carried, the amount of power required is merely nominal. The speed, if we are not mistaken, was reported at something like 10 miles per hour. If there was any market for steam road wagons, or rather steam pleasure carriages, there would not be the least difficulty in producing them. The machinery needed is very light and can be stowed away beneath the seats or in the box, while the quantity of coal or benzine needed is very small. The speed of such machines is almost unlimited. Steam coaches on good roads have made as high as 35 or 40 miles in an hour, and from 12 to 18 were rates that were regularly maintained by some of the English steam passenger coaches before the railways drove them off from the common roads.

Brakes for Freight Trains.—The Master Car-Builders' Association, of New York, has recently discussed the subject of train brakes for freight cars. Most of the freight cars on American lines have hitherto been using the old windless brakes, worked by brakemen. In a train of 50 or 60 cars, often not more than three or four brakemen are employed, and hence a great deal of time is lost in applying the brakes to all the cars. For these and other reasons, freight trains hardly ever exceed a speed of 12 miles an hour. What the association seeks to accomplish is a uniform train brake, under the control of the engineer. Various brakes were mentioned, as the Stuart power brake, the Westinghouse brake, and other vacuum, steam and air brakes. The elevated railroads in New York use air brakes, and the Hudson River and New York and Harlem River railroads use automatic brakes on their passenger trains, but the companies have not yet been able to agree on any particular brake, partly because the appliance of the brake to the cars would entail considerable expense. Often cars of 20 or 30 different companies are run on the same train.—*Iron Age.*

A New Plan for Grain Elevators.—A recent number of the Toledo *Blade* gives an account of some experiments which have lately been made by Alfred Wilkin, of Toledo, for the construction of a machine for the movement of grain as if it were water; that is, for pumping it up in elevators by atmospheric pressure, or the exhaust-process which is applied to the celebrated Westinghouse atmospheric brakes. If this meets with the success which it promises, it will constitute an important improvement in handling grain.

Iron-Producing Countries of the World. The leading iron and steel-producing countries of the world, in the order of their importance, are enumerated as follows: Great Britain, United States, Germany, France, Belgium, Austro-Hungary, Russia and Sweden. These countries produce 98½% of the world's annual produce of iron and steel, and all were represented at the Paris exhibition except Germany.

SCIENTIFIC PROGRESS.

The Gyroscope—A New Law of Motion. (?)

The discovery of a new law of motion at this day might be considered somewhat apocryphal, and also that a clear solution of the mysteries of the gyroscope was within the grasp of the ordinary man of letters. Mr. James McCarroll, a resident of New York, appears to have worked out a theory respecting these two points, which certainly deserves the attention of the savants. Mr. McCarroll avers that all bodies moving in right lines change their distance from the center of gravity, and, consequently, their weight at every moment, and that when moving in curves, whether concentric with the circles of the earth or otherwise, the tangential force, antagonizing with that of gravity, serves to change their weight also. Hence he lays it down as a fourth law of motion that "a body is of uniform weight when at rest only."

In relation to the mysterious problem of the gyroscope, his demonstration is seemingly quite clear that a vertical wheel in motion does not press upon the same points of its bearings that it does when it is at rest, from the fact, as he alleges, that all the particles of matter in the periphery on one side of the wheel have a tendency to fly off at various angles in the line of the earth's gravity, and one of them directly in that line; while all the particles in the other half of the periphery have a tendency to fly off in a contrary direction, establishing an unequal distribution of force upon the axis and a minus and plus side of the wheel; as on the one side we have the earth's gravity, plus the tangential force of the wheel, and on the other its gravity minus that force. This, once admitted, the motion of the horizontal ring on which the vertical wheel revolves is apparent at once; for the ring, being free to obey any impulse given it in its own plane, simply retires before the plus side of the wheel and in a direction contrary to the revolution of the wheel itself. In explanation of the mysterious manner in which the whole weight of the gyroscope is sustained on one side of the upright pivot upon which the small projection from the horizontal ring rests freely, Mr. McCarroll says that when the vertical wheel is made to rotate so rapidly that the tangential force is in excess of that of gravitation on the whole mass, both ring and wheel will remain suspended, without any material support on one side of the upright, and be carried round the pivot upon which the projection from the ring rests, revolving more rapidly as the tangential force of the wheel decreases and is the more readily lent out of its plane, until, falling below the force exercised upon the whole mass by the gravity of the earth, both ring and wheel begin to gradually describe downward the arc of a circle vertical to a line tangent to the earth's surface, with the pivot for its center, and the axis of the wheel, together with the projection of the ring, for its radius, until, at last, the exhausted mass tumbles to the ground.

An Apparatus to Measure the Variations of Daylight.

It is greatly to be desired that a good and simple method be found of recording and measuring, with some accuracy, the variations of daylight throughout the day. This would render the weather record more complete, and it has an important special bearing on plant physiology. An attempt of the kind has lately been made by a German, Herr Kreusler, who has had made for him, by Liebertz, in Bonn, an apparatus with the following arrangement: It consists of a drum, fixed with its axis in the plane of the meridian, and adjustable so as to be at right angles to the sun's rays. This drum has its border divided into 24 hours—12 noon and 12 midnight being in the meridian plane. A strip of paper, sensitized with solution of bichromate of potassium, and having divisions which correspond to those on the drum, is placed round this. A second drum closely surrounds the first, and is turned by clock-work (from which it can be detached) once in 24 hours, in the direction of the sun's apparent course. The second drum has a slit for admitting light to the paper; its width is such that any point on the paper is exposed 20 seconds as the slit passes over. The whole apparatus is placed in the open air under a glass bell jar. Its arrangement gives little trouble; the paper strip has merely to be placed in its right position at night or under artificial shade (to avoid coloration), and the outer drum slid over and so attached to the rotating axis that the "insolation slit" is opposite the hour then present. The slit then begins to move round the inner drum correspondingly to the sun's course. The impressed slip, when removed in the evening, may be "fixed" by shortly dipping in water and drying between blotting paper, or it may not, being quickly read; it shows a mostly continuous succession of bands of various shades of black, or rather brown. For comparison, Herr Kreusler made a scale of 10 degrees of darkening, exposing strips of the paper a given time under different angles of incidents of light. Bands of the experimental strip that appear homogeneous are now measured with reference to breadth and intensity, and the sum of the products of those quantities is taken as a measure of the action of light rays falling on the instrument in a given time. The results are considered highly satisfactory.

Straw Dynamite.

By submitting straw to a boiling operation for 15 or 18 hours in an alkaline solution (salts of soda or of potash) at a temperature of 2° to 3° Baume, the straw is then easily disintegrated, and the fatty or other soluble matters which it contains are dissolved and carried off by the water, when the latter is withdrawn. The fibers are then triturated, and a perfect washing effected at the same time by means of either a cylinder stuff engine, similar to those used in paper mills, or by means of revolving millstones. During the trituration a current of water should constantly wash the fibers.

It is essential that this pulp does not retain any alkaline reaction, which is ensured by adding sulphuric acid or hydro-chloride acid in sufficient quantity that the washing water has a slightly acid reaction. The fibers thus triturated and prepared are, after having been perfectly dried, ready to undergo the reactions which render them explosive. To facilitate the manipulations, the pulp is treated by the paper machine, and should produce a sheet weighing about 300 grammes to the square meter. The thickness may be varied at will. The sheet thus formed is cut into fragments three or four millimeters square, immersed in nitro-sulphuric acid, and well washed. To transform the materials into nitro-cellulose more economically, the fragments may be immersed in a compound of nitrate of soda or of potash and concentrated sulphuric acid, the result being the same.

A nitro-cellulose of straw is, according to Mr. A. Lanfrey, of Chartres, France, thus obtained of a very energetic explosive property, and at the same time of great stability, qualities which the nitro-cellulose of cotton does not possess. The absolute stability of this nitro-cellulose, of such importance to explosive bodies, is thus explained. The fibers of the straw are formed of cellulose containing in the state of combination a considerable quantity of silica in the form of silicates. This silica acts in straw nitro-cellulose in the same way as in dynamite, fixing the nitro-glycerine, and giving a stability to this substance, which it does not possess when it is alone. For this reason he prefers oat straws, which contain more silica than the other straws, although they also give good products. The fragments of straw nitro-cellulose thus neutralized and retaining a slight alkaline reaction, are put, after having been drained, into a nitric solution containing dextrin, and if required powdered charcoal in a state of suspension. These solutions vary with the uses to which the explosive is intended to be put.

The Charms of Natural Science.—The Earl of Derby, in an address at the Edinburgh University, said: "Of the gains derivable from natural science I do not trust myself to speak; my personal knowledge is too limited, and the subject is too vast. But so much as this I can say—that those who have in them a real and deep love of scientific research, whatever their position in other respects, are so far at least among the happiest of mankind. * * No passion is so absorbing, no labor is so assuredly its own reward (well that it is so, for other rewards are few); and they have the satisfaction of knowing that, while satisfying one of the deepest wants of their own natures, they are at the same time promoting in the most effectual manner the interests of mankind. Scientific discovery has this advantage over almost every other form of successful human efforts, that its results are certain, that they are permanent, that whatever benefits grow out of them are world-wide. Not many of us can hope to extend the range of knowledge in however minute a degree; but to know and to apply the knowledge that has been gained by others, to have an intelligent appreciation of what is going on around us, is in itself one of the highest and most enduring of pleasures."

Nickel Plating without a Battery.—Prof. Slatba has invented and published a process for nickel-plating without a battery, which is said to give good results. The process is described as follows: To a dilute solution of chloride of zinc (5% to 10%) enough nickel sulphate is to be added to impart a decidedly green color to it, and the solution is then to be heated to boiling in a porcelain vessel. The clouding of the liquid from the separation of a basic zinc salt need not be heeded, as it will not interfere with the effectiveness of the bath. The articles to be nickel-coated—first carefully cleaned of oxide or grease—are to be suspended in the solution for from 30 to 60 minutes, the bath being kept at a boiling temperature. When the articles are observed to be uniformly coated, they may be removed, washed in water in which a little chalk is suspended, dried, and finally polished with chalk or other suitable material.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 20.		Week Ending Mar. 27.		Week Ending Apr. 3.		Week Ending Apr. 10.	
Alpha	21½	19¾	19½	16½	18¼	17	20	16¾
Alta	6¾	5¼	5.90	5	5¾	4½	5¼	3¾
Andes	50c	40c	40c	35c	40c	....	40c	30c
Alps	....	....	....	....	....	....	....	....
Argenta	1.45	1.30	1.10	90c	1	....	1.30	1.05
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	75c	....	....	....	....	....	....	....
Baltimore Con	1	....	1	....	1	90c	50c	....
Belcher	9⅜	8¼	8¾	6¾	8¾	6	6½	5¼
Belmont	70c	50c	50c	40c	45c	40c	40c	15c
Best & Belcher	21¾	18¼	17¼	15	16¼	15	16¼	14
Bullion	6¾	5⅜	5⅝	4½	5¼	4.95	5¼	4.70
Bechtel	2.60	1.20	2.15	1.70	1.90	1½	1.80	1½
Belle Isle	35c	....	35c	30c	35c	30c	45c	35c
Bodie	6¾	5¼	7⅜	6	7	6¼	10	7½
Benton	5	4	4.20	3	3½	3	3½	3
Bulwer	17	16¼	17	15½	16½	15½	21	18
Boyle	....	....	....	....	....	....	....	....
Black Hawk	4½	2½	4	2½	3½	3.20	4½	3.60
Belvidere	75c	50c	2	1.45	1½	1.30	2	1.30
Booker	1	80c	85c	60c	70c	50c	75c	50c
Caledonia	3¼	2.70	2.65	2.10	2.55	2.10	2½	2.15
California	6	5⅜	5⅝	4.80	5¾	4.90	5⅜	5¼
Challenge	3.65	3	3.20	2.10	3	2¼	2.90	2¾
Chollar	51	45	43¼	35½	46½	42	6¼	5¼
Confidence	18½	15½	14¾	10	14	11	14½	12
Con Imperial	1.60	1.35	1.35	1.05	1.35	1.05	1.55	1.20
Con Virginia	6	5⅞	5¾	4.60	5⅜	4.90	6	4.95
Crown Point	7	6⅜	5⅝	4¼	5⅜	4½	5¾	4½
Con Washoe	....	....	....	....	....	....	....	....
Champion	50c	25c	40c	25c	40c	15c	40c	30c
Concordia	50c	20c	15c	....	25c	....	35c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	....	5c	....	5c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	30c	20c	30c	25c	30c	25c
Eureka Con	27	24	22	18½	19	15¾	18	16
Exchequer	5⅝	5	4½	3½	5	4.80	5	4¼
Endowment	5c	....	25c	5c	30c	....	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4.60	4¼	4.30	4	6¾	3.35	3½	3¼
Gila	30c	25c	30c	....	....	....	30c	25c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10	9	9½	....	10	9	9½	....
Goodshaw	1¼	45c	70c	50c	55c	45c	50c	45c
Gould & Curry	12¼	10⅜	9⅝	7	6½	7	7½	6⅞
Hale & Norcross	18¼	16	13⅜	9⅞	11⅝	10¼	10⅜	7¾
Hillside	2½	2½	2¼	1¾	1¾	1	2	1¼
Highbridge	60c	60c	50c	40c	45c	35c	45c	35c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	20c	....	20c	15c	15c	....
Independence	1.85	1.70	1¾	1.60	1.60	1½	1.55	1½
Julia	5⅞	5¼	4¾	4	4.30	3.80	3.90	3.40
Justice	4½	4.10	3.80	3½	3.85	3.20	4.70	3.15
Jackson	7½	7	6¼	6	7	6	8	7
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6½	5¼	5	4¼	5	4½	5½	4.60
Kossuth	....	....	15c	....	10c	....	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.55	1.20	1¼	60c	1.15	80c	95c	75c
Lady Wash	1.65	1¼	1¼	1	1.10	1	1.20	70c
Leopard	90c	80c	1¼	85c	1	50c	75c	60c
Leviathan	35c	30c	30c	20c	30c	20c	50c	20c
Leeds	60c	50c	75c	60c	60c	....	60c	55c
Lee	....	....	....	....	....	....	....	....
May Belle	50c	25c	85c	30c	25c	....	25c	....
Modoc	55c	10c	....	....	....	....	....	....
Manhattan	2	1¾	1.80	1½	1½	1.10	2½	2¼
Martin White	7	6⅜	6½	6	6½	5½	6½	6¼
McClinton	2½	95c	1.30	1	1.30	1.10	1.30	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	41½	37½	35½	24½	33½	29	30¾	29
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	3	....	....	....
North Con Virginia	11½	9⅝	9¾	7½	9¼	7⅜	8	7¾
New York	60c	40c	80c	55c	80c	60c	70c	55c
Northern Belle	11¼	10¾	10⅝	9½	10	9½	10	9⅜
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	30c	35c	30c	25c	....	25c	....
Occidental	....	....	....	....	....	....	75c	....
Ophir	36½	33¼	31	24½	24¾	20¼	23	20¾
Oriental	25c	5c	75c	55c	60c	55c	60c	55c
Overman	14	11⅞	10⅜	9	11	9¼	9¾	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	2½	2	3½	1¾
Phil Sheridan	40c	25c	35c	15c	20c	10c	15c	10c
Potosi	....	....	....	....	....	....	5¼	4
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	6¼	6¼	5½	5½	6	5¼	4
Richer	1	75c	70c	65c	....	....	90c	75c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	16	14¼	11¾	9¾	11¼	9⅝	10¼	9
Seg Belcher	36	30	....	....	....	....	31	20
Sierra Nevada	49¾	45¼	47½	37	47	41½	43¾	40½
Silver Hill	2¼	1.90	1.80	1.30	1.60	1.35	1½	1.10
Silver King	8½	....	8	....	8	7½	7½	7
Silver Prize	....	....	....	....	....	....	....	....
Succor	45c	40c	1	30c	65c	40c	60c	50c
Summit	2¾	2	2.40	2	2¼	2.05	2½	2.10
Scorpion	1.35	1	1.80	1	1¾	1.40	1.65	1.50
Solid Silver	45c	40c	40c	30c	35c	....	35c	....
South Bodie	1	40c	50c	40c	35c	30c	60c	40c
South Standard	30c	5c	25c	15c	30c	20c	30c	15c
Star	65c	60c	50c	....	60c	50c	50c	40c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	2.90	1.70	2.30	1.90	2	1⅝	2	1¾
Tiptop	80c	60c	1.05	75c	75c	....	75c	70c
Trojan	25c	20c	20c	15c	20c	15c	20c	10c
Union Con	77	69	66½	53½	60	54½	56½	53
Utah	20	17⅝	18	12	15½	13¾	15	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.70	1.40	1.35	1	1.20	95c	1.10	95c
Wells-Fargo	20c	15c	10c	....	15c	10c	10c	5c
Woodville	25c	....	....	....	15c	....	....	....
White Cloud	....	....	1	....	....	....	....	....
Yellow Jacket	20¾	17⅝	16	11½	14⅝	13½	15¼	13

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 4.

340 Alta....4¼@4.60
150 Alpha....17@16⅞
150 Andes....30c
180 Best & Belcher...14@14½
570 Bullion....4⅞@4.70
435 Belcher....5⅝@5⅞
250 Benton....3
15 Crown Point....4⅝
425 Con Virginia....4.95@5
130 Chollar....41@40½
45 Challenge....2¼
20 Caledonia....2.15
1935 Con Imperial....1.20@1¼
160 Confidence....12
1335 Exchequer....4¼@4.55
800 Flowery....50@55c
370 Gould & Curry....6⅝
430 Hale & Nor....9¼@9½
740 Justice....3.40@3.35
970 Julia....3.80@3¾
250 Kossuth....10c
345 Lady Bryan....95@90c
205 Lady Wash....1
450 Leviathan....25@30c
850 Mexican....29½@29¼
125 Mackey....2⅞@2.95
50 Mt View....2½
1195 N Bonanza....1@1.05
810 New York....60@55c
180 North Con Vir....7⅞
220 Ophir....20¾@20½
110 Overman....9@9¼
200 Occidental....75c
50 Phil Sheridan....10c
300 Solid Silver....35@30c
1550 Silver Hill....1¼@1.20
410 Savage....9@9¼
200 Sierra Nevada....40½
150 Succor....50@55c
215 Scorpion....1.40@1.30
300 Trojan....10c
105 Utah....13½
120 Union Con....53@53½
850 Ward....95c@1
295 Yellow Jacket....13@13½

AFTERNOON SESSION.

370 Argenta....1.05
100 Albion....25c
200 Belle Isle....40c
375 Bulwer....18@18½
570 Bodie....10
835 Bechtel....1.70@1.30
1725 Booker....50@55c
1235 Belvidere....1.30@1.45
300 Champion....35c
200 C Pacific....2.20@2¼
710 Dudley....65c
100 Day....25c
285 Eureka Con....17@16½
200 Giant & O A....5
200 Goodshaw....50c
25 Hillside....1¼
500 Highbridge....40c
100 Independence....1.55
240 Jackson....7
850 Jupiter....40@35c
120 Leopard....75c
10 Manhattan....2¼
710 McClinton....1@1.10
1120 Mono....3.40@3.35
500 Noonday....1.70@1⅝
550 N Noonday....45c
100 Navajo....25c
500 Oriental....55@60c
50 Paradise....1.80
300 Phenix....1⅜
510 Raymond & Ely....4½@4
410 Real del Monte....6@7
275 Revenue....1.15
80 Red Cloud....1
125 Summit....2¼
450 S Bodie....45@50c
470 S Bulwer....85@90c
630 S Standard....20@15c
100 Star....50c
600 Tuscarora....5c
390 Tioga Con....1.80@1⅞
900 University....40c

Saturday A. M., Apr. 5.

100 Alpha....17¼@17⅜
150 Alta....4.55
200 Andes....30c
200 Albion....24c
280 Best & Belcher...15@14⅞
635 Belcher....5⅝@6
320 Bullion....4.80
70 Benton....3
50 Belmont....15c
250 Belle Isle....40c
65 Bulwer....18@18¼
360 Bechtel....1⅜
440 Bodie....10
1215 Black Hawk...3.60@3.95
210 Booker....70@60c
770 Belvidere....1¾@2
320 Crown Point....4½@4.60
630 California....5½@5¼
640 Chollar....5¼
1100 Con Virginia....5⅝@5⅞
1720 Con Imperial....1.20@1¼
105 Caledonia....2.15@2.20
180 Challenge....2½
450 Champion....35@30c
200 Concordia....35c
600 Caledonia (B H)....2¼
575 C Pacific....2.15@2½
100 Chieftain....10c
530 Dudley....65@60c
300 Day....30c
525 Exchequer....4.30@4
250 Eureka Con....16
200 Endowment....25c
650 Flowery....60@65c
315 Gould & Curry....7@6⅞
220 Grand Prize....3¼
10 Golden Terra....9½
650 Goodshaw....50c
100 H & Norcross....9½
1190 Highbridge....40@45c
200 Hamburg....50@60c
70 Independence....1½
370 Jackson....7½@8
725 Justice....3.15@3
210 Julia....3¾@3.5
450 Jupiter....50c
60 Kentuck....4¾@4
240 L Bryan....80@75c
640 Leviathan....20@25c
150 Lady Wash....70c
80 Leopard....65c
100 Leeds....60c
40 Manhattan....2¼
1430 Mexican....30¼@29
100 Mountain View....2
130 Mackey....2.80@2.8
2035 McClinton....1.10@1.30
610 Mono....3.40@3½
90 M White....6
290 New York....60c
240 N Con Virginia....7¾@8
580 N Bonanza....1¼@1.35
90 Northern Belle....1
450 Noonday....1¾@
100 N Noonday....50c
220 Ophir....20¾@20½
220 Overman....9@9
90 Oriental....60@55c
380 Phil Sheridan....15@10c
320 Potosi....5¼@
100 Paradise....1.60
205 Phenix....2@2¼
920 Raymond & E....4@4
525 Real del Monte....4@
100 Revenue....10c
20 Seg Belcher....20
200 Savage....[illegible]
145 Sierra Nevada....41@40
1450 Silver Hill....1.10@1.20
450 Scorpion....1.40
250 Solid Silver....35c
350 Summit....2.40@2¼
1140 South Bodie....50@55c
860 S Bulwer....90@85c
150 S Stanford....20@30c
300 Trojan....15c
690 Tioga....1
1300 Tuscarora....5c
200 Tiptop....75c
130 Union Con....55@55
45 Utah....13⅞@14
900 University....40c
325 Ward....
200 Wells-Fargo....10c
90 Yellow Jacket...13¾@13

Monday A. M., Apr. 7.

80 Alta....3¾@4.60
40 Alpha....18
50 Andes....35c
480 Belcher....5⅞@5½
230 Benton....3.20@3
1490 Bullion....5@5¼
70 Best & Belcher....15½
305 California....5½@5¼
1695 Con Virginia....5¼
340 Chollar....[illegible]
80 Confidence....12@12
670 Con Imperial....1¼@1.30
410 Crown Point....4.50
46 Challenge....2½
260 Caledonia....2.15
330 Exchequer....4.65@4¼
245 Gould & Curry....6½@6¼
335 Hale & Nor....9⅞@9¾
20 Julia....3.40
405 Justice....3½@3.50
185 Kentuck....5
675 Leviathan....50@45c
80 Lady Wash....75c
700 Lady Bryan....75c
320 Mexican....29@29¼
50 Mackey....2.90
450 New York....65@60c
650 N Bonanza....1.20@1¼
200 North Con Vir....8@7¾
300 Ophir....20¼
150 Overman....9
950 Phil Sheridan....10c
50 Potosi....5@4¾
120 Savage....9¼
100 Silver Hill....1.20@1.15
580 Sierra Nevada....42
235 Scorpion....1.40@1½
800 Solid Silver....35c
200 Trojan....15c
175 Union Con....54¾@54½
50 Utah....14½
175 Ward....1@95c
15 Yellow Jacket...13½@13⅝

AFTERNOON SESSION.

1260 Argenta....1.10@1.20
100 Albion....25c
2500 Belle Isle....35c
270 Belmont....35@25c
1160 Bechtel....1½@1.60
335 Bodie....8½@8¾
100 Bulwer....19½
330 Belvidere....1⅝@1.80
1635 Black Hawk....4½@4.40
630 Booker....75@70c
570 Con Pacific....2¼
100 Chieftain....10c
325 Caledonia (B H)....2¼
110 Champion....40c
200 Day....30c
520 Dudley....65@60c
90 Eureka Con....17
300 Endowment....25c
115 Grand Prize....3.40
100 Gila....25c
820 Goodshaw....50c
250 Giant & O A....5
50 Hussey....15c
100 Hamburg....50c
350 Highbridge....45c
200 Hillside....1¼@1½
780 Independence....1½
30 Jackson....7¾
850 Jupiter....50c
1100 Leopard....60@65c
200 Leeds....55c
300 Manhattan....2.36@2¼
1450 McClinton....1.20@1¼
480 Mono....3@2.90
1100 Noonday....2
250 N Noonday....75c
140 Northern Belle....9⅞
30 Phenix....2.60
150 Paradise....1⅞
480 Raymond & Ely..4.30@4¼
160 Real del Monte....3½
300 Revenue....1
300 Red Cloud....75c
170 Star....50c
1000 Summit....2¼
150 S Bulwer....85c
1300 S Standard....25@20c
950 S Bodie....55c
400 Tuscarora....5c
295 Tioga Con....1.90@1⅞
145 Tiptop....70c
1190 University....40c@1.95

Tuesday A. M., Apr. 8.

140 Alta....4.60@4.70
355 Alpha....19½@19¼
150 Andes....40c
590 Belcher....6¼@6
50 Baltimore Con....50c
500 Bullion....5@5⅛
200 Best & Belcher....16¼@16
180 Benton....3.20
385 California....5½
2675 Con Virginia....5⅞@6
170 Chollar....6¼@6½
420 Crown Point....4.80
125 Confidence....13@13½
2515 Con Imperial....1¼@1.40
350 Caledonia....2.20
975 Challenge....2.65@2.55
700 Exchequer....4.90@5
100 Flowery....65c
490 Gould & Curry....7@7¼
285 H & Norcross....9⅞@10
535 Julia....3⅞
1130 Justice....4@4.05
10 Kentuck....5¼
840 Lady Bryan....75@80c
200 Lady Wash....1.20
200 Leviathan....50c
250 Mexican....29¾@30
150 Mackey....2.90
150 Mt View....1⅞
100 New York....70c
1225 N Bonanza....1¼@1.35
30 Overman....9⅞
375 Ophir....21¼@21½
140 Potosi....4.80@4⅞
850 Phil Sheridan....10c
715 Savage....9⅞@9⅞
870 Silver Hill....1¼@1.30
40 Seg Belcher....24
150 Succor....60c
200 Solid Silver....35c
750 Scorpion....1½
75 Sierra Nevada...43¼@43¾
535 Trojan....20@10c
150 Utah....14½
120 Union Con....55½@56
100 Wells-Fargo....10c
620 Ward....1@1.05
900 Yellow Jacket....13⅞@14

AFTERNOON SESSION.

900 Argenta....1¼@1.30
1050 Albion....20c
190 Bodie....8@8¼
1020 Bechtel....1.60@1.65
700 Belle Isle....40@45c
360 Belmont....35c
600 Booker....60c
295 Bulwer....20½@20¾
106 Belvidere....1.60@1.40
150 Black Hawk....4@4.20
100 Chieftain....10c
1005 Champion....35@40c
120 C Pacific....2.40@2¾
800 Dudley....50@60c
350 Day....30@25c
70 Eureka Con....18
400 Goodshaw....50@45c
400 Grand Prize...3.40@3.35
600 Highbridge....45c
200 Hillside....1¼
550 Independence....1½
200 Ida....45c
570 Jackson....7
900 Jupiter....50c
155 Leopard....65c
100 Leeds....60c
400 Manhattan....2.35@2¼
20 M White....6¾
890 Mono....2.90@2.80
700 McClinton....1.30@1¼
500 May Belle....25c
360 Noonday....2¼@2¼
300 N Noonday....75c@1.05
70 Phenix....3
200 Paradise....1⅞
60 Raymond & Ely....4¾
450 Richer....80@75c
740 Summit....2.10@2.15
200 South Standard....20c
650 S Bodie....40@50c
225 S Bulwer....90@85c
400 Star....40c
125 Silver King....7½@7
250 Tiptop....70c
100 Tuscarora....5c
520 Tioga Con....1.85@1.90
920 University....50@45c

Wed'sday A. M., Apr. 9.

295 Alta....5¼@5¼
100 Andes....40c
1055 Belcher....5⅝@5¾
80 B & Belcher....15⅞@15½
400 Brilliant....30c
455 Benton....3.20@3¼
300 Bullion....5@5⅛
220 Caledonia....2.20@2¼
125 Challenge....2.60@2.70
110 California....5⅜@5⅝
75 Confidence....13¼
375 Con Imperial....1.40
980 Con Virginia....5⅞
100 Chollar....6⅜
410 Crown Point....4.80@4⅞
595 Exchequer....4.90@5
760 Flowery....50@60c
480 Gould & Curry....7½@7¼
310 Hale & Nor....10@10¼
240 Julia....3.85@3.90
825 Justice....4.70@4.65
90 Kentuck....4.60
50 Lady Bryan....80c
950 Leviathan....45@40c
375 Mexican....29⅞@30
630 Mackey....3.15@3.05
100 Mount View....1½
375 N Bonanza....1.35@1.40
20 North Con Vir....8
200 New York....60c
100 Ophir....21½@21¼
245 Overman....9⅞@9½
220 Potosi....4@4.10
250 Phil Sheridan....10c
505 Silver Hill....1.20@1.15
620 Succor....60@55c
555 Savage....9⅞@9½
325 S Nevada....42¼@43
200 Solid Silver....35c
135 Scorpion....1½@1.65
400 Trojan....20c
105 Utah....14⅞@14⅝
176 Union....54½
150 Wells-Fargo....5@10c
270 Ward....1.05
490 Yellow Jacket....14@14½

AFTERNOON SESSION.

1150 Argenta....1¼
1000 Albion....20c
200 Belmont....35@40c
10 Belle Isle....40c
200 Bodie....7½
540 Bulwer....21½@21
600 Belvidere....1½@1.60
990 Bechtel....1½@1.55
1205 Black Hawk....4¼@4½
845 Booker....55@50c
1850 Champion....35@30c
1450 C Pacific....2.60@2.80
50 Chieftain....10c
100 Caledonia (B H)....2¼
330 Dudley....50c
50 Eureka Con....17½
400 Gila....30c
150 Grand Prize....3½
450 Goodshaw....45c
150 Hussey....15c
700 Highbridge....40@35c
300 Hillside....2
400 Independence....1.55
700 Jupiter....50c
20 Jackson....7½
200 Leopard....70c
365 Manhattan....2¼@2.40
900 McClinton....1.30@1¼
925 Mono....2.90@3¼
800 Navajo....25c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Alta S M Co	California	14	1 00	Feb 20	Mar 27	Apr 15	W H Watson	302 Montgomery st
Belcher S M Co	Nevada	17	1 00	Feb 7	Mar 12	April 1	Jno Crockett	203 Bush st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 11	May 3	T E Atkinson	318 Pine st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Leopard M Co	Nevada	10	50	Mar 10	Apr 14	May 5	R H Brown	327 Pine st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Apr 19	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 15	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	Mar 24	Apr 15	J W Pew	310 Pine st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	Mey 13	G C Pratt	309 Montgomery st
Panther M Co	Nevada	11	10	Apr 3	Mey 7	May 28	J W Pew	310 Pine st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Day S M Co	Nevada	3	05	Feb 6	Mar 15	April 8	J W Pew	310 Pine st
Diana G & S M Co	Nevada	3	10	Feb 12	Mar 27	Apr 12	J T McGeoghegan	316 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	12	25	Feb 19	Mar 24	Apr 15	R H Brown	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Colline	227 Montgomery st
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 16	C H Bogart	106 Leidesdorff st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 28	J M Buffington	309 California st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Jupiter M Co	California	2	10	Feb 15	Mar 18	Apr 16	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
New York M Co	Nevada	18	40	Feb 18	Mar 25	Apr 15	D L Thomes	203 Bush st
Northern Light G & S M Co	California	3	10	Jan 23	Apr 10	Apr 28	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Red Hill H & W Co	California	1	05	Feb 24	Mar 31	Apr 17	A B Peul	328 Montgomery st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Summit M Co	California	7	05	Feb 4	Mar 11	May 6	R N Van Brunt	318 Pine st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Brilliant M Co		Wm A M VanBokkelen	309 California	Annual	April 16
Golden Gate Con H M Co	California	J T McGeoghehan	318 Pine st	Special	April 14
Golden Star M Co		J W Morgan	318 Pine st	Annual	April 26
Indian Queen M & M Co	California	Alfred K Durbrow	309 Montgomery st	Annual	April 22
Liguria G & S M Co		A B Cooper	328 Montgomery st	Annual	April 17
Morning Star M Co	Nevada	Jas B Maholm	331 Montgomery st	Annual	April 29
Panther M Co	Nevada	J W Pew	310 Pine st	Annual	April 15
Pinkham M Co		Geo R Spinney	310 Pine st	Annual	April 17
Queen Bee M Co	California	T A White	113 Leidesdorff st	Special	April 15
Silver Prize G & S M Co	Nevada	H W Redington	328 Montgomery st	Special	April 14
Tioga Con M Co	California	W H Lent	309 Montgomery st	Annual	April 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	April 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Mar 20
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

20 Northern Belle....9⅞
400 N Noonday....1¼@1.20
700 Oriental....55c
360 Phenix....3¼
1040 Raymond & Ely...4½@5¼
220 Richer....80@90c
550 Star....40c
50 Summit....2¼
200 S Standard....25@20c
300 S Bodie....55@45c
1200 S Bulwer....85@90c
1700 Tuscarora....5c
595 Tioga Con....2@1.95
25 Tiptop....70c
700 University....50@55c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Apr. 3.

300 Alta....4.80@4.85
200 Alpha....17@17½
150 Andes....40c
140 Best & Belcher...15@15½
125 Bullion....5@5¼
650 Belcher....6⅜@6¼
320 Benton....3.10@3.20
410 Caledonia....2.20@2¼
935 Con Imperial....1.20@1¼
495 California....4.95@5
945 Challenge....2½@2.65
485 Con Virginia....4.95@5
100 Confidence....12⅞@12⅝
175 Crown Point...4.65@4.70
110 Exchequer....4.80
1195 Flowery....60c
455 Gould & Curry....7½
235 Hale & Nor....10¾@10⅝
1245 Justice....3.70@3.85
120 Julia....3.90@3.95
100 Kentuck....4½
750 L Bryan....80@75c
150 Lady Wash....1.10
1650 Leviathan....25@20c
945 Mexican....31@31¼
280 Mackey....2.95@3
500 Margarita....10c
50 Mt View....2½
400 New York....65@60c
745 N Con Virginia....8@8¼
300 N Bonanza....1.10@1.20
250 Ophir....21¾@22
260 Overman....9¼
550 Phil Sheridan....10@15c
80 Sierra Nevada....42@42¼
260 Savage....10⅛@10¼
125 Scorpion....1½
145 Silver Hill....1.40@1.35
100 Succor....55c
1350 Solid Silver....35c
30 Utah....13⅞@14¼
550 Wells-Fargo....10c
275 Ward....1@1.05
575 Yellow Jacket....13¾

AFTERNOON SESSION.

920 Belvidere....90c@1¼
220 Bodie....8
1140 Bulwer....17
345 Black Hawk....3½
270 Bechtel....1½@1.55
900 Belle Isle....40c
550 Booker....50@80c
150 Belmont....40c
600 Caledonia (B H)....2.35
130 C Pacific....2.15@2.20
200 Champion....35c
450 Dudley....65c
600 Esmeralda....1.10@1.30
220 Eureka Con....18
370 Grand Prize....3½@3.55
200 Hussey....20c
600 Highbridge....40@45c
400 Independence...1½@1.60
220 Jackson....7
300 Jupiter....40c
200 Leopard....70@75c
1420 Mono....3½@3.30
330 Manhattan....2¼
550 McClinton....95c@1.10
30 Northern Belle....9½@9⅞
300 Navajo....15c
500 Noonday....1½
700 Oriental....55@60c
100 Phenix....2
100 Raymond & Ely....4¾
200 Real del Monte....3
250 Revenue....1.10
100 Summit....2.20
725 S Bodie....40@35c
300 South Standard....20c
800 S Bulwer....85@90c
460 Tioga Con....1.70@1⅞
2200 Tuscarora....5c
350 University....40@45c

Thursd'y A. M., Apr. 10.

75 Alta....5@4.90
100 Andes....35c
110 Alpha....20
235 Best & Belcher....16¼
1425 Belcher....6@5¾
275 Bullion....5
250 Benton....3½@3.40
100 Brilliant....25c
180 Crown Point....5¼
820 California....5⅝
655 Con Virginia....5⅜@5¼
210 Chollar....6¼
4045 Con Imperial....1.55@1½
95 Confidence....14¼@14
260 Caledonia....2.20@2.15
800 Challenge....3@2⅞
160 Exchequer....5
60 Flowery....60c
340 Gould & Curry....7⅜@7¼
525 Hale & Nor....10¼@10
90 Julia....3.90@3.85
255 Justice....4.15@4.10
25 Kentuck....4⅞
150 Lady Bryan....80c
390 Leviathan....40@45c
170 Mexican....30¾@30½
50 Mountain View....3
330 Mackey....3.15@3.05
300 New York....65c
45 North Con Vir....8
30 N Bonanza....1.40
150 Ophir....23@22¾
10 Overman....9¾
120 Potosi....4.10
80 Savage....10¼@10
205 Seg Belcher....31@30
885 Succor....60c
470 Silver Hill....1.10@1.15
60 Sierra Nevada...42¾@42½
320 Scorpion....1½
300 Solid Silver....35c
1460 Trojan....20@15c
70 Utah....15
140 Union Con....56¼
110 Wells-Fargo....10c
150 Ward....1@1.10
505 Yellow Jacket...15⅝@15¼

AFTERNOON SESSION.

825 Argenta....1.15@1.10
1200 Albion....16c
750 Belle Isle....40c
310 Bodie....7⅞
70 Bulwer....20½
450 Bechtel....1½
1150 Booker....50@55c
670 Belvidere....1.60@1.65
1310 Black Hawk....4½@4¾
50 Concordia....20c
300 Champion....35c
620 C Pacific....2.70@2⅞
100 Chieftain....10c
675 Gila....30c
150 Grand Prize....3½@3.40
550 Goodshaw....40@45c
140 Giant & O A....4⅞
100 Golden Terra....9
100 Hussey....15c
200 Hillside....2
575 Hamburg....50c
400 Highbridge....35@40c
560 Independence....1½@1.55
100 Ida....40c
1050 Jupiter....50c
570 Leopard....1¼
20 Leeds....55c
430 Manhattan....2½@2.40
75 McClinton....1.20@1.30
500 May Belle....25c
70 Mono....3.15@3¼
250 Martin White....6¼
220 Northern Belle....9½@9⅞
100 Navajo....25c
200 Noonday....2.85
450 N Noonday....1.30@1.35
50 Oriental....55c
575 Paradise....1.30@1.40
50 Phenix....3
50 Raymond & Ely....5¼
50 Red Cloud....75c
400 Richer....80@85c
100 Revenue....15c
640 Summit....2.30@2½
200 S Bodie....45c
650 S Standard....25c
530 S Bulwer....85@90c
90 Tuscarora....5c
690 Tioga Con....1.90@2
400 University....55@60c

Pacific Board—Latest Sales.

Wed'sday A. M., Apr. 9.

20 Best & Belcher....15⅞
100 Chollar....6¼@6½
220 California....5.60@5¾
1350 Con Imperial....1.35@1⅜
20 Crown Point....4.70
40 Con Virginia....5⅞@5.85
100 Gould & Curry....7⅜@7
10 Hale & Nor....10
150 Mexican....29¾
90 Ophir....21⅞@21½
130 Savage....9⅞@9½
70 Yellow Jacket....14

AFTERNOON SESSION.

100 Andes....45c
80 Bullion....5
50 Belvidere....1.60
100 Black Hawk....4⅜@4.40
80 Belcher....5⅝@5.70
300 Con Imperial....1.40
100 Crown Point....4⅞
50 Con Virginia....5.80
80 Confidence....14
40 Gould & Curry....7½
575 Justice....4¼@4.30
100 Mackey....3.65
60 Mexican....30@30¼
100 Martin White....6¼
15 Ophir....22
150 Phil Sheridan....10c
200 Solid Silver....30c
30 Savage....9⅞
50 Ward....1.05
40 Yellow Jacket...14½@14⅝

California Board—Latest Sales.

Wed'sday A. M., Apr. 9.

30 Alpha....19½
100 Atlantic....60c
500 Ætna....5c
400 Atlanta....5c
200 Almaden Q....10c
200 Brilliant....25c
50 Belcher....5⅝@5¾
40 Best & Belcher....15⅞
40 California....5⅜
30 Con Virginia....5⅞
100 Con Imperial....1.35
90 Crown Point...4.70@4.85
40 Chollar....6¼@6⅜
85 Caledonia....2.20@2¼
40 Gould & Curry....7¼
30 Hale & Norcross....10¼
50 Julia....3.70@3.90
60 Mexican....29¼@29¾
100 N Scorpion....75c
50 Ophir....21@21¾
400 Phil Sheridan....10c
150 Silver Hill....25@12½c
40 Savage....9¼
30 Sierra Nevada....43
10 Union....55
200 Woodville....30c
100 Wells Fargo....9c
50 Yellow Jacket..13⅝@13⅞

AFTERNOON SESSION.

40 Alpha....20@19⅞
600 Alexander....4½
400 Atlanta....5c
500 Ætna....5c
300 Almaden Q....10c
70 Belcher....5⅝@5¾
30 Boston....1⅜@1.60
20 Benton....3.20
50 Booker....60c
200 Con Imperial....1.35
30 Chollar....6¼
40 Con Virginia....5¾

40 California	5¢	100 New York	60c
50 Coso Con	5c	40 Ophir	22
40 Exchequer	4.90	120 Potosi	4@4.20
200 Enterprise	1	40 Sierra Nevada	42½@42½
40 Gould & Curry	7@8	10 Savage	9½
1105 Goodshaw	42½@46c	40 Silver Hill	1.15@1.10
70 Hale & Nor	10@10½	1200 S Bodie	50@55c
50 Julia	3@3.90	300 Tiger	1.20@1.40
70 Justice	4@4.20	50 Union Con	54½@54½
30 Mexican	29½	375 Wales	11@11
100 North Carson	5c	100 Ward	1
100 Newark	25c	30 Yellow Jacket	44½

The Mining Share Market.

Though much of the same dull and hysterical feeling which has characterized the last few weeks still remains in the share market, there has been, during the present week, a firmer, steadier tendency of things—sufficient, at least, to form a contrast to the weak, insipid actions we have become accustomed to. The Comstock has remained stagnant, and, with few exceptions, met with limited sales. There was a brisk traffic in the new Bodie mines, presenting a remarkable contrast to the above. Indeed, these mines formed *the* feature of the week. The cause of this interest is the late ore discovery in the Mono-Bodie crosscut. In these, as in all the others, the advances were not so astonishingly large, but the amount of business transacted was inversely heavy. Real Del Monte was especially a favorite for some time. Early in the week there was a slight squabble for Justice, induced by the report that Schultz and his friends were seeking to gain control of the election to be held in May. Savage and Hale & Norcross also showed improvement; and, taking all in all, the quiet condition, the firmer tone, and the increased sales, there is settled feeling in the market that a steady forward movement is in contemplation.

News in Brief.

TRAVEL to Yosemite has set in.

GARABALDI has arrived at Rome.

AN earthquake lately shook up Cadiz.

THE rinderpest is prevalent in Bohemia.

VIGILANTS are active at Davis City, Ia.

PAPER napkins are increasing in demand.

ORANGES are cheaper than apples in Astoria.

IN March, the public debt increased $892,724.

THE Army Appropriation bill has passed the House.

NUMBER of silver dollars coined to date, 21,661,274.

THE Albanians will forcibly resist annexation to Greece.

THE Skagit (W. T.) gold mines are attracting attention.

THERE are 170 convicts in the Oregon penitentiary.

THE Mormon Conference met at Salt Lake, Sunday.

THE Workingmen's Free Library has 865 volumes.

CHINESE labor is becoming a drug in Los Angeles.

STONY POINT boasts of a healthy four-legged chicken.

THE paraffine beds of San Pete, Utah, are being opened.

ANOTHER British victory is reported from Lahore, India.

THE labor market promises to be unusually large this season.

HAY harvest will soon commence in Santa Cruz county.

THERE are 195,897 persons buried in Greenwood cemetery.

THIRTY-FOUR marriage licenses were issued in the city last week.

MACKEREL are being caught in large quantities near Monterey.

WHITE laborers have been substituted for Chinese on the Oroville railroad.

IN the Oliver-Cameron case the jury rendered a verdict for the defendant.

THE estimated cost of the Mexican International building is $800,000.

THE Egyptians have again defeated the Arabs, killing over 2,000 men.

THE telegraph wires were down between Ogden and Cheyenne on Sunday.

COYOTES are rendering the sheep business unprofitable in Colusa county.

THE people of American Fork, Utah, are destroying the grasshoppers with fire.

THE beach mines along the coast of Coos county, Oregon, are pay handsomely.

YOUNTVILLE, Napa county, experienced a slight shock of earthquake on Monday.

THE drilling of Bulgarians in Eastern Roumelia continues—70,000 men now being armed.

VANDERBILT is buying steel rails in England, paying an advance over American prices.

THE trial of Olive, the millionaire, and his two associates, who burned two men at the stake in Custer county, Neb., is now in progress.

AT a prison at Charkoff, Russia, 200 of the 500 prisoners have died within four months.

INDIANS are raiding the Yellowstone valley, killing the whites and capturing horses and cattle.

THE Russian police system is to be reconstructed as a concession to prevalent discontent.

ONE-QUARTER of the children in the public schools of Virginia City are down with the measles.

ANOTHER colonization scheme is organizing in New York, under Catholic guidance and capital.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PLYMOUTH NOTES.—Cor. *Ledger*, April 5: The Hercules mine is making slow headway in sinking. One day last week a stream of water burst through the hanging wall, filling the shaft with water to the depth of 10 or 15 ft. It was soon taken out. Water, however, is flowing too fast to admit of rapid progress in sinking. Reports are afloat that the New London claim has been sold, and that the purchasers intend to start it up at once. There is a fair sized body of ore in sight. Considerable work was done on it years ago, and all the rock taken out paid well. Chas. Green & Co. took up the north extension of this claim last fall, but no work has been done on it yet. The contract for sinking in the Junior mine is finished.

OTHER ITEMS.—*Dispatch*, April 5: The joint shaft of the East Keystone and Niagara mines is now down about 60 ft, at which depth they have a two-ft ledge of good looking rock, showing some free gold. Mr. Parks, the superintendent of the Talisman mine, has let a contract to some Italians for sinking the shaft 100 ft deeper. The stockholders appear to have more confidence in the mine now than ever. Sutter is feeling "blue," owing to the probability that the Amador mill will be shut down for about six months during the coming summer, until the new shaft can be finished. Mr. Mello, of Butte City, has erected a little two-stamp quartz mill in the canyon between that place and the river, for the purpose of crushing rock taken from his claim near the same place.

INYO.

MONOCK.—*Independent*, Mar. 29: Distance made in tunnel, 1000 level, is 34 ft, the total length of tunnel being 1,308 ft. The ground for greater part of week has not broken very well, but is now very soft in face. The drift lately broke into manganese and clayey matter, which, taken with indications for the past two or three days, would lead us to believe that we have got through the limestone belt lying next to Confidence ore ground. Hope shortly to have some developments at face of tunnel. The shaft has been sunk 10 ft, and is now down 335 ft. The points where chlorides are at work—1000 level—are looking very promising. It has the appearance of opening out into an extensive body of ore.

THE EMIGRANT.—The prospects of the Emigrant are decidedly encouraging. Five stamps are pounding away continuously, and bullion shipments being made regularly. There is enough ore now uncovered to keep one battery running steadily for at least a year to come, by which time, if not before, a new shaft and other prospecting operations will be complete. The Emigrant is a paying property as it is, and owes much of its success to the really efficient management of Supt. Taylor. A concentrator is to be put to work at once upon the tailings at the old mill site; it is estimated that at least $20,000 can thus be got out of these tailings; the concentration will bring their value up to about $400 per ton, thereby effecting a material saving in hauling and subsequent pauwork.

MONO.

THE STANDARD.—*Mono-Alpine Chronicle*, April 5: The event of the past week is the re-discovery of the Burgess ledge, which twisted out of the drift north. It had pitched west. It seemed to run out entirely, but in a distance of 30 ft, came in more heavily freighted with gold than ever, but dipping to the east. There is no change in the Bruce, Gildea, or the several other faces on ledges outside of the old main Standard lode. The new air compressor has been fairly tested, and the work of driving the patent drills begun in earnest. One of these drills will be put to work in the south drifts and crosscuts of the Bulwer mine, connecting with the main shaft of the Standard ground. It has been finally decided to open a new level in the Standard, as well as continue sinking the shaft, which is now down 780 ft vertical. A station will be cut out at the 700 level and crosscutting, both east and west, begun at once. A 700 level in the Standard is going to give the "mother vein" theory a fairer test than all other works put together.

BULWER.—The crushing process at the Bodie mill ought to be satisfactory to the stockholders. Already $63,000 and upwards have been shipped, and there were over 700 pounds of amalgam awaiting the retort yesterday, and valued at $22,000 more, and not half the ore-pile has been put through yet. The result of that crushing of 1,000 tons promises to be nearly a quarter of a million dollars. The shutting off of ore extraction at the Bodie mine is not as much felt as expected.

BELVIDERE.—The upraise on the Great Western ledge, on the new development, continues in ore of same character. The excavation above the drift is about 10 ft in length and 12 ft in hight.

NOONDAY.—The drifts either way from the shaft are about 45 ft in length; stoping is still going on; ore holds out in size and quality. As soon as the Bechtel shipment is crushed, the Syndicate mill will commence on Noonday ore.

BLACKHAWK.—The west crosscut, 320 level, is in over 40 ft, and is being rapidly extended. Ore body in Warren lode, 220 level, is improving on south drift and holding its own north.

BOORER.—*Standard*, April 5: A few days ago Superintendent Ellsworth, of the Booker, in running a drift north from his shaft on his ledge, drifted directly into the Spaulding shaft, which is being sunk on an incline on its ledge, followed from the surface. The Spaulding people claim that the country is all interlaced with stratums of quartz, and that Mr. Ellsworth has followed one of these stratums off his main vein, and connected with their ledge. Accordingly, Mr. Harry A. Gould, foreman of the Spaulding, hulkheaded the drift and shut the Booker people out. Mr. Ellsworth took the offensive. His men broke down the hulkhead and practically took possession of the Spaulding mine by force. Mr. Gould says that the Booker people were armed. They threw a track across the shaft, and, it is said, are continuing the work of drifting north of the Spaulding incline. The latter mine has been shut down.

NEVADA.

KENTON.—*Transcript*, April 6: This mine is showing considerable improvement. Have seen considerable free gold in the ore the past two days. Will push the new winze ahead as fast as possible and open from the lower tunnel. The mill is running steadily day and night.

GOOSEN HILL.—Mr. John Black is opening up the Ooshen Hill gravel lead, three-quarters of a mile west of Rough & Ready. He has been at work there about three months, with four or five men, has put in over 3,000 ft of pipe, and will have sufficient water to run until the middle or latter part of June. The ground was prospected some years ago, and favorable indications were found.

NORTH BLOOMFIELD NOTES.—The Malakoff mining company have a full force—some 60 or 70 white men, and about 40 Chinese—at work, and the developments are as satisfactory as usual. Brockmyer & Haner, whose claim is just opposite the Malakoff Co.'s office, on Virgin Valley ravine, are working five or six hands, and meeting with good success. They rely entirely upon free water, and will doubtless have sufficient this season to make a run of from three to four months.

CONDENSED NEWS.—At Moore's Flat the Blue Banks claim is about ready to begin washing. The Boston is running full blast, working 30 men and paying $3 per day—the attempt to cut down the wages having been abandoned. The Chinese claims are also running full force. The Little York mining company is reported as having shut down, in consequence of the injunction granted the farmers by Judge Keyser. The Thomas mine, formerly the New England, is turning out considerable good ore which is said to be paying handsomely. The mine known as the Black Lead, near the Rocky Bar, is looking splendid. A small crushing last week turned out a little over $75 per ton. Assays of the Wyoming ore run as high as $700 per ton; free gold, $300; silver, $17; sulphurets, $389. The general average of the great bulk of ore is $17 per ton free gold, and from $98 to $108 concentrated sulphurets. The Badger Flat claim, in Pleasant valley, has been washing since last October. The owners expect to commence cleaning up this week. The machinery being put up on the Iron Clad mine, near Rough & Ready, is from the Montana mine, at Colfax. About 60 tons of ore per week is extracted from the Deadwood mine by the lessees. There are some 350 tons of fine looking ore on the dump. The mill is running night and day.

SAN BERNARDINO.

IVANPAH ITEMS.—Cor. *Index*, April 4: In the well known Alley mine the laws of geology are set at defiance; there is no regular stratification, and a mining man educated in Europe would say on examination, that there was no mine or the semblance of a mine there. Still the mine is yielding as rich ore as any in the State. It occurs in pockets or kidneys, and is found in such quantities as are fully satisfactory to the owners. The Alley mine is located on the west side of the mountain range immediately adjoining the well-known Alaska hill, on which the Lizzie Bullock, Beatrice, Monitor and other well-known mines are located. The Lizzie Bullock mine is owned and worked by Mr. J. A. Bidwell, who is also owner of the only mill now at work in the district. The well-known mine, the Stonewall, located on the hill to the east of the Alley, and is looking well. Mr. Harris has sunk an incline 50 ft deep from the third level. The incline shows good ore on both sides for the entire depth. He is running a tunnel to cut the bottom of the incline, and has about 20 ft to run before cutting the ledge; he will then commence stoping out the rich ore.

SHASTA.

WHISKY TOWN.—Cor. *Independent*, April 3: The mine of Strode & Co., (old Peckham mine) is in good condition. Since striking the ledge they have run about 200 ft on it. The ledge is about two ft wide at the end of the tunnel. The rock is very hard but it prospects well. A five-stamp mill is going up as rapidly as possible, and will be in working order about the last of next week. They have about 300 tons of quartz on hand. Work in the shaft of the extension, owned by Warfield, Blair & Co., had to be suspended on account of water caused by the recent rains. A tunnel is now being run to tap the shaft. They have an abundance of water to run the arastra. The rock is yielding about $30 per ton.

SIERRA.

PITTSBURG HILL.—Downieville *Messenger*, Mar. 22: The promising gravel mine, in which George and Johnny Sharp, of Green & Co.'s stage line are interested, located near Camptonville, Yuba county, is being rapidly developed with encouraging indications of a rich gravel bed. Four hundred ft of tunnel have been run, when the boys raised for 60 ft, tapping pay.

INDIAN HILL.—Fresse & Anderson, at this mining locality, are washing their dirt. Tom Jackson has several men in his hydraulic claim, with full head of water.

PHIPPS AND MINNESOTA.—Sam. Irean, from Minnesota, reports 18 inches of snow there, and miners waiting for spring to open. Alf. Bixby is constructing a ditch to bring water to his mine, to sluice of the croppings of his quartz ledge. Ike Boles is developing his lods. Sam. Irelan continues driving his tunnel ahead, which is now in 550 ft. Ledge is three ft thick.

TRINITY.

AT WORK.—*Journal*, April 5: The Dixion Bar company, having everything in complete working order, commenced washing gravel on Monday last, and the hydraulic works splendidly. The company's prospects are said to be encouraging and it is hoped their mine will yield labu ously. It is an enterprise in which considerable cash capital has been invested, and deserves unhounded success.

NEVADA.

WASHOE DISTRICT.

The non-receipt of our usual Washoe letter compels us to copy from the Gold Hill *News*, of the 8th inst., the following recent information in regard to the Comstock mines:

CON. VIRGINIA.—Have extracted 1,482 tons of ore during the past week. The repairs to shaft will be completed on Monday next, at which time they will start the joint west crosscut from the 850 station. This crosscut will be continued with all possible speed to the west wall, and will open up and thoroughly prospect the unexplored ground to the west of the shaft. The C & C shaft has been sunk 15 ft, and is now 105 ft below the 2150 level. The material in the bottom is somewhat softer. They will reach the 2350 level next Monday, but before opening the station will sink the shaft 40 ft below for a sump. The necessary surveys have been made for the south lateral drift to connect with the Sutro tunnel, and they only wait for a certified copy of the Sutro compromise before commencing work.

CALIFORNIA.—Have extracted 2,170 tons of ore during the past week. West crosscut No. 1 has been discontinued, the face showing strong indications of water. They will have to explore with a drill, and not run the risk of being driven out by water.

OPHIR.—The main incline has been sunk and timbered during the past week 12 ft; total depth on the stope, 16f ft below the 2200 level. The material passed through is still a vein formation, showing some streaks of quartz. The ore stopes show no material change since last report.

TROJAN.—Northeast drift, third station, has been advanced and timbered 39 ft; total distance passed upraise No. 4, 229 ft; material passed through, very loose quartz and porphyry; quartz giving low assays. West drift from northeast drift has been extended 25 ft through vein porphyry; total length, 40 ft. Second station, north drift, has been extended and timbered 55 ft, passing through a mixture of quartz and porphyry; quartz giving low assays.

EXCHEQUER.—Work was resumed last Wednesday in the north drift on the 2400 level. Since which time the drift has been advanced 18 ft, making total length of the same 316 ft. The material encountered during the past week has been porphyry and quartz of a very promising nature, and which continues to improve as they advance north.

CHOLLAR.—At the Chollar-Norcross-Savage shaft during the past week they have put up smokestacks for boilers to air compressor. Have made steam connection between compressor and boilers, and air connection between compressor and receiver. They have pumped daily about 105,000 gallons of water into the Sutro tunnel.

SILVER HILL.—During the past week the main incline has been sunk and timbered 16 ft. The east crosscut, 1100 level, has been run 36 ft, and drift south from small shaft 46 ft, leaving the distance to Silver Hill, north line, 16 ft. They intend to stop the work underground tomorrow to overhaul the incline engine and put on the new rope for the incline.

OVERMAN.—Since last report the winze has been sunk 12 ft, and north lateral drift extended 36 ft. The ground in the winze is working a little better; no other change. At the new shaft they struck a very strong flow of water on March 30th, and have sunk but five ft this week, but the water is decreasing and they hope to be able to make better progress.

JULIA.—The water in the incline has been reduced to close proximity to the 2400 level. Pumps have commenced drawing from the long south drift, also from east and west crosscuts. Winze sinking from 1800 level has attained a depth of 26 ft and is substantially timbered. Flow of water is slight and does not retard progress of sinking.

UNION CON.—On 1600 level the joint Mexican winze has been sunk and timbered 10 ft, making total depth on slope of 335 ft. The flow of water from east drift continues about two inches. A chamber excavated and the upraise started to connect with the joint Mexican winze being sunk from 1600 level; material passed through is a favorable looking vein porphyry showing some water in face. Main north drift extended 38 ft.

UTAH.—Our main incline has been sunk and timbered 24 ft the past week. The formation remains the same, also the flow of water. The new V-bob has been delivered and is now being put up on the surface to test before putting in place. We are now engaged in putting in a partition in the incline below the 1350 level to cause a current of air to flow to the bottom. All of our machinery is working well.

CON. IMPERIAL.—For the week ending to-day we have made the following progress: The south drift on our 2600 level has been advanced 29 ft; making total length of same to date, 157 ft. The face of this drift is in quartz, clay and porphyry; no water to impede the progress of our work. The north drift has been advanced 15 ft, making total length of same to date, 130 ft. Everything is running all right, and we shall in future be able to make more rapid headway in advancing work in the mine.

MEXICAN.—On our 2100 level the joint Ophir upraise is now up 94 ft. On our 2000 level the joint Union Con. west crosscut has been extended 10 ft; material passed through, favorable looking vein porphyry, showing some water; requires timbering. On our 1000 level the joint Union Con. winze has been sunk and timbered 19 ft; total depth, 365 ft on the slope below that level.

SAVAGE.—We are still delayed from shutting down the pump in the Hale & Norcross. Our retimbering in the incline is making good progress, water being below the 2000 level.

BELCHER.—The main incline has reached a depth of 37 ft below the 2500 level, having been sunk 24 ft during the past week. The crosscut on the 2360 level is in 54 ft. There is nothing new in any part of the mine.

ALPHA.—Nothing new at the mine. We have about completed the work of repairing and enlarging the station on 2135 level. Have not yet resumed work in joint winze. Everything is moving along as usual.

BELMONT DISTRICT.

BELMONT.—*Courier*, Mar. 20: The mine is looking well. Have advanced the south raise 20 ft during the past week in a good, strong vein of quartz, averaging three and one-half ft thick, with from 10 to 12 inches of same pay ore. In the 300 level drift running north the ground is very hard, and they have advanced same only seven ft. The stopes between 200 and 300 levels are yielding the usual amount of ore, and the pocket of ore found going down under the 200 level is getting larger every day. Number of tons extracted for the week, 10; average assay, $96.

HIGHBRIDGE.—Work in the mine has been carried forward with good progress, the ore extracted being unusually rich. The following work has been done in the prospecting drifts, showing no material change: Sixth level, 25 ft south and 32 ft north; seventh level, 23 ft north; total length of this level, 105 ft. The mill will resums reducing Highbridge ore by April 1st.

EUREKA DISTRICT.

THE PHŒNIX.—*Sentinel*, April 5: A marked improvement has taken place in the Phœnix mine within the last few days. The ledge has been cut in the drift from the 500 level, and looks most encouraging for a magnificent development. Sufficient work has not yet been done to accomplish anything beyond ascertaining the mere fact that there are several ft of good ore in sight. The ore body has steadily improved, day after day, since it was encountered. The average distance between the quartzite and shale in the Phœnix is about 75 ft. It is thus seen there is plenty of room for bonanzas of good size. The ore broken down thus far will lies in the drifts. The dump was not in readiness to receive it. This will be finished to-day, when the work of hoisting ore will be commenced immediately.

THE HAMBURG.—There is no special change to note in the stopes above the intermediate drift. The vein of ore is small, but of good quality. During the week the crosscut on the 450 level was advanced 14 ft, being a total of 23 ft, with the face in clay and iron. In the 000 level the west crosscut was advanced 16 ft, being a total of 218 ft, with the face in soft, broken limestone. The south drift from the west crosscut has been advanced 10 ft, being a total of 144 ft, showing a considerable amount of iron, with a number of small seams of good ore through it. In the 700 level the drift is now in 32 ft, through vein matter, showing bunches of iron.

TYBO CON.—The Tybo Con. is again in position to pay all claims against the company. The payment of local accounts was to have commenced yesterday. The mine and furnace have continued in operation right along since the financial troubles came up. It is thought the profits of the last month's run will realize some $40,000 or $50,000.

PARADISE DISTRICT.

GOOD HOPE NOTES.—*Silver State*, April 4: The shaft on the Snyder mine, owned by Waye & Co., has been sunk about 40 ft, and the ore encountered thus far is of a high grade. The Aurora mine is the deepest in the camp, and probably one of the best. The owners have sunk an incline shaft 140 ft, and have discovered some fine ruby and wire silver ore. The ledge is from two to four ft thick, well defined, and will average $100 per ton. It is owned by Winters & Co. The Silver Brick, owned by L. E. Atchison and others, is one of the most promising claims in the district. A north and south drift was started at the 65 level, and some ruby ore, assaying well, was found. On the Buckeye, a new claim, but little work has been done. The ledge was stripped on the surface for a distance of 60 ft, and the ore found was very rich. At a depth of 18 ft the ledge is three ft thick and well defined. This claim is owned by A. J. Dallas & Co. The You and I, the Atlantic Cable, and the Page & Kelley are good looking claims, upon each of which considerable work has been done, and from each of which ore of an excellent quality has been taken.

ARIZONA.

TOMBSTONE.—Cor. *Citizen*, Mar. 23: The Lucky Cuss is opening up in the tunnel wonderfully rich. The Old Guard has been worked on, and the Lucky Cuss ledge has been struck in this claim and the present shaft is all in rich ore, no walls being yet visible. Work has been suspended on the Merrimac for a few days. The reason is that the prospecting shaft has been sunk over 100 ft, and the owners are now satisfied that they have a mine and are going to sink a permanent working shaft and carry on work again in real earnest. Work was commenced on the Emerald yesterday. This claim is situated immediately south of the Grand Dipper. Work has been done on the Revenue mine, and some splendid ore set the mouth of the shaft. This claim is situated on the Lucky Cuss lead.

OLDER ITEMS.—*Silver Belt*, Mar. 23: Messrs. Allen & Skinner have been working the Despreciado mine and have obtained very good results. The ledge is 10 ft in width and assays from $30 to $150 per ton. Other work at various points on the claim shows good ore. Work is still progressing in the tunnel running for the Big Indian ledge, which is now in 80 ft. There is good ore in sight in the Oeueral Allen mine, and can be taken out at any time. The Fi Capitan mine is yielding ore worth from $300 to $400 per ton. A shipment is to be made to the Miami mill. Four men are at work. The Metamora shaft is over 100 ft deep, over six ft having been made last week. The quartz is still of a promising quality. Jack Eatoo, Whelan, Leuther & Co. have found good ore on the extention of the Barnes lode, at Pinto creek.

COLORADO.

SILVER CREEK.—*Miner*, April 5: Cavanaugh, Nash & Co. have leased 100 ft of ground near the breast of the O Connel tunnel. This is the lowest drift on the mine, and is 250 ft in length. A short distance back from the breast, where the lessees are commencing to stope, there is a vein of ore from two to ten inches in width. All the classes of the ore average nearly 400 ounces, and some of the first class run up to 900 ounces. The ore consists of galena carrying copper pyrites and gray copper, besides which there is some decomposed ore, though this stope is about 200 ft from the surface. The breast of the drift carries from two to three inches of ore, more or less decomposed, which assays from 208 to 926 ounces of silve

(Continued on page 244.)

A New Process for Treating Pyrites and Copper Sulphurets.

English technical journals seem to attach much importance to a process brought forward hy John Holloway, in a recent lecture before the Society of Arts. The idea, which has been broached repeatedly, though it has never undergone so complete a practical test, is borrowed from the Bessemer process. Air is blown into the sulphides previously melted in a cupola, to eliminate as much as possible the sulphur, thus concentrating the copper, by ons operation, in a rich regulus, instead of carrying it through numerous calcinations and fusions. The experiments made prove that the reactions in question take place, and on theoretical grounds no fault can be found with the process, but it is hard to see how it can be practically carried out on a large scale in an economical manner. The Bessemer converter, after trial by Mr. Holloway, has been abandoned by him as an unsuitable apparatus for this process. The best form of furnace for working the process cannot at present he decided upon, hut it is probable that eventually it will be a modification of the ordinary blast furnace, fitted with a tuyere hearth. The theory of smelting sulphides with a blast furnace is briefly as follows: The operation is started by putting the tuyere hearth in place and throwing hot coke at the top of the furnace; the blast is then turned on, and when the coke hecomes incandescent the working charge of sulphides and fluxes is introduced. As soon as a layer of molten sulphide is formed over the tuyeres the blast is increased, as also the burden of the furnace. The charge above the fusion zone becomes heated as it descends, losing much sulpher by volatilization as it melts, and also reducing the temperature of the gases as they pass upward. The sublimed oxides, eulphides and sulphur are collected in wide chamhers, with which the side flue is connected. On the hearth, where the air is forced in, the oxygen acts upon the sulphides of iron and zinc, and, as long as a constant supply of these substances is provided, nothing else is appreciably oxidized. The slag is withdrawn from a taphole near the top of the hearth, and the furnace is kept in action as long as the tuyere hearth lasts. The heat of the gases could be used for raising the temperature of the blast, or for producing the steam required to work the blowing engines. The produce of six tons of material would be tapped every half-hour, so that in seven days' continuous working 1000 tons of pyrites bearing sulphides would be treated. The sulphurous acid could be utilized in several ways, and Mr. Holloway acknowledges his indebtedness to Mr. A. H. Allen for the suggestion of a method by whicb large quantities of liquid, auhydrous, sulphurous acid could be converted into sulphuric acid, free from arsenic.

Leadville.

This infant city of the past year, with its closely huilt streets, its bustle of trade, its throng of teams that fill and hlock the way, and its surging masses of humanity that move in ceaseless currents from daylight until the midnight hour, is one of the marvels of the age. The site is favorahle—a smooth plateau, sloping gently to the west, rounding off into California gulch on the south, and rising to a slight ridge on the north. When the town began, the plat was covered with pine trees, hut nearly all have fallen, and each day diminishes the few that ought to be carefully preserved. Fortunately, thick forests surrounded it on all eides, and most of the timber is green, furnishing excellent huilding material at the lowest possihle cost. Building is going forward faster now than ever before, and the town spreads visibly day hy day. Along all the roads leading out north and east, strings of foundations, half built or completed cabins stretch continuously for a distance varying from half a mile to two miles. On the other sides they do not reach so far. There are hundreds, perhaps thousands, of these squatter claims, and it is nothing unusual to hear of their sale for $50, $100 or $200 each, when the improvement is nothing more than four logs, poles or slahs.

The altitude is about 10,400 feet ahove the sea, and the outlook is grand and magnificent. To the east, beyond the swelling green of the pine forests, are the shining peaks of the Park rango. Northward are lofty summits that close in the head of the Arkansas. Westward across the wide level valley are those stupendous masses, Massive mountain, Mount Elhert, La Plata mountain, and all the magnificent Sawatch range, here the mother mountains. Southward the view is down the valley of the river—a vanishing vista, shut in hy mountain walls.

Ths characteristics are thoss of any prosperous mining camp, but on a marvelous scale. There is an air of psrmanence not common to such, hut otherwise the history of its growth has hesn a hundred times repeated in California, Nevada and the Rocky Mountain States and Territories. Life is intensified. Everyhody who has anything to do is on the jump. The rasp of the saw aud tattoo of the hammer are heard from daylight to dark seven days in the week. Business occupies the same time and reaches far into the night as well. You must elbow and push your way thrcugh the crowds that fill the sidewalks aud wait for an opening in the teams and vehicles that throng the streets to cross from one side to another. Rents are fabulous. Real estate has advanced 1,000% in three or four months. Such is Leadville at a glance.—*Denver News.*

Lime for Adobe and Gypsum for Alkali.

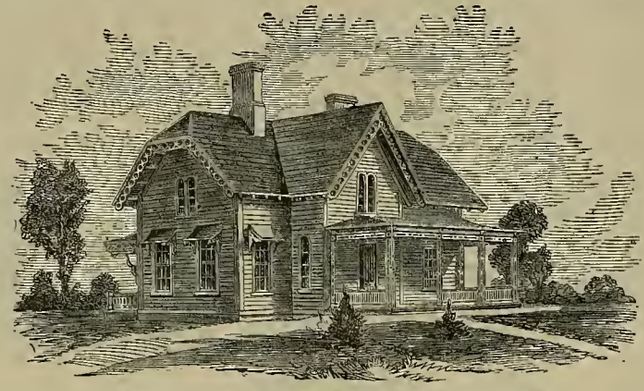
We have been interested in reading in the *American Journal of Science* a paper by Prof. E. W. Hilgard on the subject "Flocculation of Particles and its Physical and Technical Bearings." The paper is intended for the perusal of those who are interested in soil investigation from the scientific side, and is clad in technical language. We shall present in simpler form some of the conclusions arrived at by the writer and the reasons therefor.

The Professor speaks concerning two kinds of refractory soils; one strong clay or adobe, the other alkali; and the "flocculation of particles alluded to is the formation of fine particles which form these soils into floccules or small bunches. It will not he necessary for us to follow ths writer in his close and convincing argument as to the ways in which these floccules are formed, but it will suffice to show that upon their formation depends the tillability of the soils mentioned. On the one hand we have the fine single atoms of a clayey soil forced close together by the plow and "tamped" or "puddled," as it were, so that it is impossible to wholly break them down, and the only result of thorough plowing and harrowing is in reducing the size of the lumps but not destroying their cemented character. Ou the other hand we have the particles of the eoil first formed into floccules, so that the effect of tools is to sunder them and to give us a condition of fine tilth. The whole question of tillability in these soils seems then to restupon making the particlee into floccules, because if floccular they will not cement into lumps nor run together in a hard crust, as is their disposition if the particles are all free to act singly when they come under the plow or wben they are beaten by heavy rains.

This much premised .we may now quote a paragraph concerning the use of lime in rendering clay floccular in its structures. The Professor writes: "Let clay or clay soil be worked into a plastic paste with water and then dried: the result will be a mass of almost stony hardness. Add to the same paste about one-half of one per cent. of caustic lime, which substance (as shown hy Schlœsing and myself) possesses in an eminent degree the property of coagulating clay into floccules. The diminution of plasticity will he ohvious at once, even in a wet condition, and upon drying, the mass will fall into a pile of crumbs upon mere touch, or dropping it on the floor. This is a convincing illustration of the effect of liming upon clay soils in rendering them 'warmer' and more readily tilled. This agrees with the experience of farmers that the 'lightening' effect of a liming continues for years to he manifest and is never entirely lost." The deduction from tests made with the proper apparatus is that the action of lime is to cause the particles of the soil to assume the form of compound crumhs which fall apart when dry, because of the greater distance between them than between the particles when they are all free to run together when puddled hy heavy rains. It is because lime has this effect upon the particles of clay soil that its use in practice has been found very satisfactory.

Another instance of the beneficial effects of flocculation or crumhing, is seen in the effect of gypsum or land plaster upon alkali soils, which are rendered both infertile and untillable hy the preseuce of alkaline carbonates. Prof. Hilgard cites a case of alkali soil from near Stockton, of which some mention was made by him in an article for the PRESS last year. He made two analyses of adjacent soils, one being from a fertile ridge, another from an alkali spot lying ahout 18 inches lower than the ridge. The alkali soil had been plowed, cross-plowed, rolled and harrowed, until the harrow produced no farther effect; and the result was a seed-bed of soil clods ranging from the size of a pea to that of a billiard ball, but no tilth. At the same time portions of the ridge soil, cultivated in the same way, were reduced to an ashy condition of tilth. Examination showed that the two soils were almost alike in mechanical composition, but chemical analysis showed the alkaline carbonates in the intractable spots, and the presence of these prevented the floccular condition which we bave described. The application of gypsum, by decomposing these alkaline carbonates, enables the particles to flocculate or form crumbs, and thus become tillable. This was apparent at once in the experimental quantity of the soil used in the laboratory, but another season will be required to show the effect in ths field. Another effect of the plaster is in neutralizing the corrosive effect of the alkali upon plant growth, as has already been shown practically and on a considerable scale by the use of plaster on ths alkali soils in Los Angeles county.

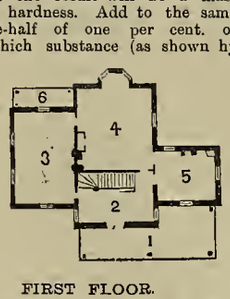
These are some of the points which Prof. Hilgard has placed before the scientific world concerning his investigation of our soil problems, and we doubt not we shall hear farther from him in the *Press* concerning the practical bearings of his studies.—*Pacific Rural Press.*



DESIGN FOR A MODEST FRAME COTTAGE.

A Cheap Frame Cottage.

We give on this page a design for a cheap frame cottage, which would make a modest pretty home for a small family. It is planned by Isaac H. Hobbs & Son, of Philadelphia, the intention being to secure good large rooms with no waste space and without expensive features in construction. In tbis, we think the architects have succeeded admirably. From the porcb one enters a hall 10x16 feet, with a window at each end, which would give as light and airy hall as one could wish. This is a desirable feature which is too often neglected in small houses. As will be seen by the dimensions which we shall give, the roome are all of generous size and well lighted. The projecting roof will help to cool the upper rooms, a fine feature in our warmer regions. Train some handsome climbing vines or roses over the porch and diversify the foreground more with handsome shrubs and flower heds, and one would have as cozy a home as could be longed for.



FIRST FLOOR.

SECOND FLOOR.

In the floor plans, No. 1, is the porch; No. 2, entrance hall, 10x16 feet; No. 3, living room, 14x20 feet; No. 4, dining room, 16x18 feet; No. 5, kitchen, 12x14 feet; No, 6, rear porch from which entrance can be had to the living room from the outside. It will be noticed that the house has no parlor. This is according to our "hobby." Put your best things in the living room and enjoy them.

TUNNELING THE DETROIT RIVER.—Mr. Vanderbilt is going actively at work to carry out the important transit improvement of tunneling the river at Detroit. Information has been received at that city to the effect that Mr. Vanderbilt has awarded the contract, and that work is to be begun the first week in April. The price is stated to he $1,500,000. The tunnel will extend from Stony island to Anderson, Ont., a distance of 3,700 feet, with douhle arches for a douhle track, 18 feet high and 15 feet wide.

THE ENGINEER.

Some Features of Ancient Engineering.

The following is an abstract of a paper lately read by Mr. George Burnham, Jr., before ths Engineers' Club of Philadelphia: Modern research has developed the fact that nearly all the materials (in a very wide sense of the word) of modern civilization originated in antiquity, the peculiar province of our time being to ring the changes of variety upon these elements and give them an immense diffusion.

The textile fahrics of wool, cotton, flax and silk were known to ths Egyptians of three or four thousand years ago, but the cotton-gin, the power-loom and thc steam engins have greatly increased their variety and put them into ths hands of everyone. The same thing is true of the engineering art, for, if we except iron framing, tbe ancients originated nearly all the typical forms we now employ. They wers acquainted with the constructive uses of wood, carried stone construction to a point that we have uever since reached, and probably never shall; their brickwork dates from the very earliest timies, and they constructed canals and aqueducts for irrigation, water supply and inland navigation, as well as elaborate drainage systems, long before their civilization culminated.

The Chaldean structures, dating from 2200 to 1500 B. C., were built of emall sun-dried bricks, laid in bitumen, and faced with kiln-dried bricks, stamped with the name of the king. These temples were built on elevated platforms of beaten clay, in some instances cased with massive walls of stone, the object being to raise them above the level of the plain for architectural effect and to avoid inundation. A brick burial vault at Mugheir exhibits a rudimentary arch. The vault is seven feet long, five feet high and three feet seven inches wide. The sides slope gently outward until the springing line is reached, wheu the successive courses are pushed toward each other until they meet at the top. Similar arches are found in early Greek work at Phigalia, Messene and other places.

The old notion that the round arch was of Roman, and the pointed arch of Gothic origin, has been dissipated by tbe spade of the archæologist. Both of these varieties are found in Assyrian work. They are usually of brick, and occur in underground conetruction, as drains and vaults. The brick arch existed in Egypt as early as 1540 B. C., and a stone arch has been found dating from 600 B. C.

The masonry of the past is, of course, identical with ours, since we have simply adopted the methods of the ancients. We find in Egypt and Western Asia smooth and rock-faced ashlar, rubble and irregular range work essentially like that of to-day. The Assyrian and Egyptian bas-reliefs indicate their method of moving heavy masses. Sledges were used, drawn by large bodies of men. Rollers were placed under the sledge, and the piece was carefully "guyed" by parties of men with appropriate ropes and props.

The Roman military roads crossed mountains and valleys without regard to the nature of the ground; tunnels, open cuts, embankments and bridges frequently occurring. Place cross ties and steel rails upon a Roman road aud suppose the grade not too steep, and the points of approach and divergence of modern and ancient engineering are at once apparent. Substantially the suhstructure was the same as that of a modern railroad, hut in place of the pedestrian or the ox team we have the locomotive, with its "fast express" or heavily laden freight train.

The Nicaragua Isthmus Canal.

A congress is now sitting in Paris, under the Presidency of M. de Lesseps, to decide between two rival French schemes for the construction of tbe canal to unite the Atlantic and Pacific oceans. One of tbese, the most plausible is that of M. Blanchet, a pupil of M. de Lesseps, who proposes to go farther north than the Isthmus of Darien, to avoid the numerous difficulties of that route, hy utilizing the Lake of Nicaragua. This plan bears some general resemblance to the American plan of Lull and Menocal, though it still differs from it both in principle aud in details. M. Blanchet proposes to start from the Pacific at Port Brito; then, after reaching the lake, shoot right across for the San Juan river, follow the river for nearly its entire course, and reach the Atlantic by a short cutting to San Juan del Norte. Port Brito and San Juan del Norte would, therefore, form the extremities of the canal. Lull and Menocal propose pretty much the same course, hut where M. Blanchet differs from them and from all other projectore who have suggested this route, is in his proposal to prolong the lake to the adjacent valleys on either side, and thus extend the area of lake communication between ocean and ocean—to do in fact what M. de Lesseps did at Suez with Timsah and Bitter lakes. The main point in all these Nicaraguan schemes is the existence of the lake. Here is a vast sheet of water stretching half way across the neck of tbe continent; here in fact is half your work done by nature. Now, M. Blanchet goes further, and says that with comparatively small labor you may virtually prolong this lake far down the San Juan valley on the Atlantic side and the Valley of the Rio Grande on the Pacific side. Then, as you approach the low-

lying lands at the nutlet (the lake being of a higher level than the adjacent ncean) ynu regnlate the flow hy a donble series nf locks nn the Atlantic side and a single series nn the Pacific side. M. Blanchet requires 14 locks for Nicaragua, while those called for by the Selfridge plan for Darien number 22; those nf the former, besides, lie together in groups, which makes them more easy nf management. The narrowest part of his canal is 164 feet wide, with a draft nf nearly 31 feet, and for the greater part of its cnurse it is, properly speaking, no canal at all, but a broad lake. Its estimated cost is about $40,000,000, which, doubled, would still leave a sensible difference in outlay between that and all other schemes. Thero is another consideration. As most of the trade of the world is with the northern rather than the southern half of the American continent, there will he a considerable saving of time and distance by the use of the more northerly routo. Vessels, for instance, sailing from the Gulf of Mexico to Califoruia, or the reverse, would gain nver 700 miles hy crossing at Nicaragua instead of at the isthmus. In addition to this, they would get rid of the risk of the frequent calms nf the Gulf of Panama, the outlet of the isthmus nn onc side, where sailing ships are eometimes detained for months at a time. The salubrity of Nicaragua ie an immense advantage, as facilitating the importation nf labor and the general prosecution nf the work. The canal of Selfridge, by Darien, taking its tortuous curves into accnunt, would be 204 miles long; the line nf communication in the Blanchet plan is actually less—only 180 miles. The Suez canal, it may be etated for purposes of comparison, ie 99 milee long. Thc lowest draft of water at Suez is 26.4 feet; at Darien, Selfridge would give a minimum of 26.2 feet, a trifle less; at Nicaragua, Blanchet would give a minimum of 31.4 feet. The Suez canal was estimated to cost $40,000,000, and the actual bill camo to $96,000,000. The Darien canal is estimated at $120,000,000; the Nicaraguan at $38,000,000.

From the Bosphorus to the Euphrates.

The constrnction of a railroad from some point on the Bosphorus on tbe Ægean sea, direct to the navigable waters of the Euphratee, is now a matter of eerioue consideration with English capitalists. Thc road will pass near the northeastern corner of the Mediterranean sea, and it is proposed to have the road touch that sea at some conveuient port—say at Pogas or Alexandretta, eo that direct communication cau he had with the road from those waters. Thie latter becomes a epecial matter of necesseity, now that Cyprus occupies so important a strategical a position in that region. So important a matter is this considered, it is admitted that, if neccsary, even an artificial harbor must he constructed at the point where the railroad touches the sea. Upon the question of conetructing such a harbor at some point fronting Cyprus, and the advantages that would accrue to British trade from its construction, correspondents, dating from Constantinople, write to the Liverpool Chamber of Commerce: "Just in front of Cyprus ie the Gulf of Iskenderun, otherwise Alexandretta, in which Ayaso is situated. Iskenderun would he one of the beet localities for a harhor, being well sheltered."

The advantages of a harbor at some or other of these points would give a great impetus, it is conceived, to the trade of the country, and facilitate and extend Britieh commerce with Turkey. The products of Great Britain are more eought after by the generality of the population than are those of any other foreign country, while the productions of France, Anetria, and Germany are in demand hy tbe higher classes. Openings for new undertakings, and for the establiehment of lines of eteamers, would, it is alleged, he favored and encouraged by the construction of a harbor, to which the abundant produce of the country would flow, as the outlet for its transit to other ports for consumption, and the center for a large British export and import trade.

Rocking Piers for Viaducts.—A novel conetruction has been recently described in *Engineering* as having been employed in the Dyedale viaduct, on the railroad from Christiana and Fredrikshald, carrying a single rail over the Dyse brook. These rocking piere for viaducts are intended to protect the etructure from the effects of expansion and contraction, due to alterations of temperature. The piers which support the superstruoture are of wrought iron with lattice-work weh. In the longitudinal direction of the viaduct, which is some 603 feet in length, there is only a single column hetween each span, poeeessing no stahility in iteelf, and the upper end is allowed to move along with the superstructure when the latter expands and contracts. The lower end of each pier rests on a hinged ehoe, eo that hreaking strains are avoided, and the load is alwaye rendered central to the pier columns. The movement of iron work in a longitudinal direction ie traneferred to the one abutment on which are the necessary bed plates, provided with rollers; on the other the euperetructure is kept in place hy a fixed shoe. With thie arrangement, it is stated that no epecial expansion joint in the raile is necessary, as the sleepers and platforms are quite independent of the expaneion and contraction of the ironwork.

Useful Information.

New Substitutes for Gold and Silver—Aphthite and Sideraphthite.

Some very beautiful alloys, applicable as substitutes for gold and silver in the manufacture nf jewelry and similar purposes, have been produced by Messrs. Meiffren & Co., of Marsoilles. To make an alloy having the appearance and color of gold, they place in a crucible copper as pure as possihle, platinum, and tungstic acid in the proportions below etated, and when the metals are completely melted, they stir and granulate them by running them into water containing 500 grammee of slaked lime and 500 grammes of carbonate of potash for every cubic meter nf water. Thie mixture, dissolved in water, has tbe property of rendering tho alloy still purer. Thcy then collect tho granulated metal, dry it, and after having remelted in a crucible they add a certain quantity of fino gold in tho proportion bereinafter epecified. An alloy is thus produced, which, wheu run into ingots, presents the appearance of red gold of the standard 750.1000, and to which may be applied the name of "aphthite," or unalterable. They can change the color of tho alloy hy varying the proportions of the different metals. As flux they use boric acid, nitrate of soda, and chloride of eodium previously melted together in equal proportions. The proportion of flux to be employed is 25 grammes per kilogramme of the alloy. The proportions they employ, by preference, for producing an alloy nf rod gold color are: Copper, 800 grammes; platinum, 25; tungstic acid, 10; and gold, 170 grammes.

The alloy used in imitation of eilver consists of iron, 65 parts; uickel, 23 parts; tungsten, 4 parts; aluminum, 5 parts; and copper, 5 parts. The iron and tungsten are melted together, and then granulated, as in the case of the previous alloy, except that in tbis instance the water into which the mixture ie run contains one kilogrammo of elaked lime and one kilogramme of carbonate of potash per cubic meter. The nickel, copper and aluminum are also melted together and granulated by running into water containing the eame proportion of lime and potaeh. Care should be taken during the melting tn cover the metals contained in the two crucibles with a flux composed of one part of boric acid to one part of nitrate of potash or niter. In the crucihle containing the aluminum and copper they place a lump of sodium of ahout two grammee in weight when treating five kilogrammes of the three metals (nickel, copper and aluminum) together to prevent oxidation of the aluminum, and they also add charcoal to prevent oxidation of the copper. Before granulating the metal in each crucible it should be well stirred with a fire-clay stirrer.

The granulated metals are dried, as in the former case, then melted together in the same crucihle in the proportions ahove indicated, and well stirred, after which the alloy is run into ingots. The alloy thus ohtained, to which may given the name of "sideraphthite" (or unchangeable iron) presents the same white appearance as platinum or silver, and is not more expensive than German silver. These improved metallic alloys are capable of reeisting the action of sulphureted hydrogen, are unattacked hy vegetahle acids, and but slightly attacked by mineral acids; they are aleo perfectly ductilc and malleable.—*London Mining Journal.*

The Latest New Thing—Banana Flour.—The banana has rccently found a new use in Venezuela. It has the property of keeping the soil moiet round it, in a country where sometimes no raiu falls for months; so it has been employed to give freshness, as well as shade, to the coffee plant, whose cultivation has been greatly extended (Venezuela produced 38,000,000 kilogrammes of coffee in 1876). The Venezuelans can consume hut little of the banana fruit thus furnished, so that atteution is being given to increasing its value as an article of export. At the Paris exhibition were samplcs of banana flour (got by drying and pulverizing the fruit before maturity) and hrandy (from the ripe fruit). The flour has been analyzed by MM. Marcano and Muntz. It. containe 61.1% of etarch, and only 2.9% of azotized matter.

How to Bronze Plaster Statues. — In bronzing plaster statues the powder ie dusted over the etatue while it is yet eticky from a coating of turpentine varnish. The hest way is firet to give a few coats of alcoholic shellac varnish, and then the coating of turpentine varnish, as otherwise the latter is too quickly absorbed. Let it stand till half dry and sticky and then dust over any color of bronze-powder to euit the case.

Zinc plates expand and contract strongly under the influence of change in the temperature, and become quite hrittle in the cold. Zinc, therefore, must be allowed plenty of play room. It should he attached either with nails of zinc or of strongly galvanized iron, as iron nails will rapidly rust out.

Gilt Lettering on Leather.—The leather is covered with white of egg where the lettering is to he done. A leaf of gold is laid on, and the letter punches heated over gas are pioked up and pressed gently on the leather in order. The remainder of the gold leaf is then brushed off hy a camel hair pencil.

Lead Alloys.

Ninety-four parts lead and six parts antimony form an alloy that may be rolled into sheets, and is a little harder than puro lead. This alloy is much used for sheathing for ships.

Twenty-four parts lead and four parts antimony form an alloy that is used in place of Babbitt metal for filling small boxes and bearings.

Twenty parts lead and four parts antimony form an elloy that ie eofter than tho above, and is used for the same purpose. Either of these may he hardened by the addition of more antimony; hut caro must he taken not to use too much antimony, for it will cause the alloy to lose its fluidity, and it cannot be run into the boxes.

All alloys of lead and antimony are rendered more fluid by meltiug them under a covering of oil.

Five parts lead and five parts tin make a heautiful white alloy, used for organ pipes. The mottled or crystalline appearance, so much admired in the pipe, is caused by using an abundance of tin.

One hundred parts lead and two parts arsenic form an alloy from which drop shot is made.

Eighteen parts lead, four parts antimony and one part hismuth form an alloy that expaude on cooling. This alloy is much used for metallic patterns for snap moldiugs.

Spelter-Solder Alloys.

A good solder for copper and iron ie composed of three parts zinc and four parts copper.

A eofter eolder that ie ueed for ordinary brass work is composed of equal parts of zinc and copper.

A very hard but fusible eolder is composed of two parts zinc aud one part copper. This eolder is eo hard aud brittle that it can he easily crumbled in a mortar when cold.

The two first solders are first alloyed and cast iuto ingots. The ingots are allowed to cool in the mold, and then reheated nearly to redness upon a charcoal fire, aud are broken up on the anvil, or iu a mortar, iuto a finely granulated state, for use.

Preserving Cements. — Protection from moisture, even that of air, is very essential for the preservation of cements, as well ae of quicklime. On this account the harrels are generally lined with etout paper. With this precaution, aided hy keeping the barrele stored in a dry place, raised above the ground, the cement, although it may require more time to set, will not otherwiee very appreciably deteriorate for six months; hut after 14 or 16 months, Gilmore says it is unfit for use in important works. But in lumps kept dry, it will remain good for two or three years, and may be ground as required for use.—*Trautwine.*

Good Health.

Utilization of House Wastes.

The whole catalogue of malignant and dangerous disorders, says an ex hange, are caused by the drainage o barnyards and filthy outbuildings into the well, wh ch is often placed so low as to take even the surface drainage, to say nothing of the liquid filth which soaks through the soil and poisons the currents that supply the wells with water. In addition to this, the wash water of the kitchen is often thrown out near the back door, instead of being carried away by a wide and free dram. And then very few people und rstand how dangerous to health are the decaying vegetables and all sorts of impurities that accumulate in cellars under houses, unless they are kept very dry and clean, and carefully watched. The above is excellent, but the New York *Witness* thinks there is more to be said, and adds: "One of the greatest securities of a house is to surround it with grapevines and roses. Though the fruit of the vines is most delici us, and the flowers of the roses most fragrant, the roots of both are just about the foulest feeders known. They will appropriate with astonishing avidity every kind of filth in the soils that would prove noxious to human life, and cesspools especially should be carefully surrounded by them. An amateur gardener informed us the other day of the astonishing success he had in growing peaches and pears from apparently worn-out trees by just using soap-suds and other slops of the kitchen to water them. He had completely overcome the borers by cleaning out a portion of the soil around the trees and filling the cup thus made with boiling soap-suds. And he had banished other insects by washing the bark of the stem with the same."

The above paragraph is making a circuit of our exchanges, and will we trust he productive of much good, for it is true and the advice given is most practical, if hut a little time he given to the application of it. Thinking, perhaps, some of our readers may he interested in some little dooryard irrigation echemes which we are introducing arouud our home in Berkeley, with a view to realizing the henefits of the fertilizing matter contained in house wastes aud in placing the same where they shall he inert in deleterious influencee upon the health of the household, we will give an outline of our operations.

We use the dry-earth system, indoors by means of a Wakefield earth closet, and outdoors by means of an outhouse which has no vault but a tight compartment helow, the floor of which is level with the surface of the ground in the rear and is closed hy a door hanging hy hingee on ite upper edge. In this box dry earth and coal ashes are thrown regularly and the contents deodorized. This material with the emptyings from the indoor earth closet is applied as a fertilizer inthe flower hede.

This provieion restricte the discharges from the waste pipes of the house to the soapy water from the hath-room, waeh-tuhs and kitchen-sink. The pipes connect with an iron stonepipe which leads to a cesspool four feet square and eight feet deep, with planked sides, which is sunk two feet below the surfaco of tbe soil, about 30 feet from the rear of the house. As the lot slopes toward the front, the water from the house is delivered at an elevated point. In to the cesspool is inserted a wooden pump, costiug $5, which raises the water in large quantities to its nozzle which is about three feet above the surface of the ground. As the slope briugs nearly the whole lot within reach of water flowing uaturally from the pump, we have made a lot of light V-shaped troughs, by nailing together pieces of half-inch redwood, aud around the lot, following the lines of the hedges and flower heds, we have a series of stationary supports into which a line of the troughs can he placed in a few minutes' time, and a stream of soapsuds can he sent along them from tbe pump to the farthest corner of the lot. We then put an assistant at the pump and manning tbc hoe nurselves we direct the water to the plants or uear them, and ae portions are sufficiently soaked we take off a length of trough, and so on until we have followed the line backward to the pump. Then the troughs are put on the supports aloug another line and tbe pumping hegins again; and so on until the plants are all irrigated or the cesspool pumped dry. Tben we go over the linee quickly with the hack of a rake, push the dry soil over the flooded spots, and the water is all covered under where it will do most good.

We could of course dig channele along the eurface of tho soil and let the water flow down them from the pump, hut this would flood the whole premisce and expose a large surface drenched with dirty water to tho eun, which would not he conducive to health nr comfort. By meaus of the troughs the water is easily carried over walke aud bordere without spilling, and after the dry earth is pushed hack and the surface leveled there is ecarcely a trace of the irrigation, and the earth effectually aheorbs all the deleterious qualities of the waste water.

Of course we mention our eystem only as applicable to small gardens and where the owner can take a delight in a littlo outdoor work himself at an odd hour. It might be an expensive way to dispose of sewage if one had to hire all the work done, hut as we practice it, we are freed from the neighborhood of an offensive cesspool or drains, and we have all the potash and other matter which we buy in eoap and all the fertilizing matter gained by cleansing processes, carried directly to the roots of our plants where it is made to do good eervice. With the aid of an assistant at the pump we can etow away ahout 800 gallons of water in an hour and a half, so that the undertaking is not a very arduous one.

Keep Dwellings Dry.

Saye the Cincinnati *Artisan:* "A warm and dry atmosphere is not unwholesome, but when cloudy or rainy weather hringe a sultry air which dampens everything around us, the atmoephere may be loaded with the germe of dieease, and fire is needed to destroy them. The walls, the ceilings and the floore of apartmente should never be allowed to become damp. Sometimes, when the warmth of the air is oppressive, fire is more necessary to preserve health than it ie at another season to protect us from the cold of winter; aud the rooms of a dwelling should nover be left without the meane of warming and drying. Investigations have shown that many of the most fatal diseaces are caused by the germs of vegetable and auimal life, and that a humid atmosphere is most favorahle for their propagation. It is, therefore, uegleeting to avail ourselves of the great discoveries of the age, and failing to protect ourselves from the ecourges which so fearfully afflict families, when we ignore the dangere which surround us. Apartmeuts exposed to the full action of the sun may be less comfortable in hot weather than those from which the sun'e raye are excluded, hut they are more wholesome, and when contagious diseaeee prevail in closely-built cities, it is fonnd that the inmates of housee on that side of the street expoeed to the suu are less liable to be attacked, while tbe greatcst nuniher of sick are alwaye found where there is the least exposure to the rays of that great disinfector—the sun.

Coffee as an Invigorator.—A correspondent of the London *Lancet*, who owue a waterpower mill, says: "I am frequently compelled, during this seasou of the year to havo men working in water even in frosty weather. I find that the following allowauce gives great eatisfaction to the men, and we never have a case of cold or injury to them in any way: Kettle of coffee made with half eweet milk, half water, three or four eggs, whipped, poured into when off the hoil; hot toasted bread with plenty of butter, fineet quality. Serve up thie every two and a half hours. The expense is much leee than the usual allowance of whisky and the men work far hetter, and if care ie taken to have the coffee, milk (cream ie still better), bread and butter of the very finest quality the men are delighted with it. I am persuaded it would he worth while to try this allowance instead of grog. Furnishing extra grog gives the men a notion that it ie good for them and perpetuates the belief in stimulants among workmen." [This would perhaps he a good drink for puddlers, especially iu hot weather, when they are often without appetite and weak on account of drinking too much water.]

MINING AND SCIENTIFIC PRESS.

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The Week.

In no part of the mining world are prospects seemingly so dull as on the Comstock. To be sure, all interests have been suffering from the influence of the "hard times;" but, now that the crisis has been passed, and the industrial world generally has become convalescent, the Comstock still lags behind, with no immediate signs of recovery. This is particularly noticeable, in that the Comstocks have, through the Sutro compromise, an advantage of 1,600 feet in favor of their being worked successfully, as against the condition they were in a few months ago. It is hoped and expected that the economy theory now being put in practice will aid materially in awakening them from their lethargy. Something certainly must be done soon, or the public interest must pass from them to Bodie and other outside districts. In the Sutro tunnel everything is in a state of excited activity. There are now four hundred and fifty men at work, and more are being added daily. It now seems as if the necessary additions will be completed easily within the three months allowed by the contract, and that the pumping out of the flooded mines may begin at the end of that time.

Among home strikes, rich diggings are reported found in Placer county, in the Powell and Sophia gravel mines. The old Tybo Con. has struggled to its feet once more, again paid off its creditors, and again started up for itself—it is to be hoped on a better and more economical basis than heretofore.

Outside Prospecting on the Comstock Belt.

In all that pertains to the Comstock lode the Gold Hill *News* may, as a general thing, be accounted a good authority. As the friend of the laboring classes its advice is also apt to be sound and judicious. But when it counsels the working men on the Comstock who are out of employment to engage in the business of prospecting in that vicinity, we think there may be detected therein a slight departure from the usual practice of that paper. We do not believe that these men, however they may be out of employment, should be encouraged to further spend their time searching for ore deposits along that mineral-bearing belt. On the contrary, we are impressed with the opinion that this class has done too much of that sort of work there already. The development of the Comstock lode in both length and depth is altogether commendable. It is a mighty metalliferous channel and should be explored with system and thoroughness to the most profound depths attainable by human ingenuity and endurance. But no part of this work should be done or attempted by men of small means, much less by the mere day laborer, whose little earnings are his all.

The *News*, as if a little dubious about the soundness of this advice, remarks in an apologetic sort of way, that it would be better for these men to so employ their time than to remain idle altogether. As between these hard alternatives there is of course not much to choose, though we incline to the belief that the laboring man might as well lay off and take it easy as to waste his time and strength in the useless manner by the *News* suggested. A better way than either would be for him to leave the Comstock, where labor has always so accumulated in excess of demand, and repair to some other part of the country, where, if employment were no more plentiful, the inducements to prospect for mines would at least be better.

Within four or five miles of Gold Hill, and within the limits of what has generally been accounted the Comstock ore belt, there has in times past a good deal of this sort of poor man's prospecting been done. If we were to estimate the value of the time and means so spent at ten or twelve million dollars, it would hardly be excessive. For nearly twenty years now this business has been in progress; carried on at first by an army and afterwards by many hundred hopeful, resolute, hard-working men; for they were not idlers, inexperienced or empty handed, this army that California sent over to prospect the Comstock. They were veterans from her gold fields, trained to the business and hardened with toil. Inspired with expectation they labored diligently and well. Shafts were sunk, tunnels were driven and deep cuts opened along the outcropping veins till the mountains from Carson to Truckee were honeycombed with these excavations. Disappointed in their reasonable hopes the first crop of prospectors retired from the field only to be followed by others who in turn gave way, the crowd of hardy adventurers having come on in endless succession. And what has been their reward? What the recompense of all this expenditure and toil? Will the local press over there point to a single success achieved by these prospectors? Where is the mine they have opened? Where the ore body, the first element of a mine, that has been developed by these myriads of hard-working men? Or if they have ever found anything of value, what chance had they to retain it? If, at any time these prospectors have happened to strike something promising, has it not been claimed and eventually taken from them by the older and more powerful companies pretending to hold under earlier locations, or claiming it as a part of the main Comstock? For the poor man to prospect on that metalliferous belt or near it is but an idle waste of time, the chances of his striking anything worth striving for being altogether desperate, while if he happens to get a fair showing of ore, the deposit will most likely be wrested from him under one pretext or another.

Only along that section of the Comstock commencing at the Overman and extending thence north for a couple of miles, and covering a lateral space of a few hundred yards, has there ever been developed any mines of permanent value in that entire region of country, except it be in the vicinity of the Alta and Justice. Our Gold Hill contemporary refers to the success that has attended explorations in the Flowery district, and in the direction of American Flat as encouraging further prospecting in those outside localities. This, we take it, is intended as a bit of irony, seeing that none but the most disastrous results have attended prospecting in both these places. Does the *News* know of any mine in either of these localities or of any Washoe mine outside of the strip of country above mentioned, that is paying dividends, or has ever paid any, or even expenses? Does it know of any such mine that has ever yielded any considerable quantity of ore or any quantity at all for more than a short time, just long enough to have betrayed the ill-fated shareholders into the mistake of putting up hoisting and reduction works prematurely? We have no knowledge of any such property, and would be glad to be informed of the fact if any exists, has existed or is ever likely to exist.

Where they have mines on the Comstock they are mines indeed. The world has yet to elsewhere see their like. But so far as developments have gone, there are not many of them. Two miles in linear and half a mile in lateral extent covers the whole of them. But they have yielded some hundreds of millions of bullion, nevertheless. And their history is a grand one. Their record, with some little exception, is one that meets with general approval. The energy displayed in the management of these mines is something marvelous. And deeply as they have been explored, they still call for further downward development. There is every reason why new explorations should be undertaken along the line of the Comstock lode, both to the north and south of the present site of active operations. It might possibly be the part of wisdom to more thoroughly prospect some of the outlying lateral lodes. But this is all work to be done by men of large means and not any of it by those dependent on their daily earnings for subsistence.

Matters on the Comstock seem at last to be getting into better shape. In the settlement of the leading companies with the Sutro Tunnel corporation, in the tendency to restrict explorations to a few favorable points and push them there to determinate result, and in the efforts to simplify the administration of affairs generally, there is to be discerned the outlines of a wiser policy than has heretofore prevailed, and one that is to be hoped will meet with early adoption.

As regards the unemployed laborers on the Comstock, while it seems pretty clear that they should waste no more time prospecting in that vicinity, it is not so easy to point out exactly where they can go with a certainty of getting work or otherwise bettering their condition. Southwestern Nevada would seem to open just now a pretty good field for prospectors. The chances for getting work off that way are also tolerably good, many new mines being opened in Bodie and the adjacent districts. In the course of a couple of months there promises to be work for many men in the grain fields of California, though there will be here no dearth of hands, while the wages will be low, and it is a long time to wait. By the time, however, that the crops in this State are gathered, those in Nevada will be ready for the reapers, so that the harvester might, by making the round, extend the working season over several months. Touching the business of wood chopping, charcoal burning and other local industries, miners will be advised as to the openings and opportunities these may offer in their respective neighborhoods.

The Waterhouse & Brewer Engine.

We saw, this week, at Thomson & Evans' machine shop, 112 Beale street, a wonderfully simple little steam engine, which was built to send to Sacramento. The engine was invented by A. G. Waterhouse of Sacramento, the patent being owned by the inventor and Dr. B. B. Brewer of the same place. The engine has no screws, eccentrics, or parts to get out of order or that need adjusting, being composed of only a solid pitman and piston, and a small ring dropped into an open cylinder. The ring acts as a valve, being worked by the action of the piston. It is self-tightening, needing no adjustment, and controls the steam so as to make it perform its duty without leakage or loss of power. By putting two of these engines together, a large one and a small one, the small one exhausts into the large, thus using the steam over twice and making a compound engine of it.

If desired, either engine can be used separately, making different degrees of power. These engines require only a small part of the work to manufacture, that it takes to make an ordinary engine, nor does wear impair their working. They can run at very high speed and are cheap and economical. Any one interested in such articles will be interested in examining these engines, which are made in different sizes, from one to twenty-horse-power. We saw a practical engine there weighing only half a pound. A larger one weighed only 45 pounds without the fly-wheel, and it can be used single or compound. The simplicity of the engine is so great that it can be sold at a remarkably low price.

THE GOLDEN GATE SENTINEL is a handsome, eight-page paper, published in Oakland, semi-monthly, in the interest of the Ancient Order of United Workmen. It has lately been decidedly improved by its new proprietors, and deserves to be extensively patronized by the lodges and individual members of the "young giant" Order it sensibly and faithfully represents. We are acquainted with its conductors—Messrs. Glenn and Price—and look upon them as men worthy of success, and bound to achieve it with their commendable publication.

A HARBOR OF REFUGE.—Congress having made an appropriation for a harbor of refuge on the Oregon coast, various points are competing for the location, Cape Foulweather, the mouth of the Columbia, and Port Oxford being the most prominent.

Flooding the Colorado Desert.

General Fremont, now Governor of Arizona, is at present in Washington, whither he has gone for the purpose of urging upon the attention of Congress and the General Government, certain enterprises calculated to promote the welfare of that Territory and the regions adjacent, and also to enlist capital in the mining interests of the country. Among other projects of this kind, is one designed to flood the Colorado desert, and, in fact, convert it into a great inland sea, by opening a passage from the Gulf of California, and allowing the water to enter and overflow a large area in the southeastern corner of this State, and we presume also some portions of the northern part of Lower California, inasmuch as the head of the Gulf lies a long way south of the line, and wholly in Mexican territory. The area of country to be inundated is represented as being two hundred miles long and fifty miles wide, this new body of water to have an extreme depth of three hundred feet.

That this project is not only feasible, but easy of accomplishment, admits of no doubt, the district which it is intended to submerge lying below the level of the Gulf, from which it is separated by only some slightly elevated ridges, said to be depressed in places almost to sea level. The question is not so much one of financial and engineering difficulty, as of economical and sanitary considerations, fears having been expressed that the flooding of such a shallow basin, with its marshy borders, would breed enough malaria to endanger the health of the regions adjacent; the query also being suggested, whether it would be good policy to convert this district, desert as it is, into a vast expanse of salt water merely for the beneficial effects it would be likely to exert on the climate of the surrounding country and the facilities it would afford for inland navigation.

That the presence of so large a body of water would tend to moderate the temperature of this, the hottest and driest section of California, admits of no doubt. This lake would also open navigation to vessels of deeper draft than can now ascend the Colorado. But what business would there be for vessels on a lake like this, surrounded by sterile regions, destitute alike of agricultural and mineral resources? There are mineral-bearing lodes far to the north, on both the California and Arizona sides of the Colorado; but none, so far as we know, within a hundred miles or more of the site of this proposed inland sea. Unlike the Mohave desert, adjoining it on the north, this so-called Colorado desert produces much grass—so much in fact, that with water for stock, it would really be a valuable grazing district. As it lies so low, a great deal of it being depressed from fifty to three hundred feet below the sea level, it is probable that good water could be obtained by artesian boring—very likely, merely by digging. What little water there is near the surface is generally bad, being impregnated with alkaline, saline, or other substances of an injurious kind. At greater depths, it would no doubt be more plentiful, and of a better quality. The Railroad Company have, we believe, got good water at several points on this desert by boring, and that without going to very great depths.

With railroads traversing these deserts, such inland navigation as a lake of this kind would afford becomes of less importance; provided, always, there were any local carrying of consequence here to be done; which, as before remarked, there is not. The Southern Pacific road crosses this great arid basin diagonally and on its longest axis, affording every needed facility for supplying it with goods and shipping its scanty exports. Not much need for steamers circumnavigating the peninsula to perform this service.

It will be observed that this plan for introducing the salt water of the Gulf upon these dry lands and covering them up altogether, forms no part of the scheme of Dr. Wozencraft, who, on the contrary, proposes to irrigate them with water brought in from the Colorado river, and thereby convert them into a great tobacco, rice and cotton-producing region; an enterprise quite as feasible and seemingly more desirable in an economical point of view than this more recent and novel enterprise of the "Great Pathfinder."

PHILADELPHIA EXPOSITION.—The permanent exposition in Fairmount park, Philadelphia, is still maintained as a monument to the memory of the great Centennial. A friend in Philadelphia writes that it is proposed to enrich the display in a number of directions, and suggests that it would be opportune to send a standing exhibit of California's resources and productions. We publish the suggestion in case that it may reach one who is interested in showing up our state. As a rule, our State is rather off on the show business. It seems that the severe exertions to tackle immigrants, put forth four or five years ago had tired out the State, and it will need a good rest before it buys a new tent and hand-organ. This is not because there is any less to show than there was, but because all are somewhat disposed to let foreigners do their own view hunting. However, if anyone has the impulse to make a creditable display before Eastern eyes, by all means let them do it.

DOUBLE SHEET—24 PAGES.

Sonora, Mexico.

A Rich Country Whose Trade May Be Controlled by San Francisco. A Few Facts Concerning Sonora and the Proposed Sonora Railway.

The attention of San Francisco merchants and capitalists is being directed more strongly year by year to the importance of establishing commercial intercourse with the northern and western States of Mexico. The people of that section, particularly of Sonora, where they are removed from and have little sympathy with the revolutionary intrigues of the national capital, and do not partake so strongly of the national jealousy of the "Gringos," are becoming eager for the establishment of commercial relations with the United States, as they realize that American goods for which they have use are superior to those of English or German manufacture. Our calicoes and other cotton fabrics, our agricultural machinery, wagons, domestic and general hardware, cutlery, etc., are of a quality so much better adapted to their wants that the Mexican people will not buy the European articles offered them if they can get those of American production. This is a condition of affairs that only requires fostering to bear abundant fruits to American enterprise. Sonora, therefore, is ripe for an interchange of trade with California. The inauguration of rapid means of communication and ready facilities for transportation will effect this object certainly and surely. As a means to this end

The Sonora Railway

and telegraph line, projected from Guaymas to cross and terminate point on the southern border of Arizona, will be a most important factor. The accompanying outline map herewith presented shows the location of the principal rivers and towns of the section of country through which the surveyed lines of this railway pass. The Mexican government has manifested its desire to encourage an enterprise of this kind by granting to several individuals, resident in San Francisco and Mexico, a concession whose terms are exceedingly liberal, comprising exemption from import duties and State and general taxes for a term of years, free right of way, land grant of some 22,000 acres per mile, and other important privileges. The road will be commenced within a year, and will doubtless connect with the American system of railways at more than one point, as, in addition to the main line, as laid down in the map, a branch line is projected, starting a short distance south of the Arizona border and running eastward through Mexican territory, across the low Sierra Madre to the Rio Grande at or near El Paso, connecting with the Atchison, Topeka & Santa Fe railroad, the Denver & Rio Grande railway, the Texas & Pacific railway, or some other of the lines stretching out toward that focal point. The line at present under consideration, from Guaymas northward, passes through the heart of Sonora, a State whose mineral and agricultural resources, but partially developed, are superior to those of California, with a climate of great salubrity and an abundant rainfall to mature at least one crop a year, without irrigation. The distance from Guaymas to the border by the easternmost of the three surveyed routes is 265 miles, and the cost for a broad gauge road is estimated at but three and a half million dollars, or an average of but little more than $13,000 per mile. This low estimate is based on the exceedingly favorable topography of the country through which it passes, the cheapness of Mexican and Indian labor available (which is less than the Chinese labor of California), the low cost of importing material under the exemption of duties granted by the concession, and other favorable circumstances.

The Harbor of Guaymas.

The terminal point for the railway on the Gulf of California, 1,530 miles by water from San Francisco, is eminently the best on the western coast of Mexico, being much superior to either San Blas or Mazatlan, and because of the trade winds, particularly desirable as a port for the trades of the East Indies and China. The bay consists of an inner and outer one, in all four or five miles in length, almost completely sheltered from the winds by the bold hights of Pajaros on the east and the islands of Terra Firma, San Vicente and Petayas on the west, leaving the channel narrow and deep between them. The tides are irregular, being governed by the winds of the Gulf, seldom rising and falling more than four or five feet. The depth of water is from two fathoms at the moat, to eight fathoms in the channel. The harbor is capable of giving good anchorage to 200 vessels. The town of Guaymas contains some 7,000 inhabitants, and has an active trade, as it is the port of entry for nearly the whole State, while the large quantities of flour and other produce of the interior are here shipped to other ports along the coast. It is also shut in by high hills forming the fringe of the interior plateau that rises up from the coast with considerable abruptness. The railway can surmount this coast range with little difficulty and once upon the plateau the profile of the country for the greater portion of the remaining distance is that of an absolute plain, with scarce a variation, presenting a gradual rise of from 10 to 60 feet per mile to the summit of the dividing range near the Arizona border, where an elevation of about 4,300 feet is reached.

Hermosillo

Is 100 miles from Guaymas, on the line of the proposed railway, and the most considerable town encountered on the route. It is situated on the Sonora river, at a point where that stream cuts through a bed of beautiful white marble, pure enough for use in the arts, free from blemish, pure in color and susceptible of high polish. Yet, strange to say, the inhabitants of the city have been content to construct

MAP OF SONORA, MEXICO, AND SURROUNDING COUNTRY.

their dwellings of adobes, as their ancestors have done from time immemorial, making no use of the marble so accessible to their hands. Hermosillo has the reputation of being the most handsome city in Sonora. It is embowered in leafy gardens and luxuriant foliage, watered by canals from the river. It contains an estimated population of 12,000 inhabitants, with empty houses for as many more. Its depopulation has been caused by reduction of various industries to the north from Indian raids and by internal wars—the universal story in Mexico. It contains a mint, coining more than one million dollars annually. This, however, does not by any means represent the bullion product of Sonora, as a large amount is exported in the form of bars and crude ores, and a considerable quantity of bullion is smuggled to avoid coinage and export dues.

Agricultural Industry.

All up and down the Sonora and San Miguel valleys, where water can be obtained for irrigation, large crops of wheat, corn, tobacco, sugar and cotton are raised. The yield of the cereals is enormous. Wheat produces 40 to 60 bushels to one bushel sown. The rainy season sets in early in June and continues to October, though occasional showers fall until March. Most of the wheat raised is made into flour for export. Six flouring mills in the city of Hermosillo produce an average of 3,500 tons of flour of superior quality per annum. One is run by steam, one by horse-power, and the rest by water. There are 30 mills of like capacity in the immediate neighborhood of Hermosillo engaged in the manufacture of flour. The wheat is washed in vats and spread upon adobe floors to dry prior to being ground. The millstones in use have heretofore been French burrs, but a superior quality of millstone material has been discovered near Guaymas, which is coming into general favor. With the opening of the railway this quarry will doubtless yield millstones for export to California and other parts.

Agriculture has made wonderful strides in Sonora in the last few years, and on many of the large haciendas the equipment of farming machinery is scarcely inferior to that of the mammoth ranches of California. American headers, gang-plows, threshing machines and wagons have largely taken the place of the crude implements of former times. This has been brought about by the fact that the wealthier classes have in late years sent their sons abroad to be educated. The young men are now taking hold and introducing the progressive ideas which they have imbibed from association with more enlightened nations. The influence of the rising generation of educated men on the affairs of State give rise for strong hopefulness of the future prosperity of Sonora, and the adoption of a more liberal policy of commercial association with other nations. Indeed, they entertain the most exalted idea of the capacity of Americans and are in a condition to receive those who come among them with capital to develop their resources with unreserved welcome and encouragement. There is a clan in political circles that even favors annexation to the United States, although they would prefer secession from Mexico and absolute independence. The public sentiment of that section may be set down, however, as strongly opposed to any continuance of internal strife. As a

Grazing Country,

Sonora, particularly in the northern part, is destined to pre-eminence. The higher lands, unfit for agricultural use, are covered with a growth of nutritious grasses, adapted to sheep and cattle ranges. There are three varieties of grasses upon the lands; the mesquit grass, confined to the ranges of the mesquit timber; the *sacatom*, a coarse species found on the higher ranges, and the *grama*, occupying the plateaus and less elevated hills. The latter variety has much the appearance of dry, curled whittlings of pine wood, is very nutritious and is greedily eaten by animals. Throughout the entire year the cattle graze upon the hills, there being no need to preserve the grass.

Timber

Is more plentiful in northern Sonora than in the southern part of the State, and along many of the streams cottonwood, ash, black walnut and sycamore abound. On the bottom-lands are dense forests of mesquit, a species of acacia, yielding a fair quality of gum arabic, and growing sometimes to a diameter of three feet. It is unequaled for fuel, burning long and fiercely with an intense heat. It is particularly valuable for charcoal.

Anthracite Coal.

Sonora possesses a vast field of anthracite coal—the only anthracite yet discovered on the Pacific coast. It is said to belong to a very old geological formation, probably Silurian or Devonian. The only outcrop which is at present worked lies about 120 miles northeast of Guaymas, and a branch line of the Sonora railway is contemplated to develop it. The mine is a few miles north of the flourishing mining towns of La Barranca and Los Bronces, each supporting some 2,000 inhabitants. The coal has been used for two years for steam purposes at the Barranca quartz mill. The engineer in charge of the mill, who has had a long experience on Atlantic steamers, where he used Pennsylvania anthracite, believes it superior to the latter, the Sonora coal containing less ash and leaving no clinkers on the grate. It burns with the short, blue flame of carbonic oxide, which is characteristic of all anthracite coal. There are three veins of the coal, one of which is seven feet thick, another two and one-half feet and the third of unknown thickness, while there are indications of a seam lying beneath the 7-foot vein—the one now worked—of the same or greater thickness. Outcroppings of the veins are traced for many miles. The analysis of this coal as compared with the average grade of Pennsylvania anthracite is as follows:

	Sonora Coal.	Pennsylvania Coal.
Fixed Carbon	94@96%	85% (about
Ash	3@4 %	10%
Moisture	1@2 %	4@5%
Sulphur	0.0 %	a trace
Bitumen	0.0 %	a trace
Specific gravity	1.77	1.50

The dip of the discovery is 26° toward the opening, rendering the mine easy of drainage and cheaply worked. The length of the branch from the main line at Noria del Valle (32 miles from Guaymas) necessary to reach the mine, is 98 miles. It is estimated that after the construction of the road the coal may be marketed in San Francisco and South American ports at $8 to $9 per ton. San Francisco consumes 600,000 tons of all coals annually, and Mexican and Central and South American ports consume 650,000 tons, for steamship purposes alone. About 700,000 tons of this is of foreign importation; its value is $6.50 to $10 per ton. The value of anthracite coal is from $12 to $15 per ton. San Francisco consumes about 22,000 tons of anthracite coal annually at present prices. The opening of this mine and its introduction to this market at the prices estimated would be of vast importance to the manufacturing industries of this city and the interior. Specimens of the coal have been brought to San Francisco and exhibited, exciting the admiration of all who have seen it.

The Mines.

Great as is the wealth of Sonora in agricultural and pastoral resources, her chief glory lies in her mines. The low mountain ranges abound in minerals, but the mines which are profitably

worked are but few in number compared with those whose wealth has besn explored and definitely known, but whose development has been prevented or retarded by the incursions of the murderous Apaches that have, until a few ysars past, infested and laid waste ths outlying districts.

A Romantic History.

It is not the purpose of this general articls on the resources of this little known country to describs tbe mines of Sonora, but there attaches to ons section of the State near the American border, a history so romantic that a condensed account of it must prove generally interesting, particularly as it is the only portion of Mexico where placers of silver were ever known to exist. The "Planchas ds Plata" (literally, slabs of silver—enticing name!) is the nams givsn to a locality in ths Arizona mountains, a dozen milss south of ths border, 75 miles due south of Tucson and 45 miles due north of Magdalena, where, 121 years ago, according to the archives of Spain and Mexico, Spanish explorers discovered largs masses of pure silver on the surface of the ground, and at a depth of a few feet, in the form of slahs, balls and grains, some of them very large—one weighing as much as 140 arrobas (3,500 pounds), which had to be melted down to be weighed and transported. All these discoveries were claimed hy the Crown, and no encouragement being given to miners to remain in the presence of hostile Indians, the mines were speedily abandoned and the records locked up hy the Jesuit Fathers, so that they could not readily be traced.

Later, in 1817, Don Dionisio Robles, a citizen of Rayon, witb a large force, 200 mcn, penetrated the district, found what they helieved to be the old placers and obtained a considerable quantity of silver in pure masses. The Don was in turn compelled hy tbe Indians to abandon his discoveriee after a stay of only eight days. About the year 1850, in an expedition made hy parties from Hermosillo, a large lump of native eilver was found, which was carried to the City of Mexico and caused considerable excitement there. About this time also, the great banking house of Jecker Torre & Co., of the City of Mexico, obtained from the Mexican government a grant of all the mines in the Sierra de Arizona and lands for tbe purpose of colonization. By their orders, and at their expense, an expedition was organized in San Francisco in 1852, nnder the command of the unfortunate Count Gaston Raousset de Bourbon, of 400 thoroughly disciplined men—old French eoldiers. They landed at Guaymas, and, after considerable delay there, marched to Saric, a village on the north branch of the Magdalena river, near the Planchas. Here they remained six weeks, but without any other attempt to enter the district than by a small party of cavalry under command of Captain Le Noir, which was absent three days. Owing to the intrigues of the rival house of Barron, Forbes & Co., in Mexico, and the jealousy of the new Governor, every obstacle was put in the way of Raousset to the accomplishment of the ohject of his expedition —the rediscovery of the old placers. Theee intrigues finally ended in an open rupture, upon which Raousset marched to Hermosillo, where he met the government troops and defeated them in a severe engagement. He was subsequently taken sick (some say poisoned) and carried in a litter to Guaymas, where his officers, nnder an arrangement with the authorities, reembarked their men for San Francisco.

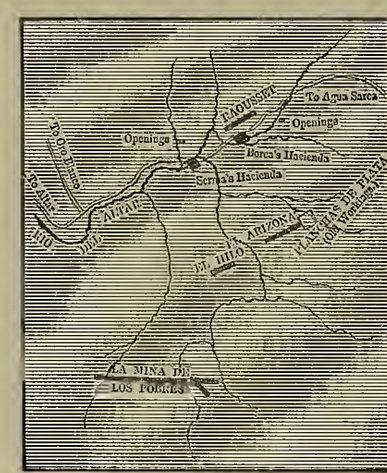
In 1854, Raousset organized another expedition in San Francisco, similar to the first, and landed in Guaymas. Again enconntering the opposition of the authorities, an engagement ensued in which he was defeated and taken prieoner, tried by conrt martial and shot.

In 1870-71, Gen. Serna, then (Vice-Governor of Sonora, obtaiuing some particular information regarding this district, organized another expedition to discover it. The hostile Apaches, through the efforts of Gen. Crook in Arizona and the Mexican authorities in Sonora, had now heen subdued and removed to distant reservations. Gen. Serna had no difficulty in finding the spot from which these large masses of silver had heen taken, and himself found a lump weighing 45 pounds. No less than 40 tons of pnre silver are said to have been taken out of this spot. Under his protection quite a number of prospectors and miners went to work on the old, and to search for new placers. The dietrict prospected by them seems qnite emall—not over two or three miles square. No other placer was fonnd, but in the veins which were discovered and opened considerable quantities of pure chlorides of silver were found. A few feet below the surface this became more diffused, the veins widened, and though apparently filled with good ores, no native silver nor rich chlorides were found in sufficient quantities to repay the search. As these men were unprepared to work ores of any sort, the object of the expedition being alone for native or placer silver, after a few months the place was again abandoned, one man only being lcft, who kept up the search a few months longer, meantime sinking a shaft on a vein which he called the "Mejia," to a depth of 45 varas (125 feet), and reducing the ores obtained in a rude way in arastras to obtain money to carry on the search, hut finding no masses of pure silver as expected, and encountering more water than his rude appliances could handle, he, too, gave up.

That the silver in its pure state and in enormous masses, was actually fonud is a matter too fully established by history and official records to admit of a doubt. The space over which they were discovered did not exceed 300 feet square, in such a position on a hillside that it is quite evident the slabs must have fallen or been washed from the outcrop of a wide ledge that cuts the summit of the hill above, designated on the accompanying diagram of the district as "El Arizona." Soms residents of San Francisco, associated with citizens of Mexico, have recently come in possession of the two mines, "El Arizona" and "Raousset," and a company has been organized to work them.

Description of the Mines.

The rock of the country is granite and porphyry. This is generally overlaid with a porphyritic conglomsrate to varying depths in the summits of the ridges. The general direction of all the veins or ledges disclosed is nearly magnetic northeast and southwest. The ore of ths Raousset seems to be all porphyritic, containing principally bromides and chlorides of silver, without gold or base metals. The ore is found in the conglomerate and appears to be in a series of parallel veins, each from two to five feet in width, lying close together and covering the whole surface of the hill. The opsnings are mostly open cuts; seven of them cover a length on the veins of 250 feet and a width of 75 feet, thsir greatest depth being only 20 feet. "El Hilo" is half a mile south and at an elevation of 4,100 feet above tide. The ore is very rich in chlorides, and from a cut 30 feet long, two feet wide, and four or five feet deep, Gen. Serna, iu 1872, is said to have taken $12,000 from the chloride ores and 50 pounds of silver from a single lot of 400 pounds of rock. The mine is now being worked by Mexicans. About a mile south and west of "El Hilo" is the shaft of the "Mina de los Pobres," which a few months ago was reopened from the old workings, and is being developed by a party of Americans, who have sunk a ehaft to a depth of 25 or 30 feet, where it shows a well-defiued vein, enclosed in granite and porphyry walls, having a seam of two inches of talc in the hanging wall. The vein is exposed by prospect holes for a distance of half a mile. The shaft is near the summit of a high ridge, 4,400 feet ahove tide and 200 feet above the gulch. A tunnel is being driven into the hillside 145 feet to intersect the vein 55 feet below the bottom of the shaft, and at a point 30 or 40 feet distant from it. The work progresses slowly on account of lack of funds. Some samples of very rich ore have been taken out mostly free-milling chlorides. Analyses of five samples of the Raousset ore, picked up at random from waste ore at the dumps, are as follows: $93.35, $58.96, $91.97, $186.20, $51.72 per ton. From a prospect hole in El Arizona, near the placers, a piece of rock assayed $82.49. A specimen from El Hilo shaft assayed $279.03, and one from Mina de los Pobres yielded $119.85.



PLANCHAS DE PLATA.

The district lies upon a series of high ridges separated by small gulches which converge toward the spot occupied by the hamlet, lying between Serna's and Borquez' haciendas. The summits of the ridges are from 300 to 600 feet above the level of the village. The sides are generally smooth and unbroken, and covered with a rich growth of grama grass, affording excellent nastures, and dotted with trees, black oak, of good size. Near hy, the higher mountain slopes are covered with heavy forests, principally oak, with some pines. All the gulches contain small streams of running water, aud are considered nufailing.

Such is the description of the famous Planchas de Plata, a district famous in the past, and destiued to he more famous in the future, though let ue hope it may not cost the hlood and treasure to garner its wealth that has been expended in searching for it in the years since its first discovery. The tribulations and trials of these early expeditions are interesting, and, hut for lack of space, it would afford us pleasure to preseut translations of the quaint old chronicles descriptive of them. "Los Apostolicos ofaues de la Compania de Jesus" describes them in detail, and "Noticias Estadisticas del Estado de Sonora" refers to them at leugth. The Sonora railway will greatly aid in the development of the "Planchas de Plata," as it will the whole of southern Arizona, for which it will afford the shortest and most direct route to the sea. But whether that he huilt or not, the district will be made to yield its treasures, and the secrets of the earth be unfolded by the invincible spirit and enterprise of the miner.

A Rival for San Francisco.

In ths foregoing we have shown something of the possible sources of a lucrative local traffic for the contemplated railway, but have scarcely hinted at the through traffic it may have when joined with an Eastern trans-continental railway, shortening the distance across the continsnt more than a thousand miles, and building up a sea port on the Gulf, that will bid strongly with San Francisco for the trade of the Indies.

The Power of Niagara

Dr. Siemens, soms months ago, in an address which he then gave, referred to the immense quantity of power which flows ready made over the Falls of Niagara. In his Glasgow address he again referred to the subject, in order to show how this gigantic source of power might be utilized to produce action at a distance. "Wheu," he says, "little more than a twelvemonth ago I visited ths Falls of Niagara, I was particularly struck with the extraordinary amount of force which is lost as far as the useful purposes of man are concerned. 100,000,000 tons of water fall there every hour from a vertical hight of 150 feet, which represents an aggregate of 16,800,000 horse-power, producing, as the effect, no other results than to raise the temperature of the water at the foot of the fall

$$\frac{250}{772}\ \frac{1^\circ}{5^\circ}\ \text{-Fahr.}$$

In order to produce the power of 16,800,000 horses; or, in other words, to pump back the water from below to above the fall, would require an annual expenditure of not less than 266,000,000 tons of coal, calculated at an average consumption of four pounds of coal per horse-power per hour, which amount is equivalent to the total coal consumption of the world.

In stating these facts in my inaugural address, on assuming the Presidency of the Iron and Steel Institute, I ventured to express the opinion that, in order to utilize natural forces of this description at distant town and centers of industry, the electric conductor might be resorted to. This view was at that time unsupported by experimental data such as I have been able since then to collect."

Dr. Siemens then shows what had been done in conveying the electric light to a distance; and he states that "if mechanical force is required to be distributed, the arrangements are in every respect similar to those for the distribution of electric light; and it has been proved experimentally that the amount of power recovered at the distant etation is nearly equal to half the power employed at the central etation." Even as regards the consumption of coal, were that article used, Dr. Siemens shows that the magneto-electric machine is cheaper than the gas or steam engine.

During the month of February the gold mines incorporated in San Francisco produced bullion to the value of $265,300. The silver mines of Utah, Nevada and Arizona, to the number of 17, produced $535,000. The gold and silver mines, California, Con. Virginia and Ophir, produced $284,600 in gold and $342,400 in silver; total, $627,000. The hase metal mines, during February, produced $108,000 gold, $203,000 silver and $83,100 lead. The total hullion product of 32 mines for February was $1,811,000. The product of 28 mines in February, 1878, was $4,580,900. The 90% decrease is due to the lessened product of the California and Con. Virginia.—*Salt Lake Tribune.*

To Waterproof Canvas.—The *Engineer* gives the following: Add 1½ pints of water to 6 ounces of hard, yellow soap, and when boiling add 5 pounds of ground spruce ochre, ½ pound patent driers, and 5 pounds of boiled linseed oil.

Mining Notes from Siskiyou.

Editors Press:—On the 15th inst. I had the pleasure of visiting the quartz mine of H. C. Cory & Sons. I found two of them at the mine, and I also found a good prospect in the mins. At the surface the ledge is about eight inches. It is down about 30 feet, and in about 42 feet. It is over three feet, honest measurement with taps, for I held both ends of the tape, and know whereof I speak. They have about 15 tons of rock out, and all through this rock I saw gold, not in every piece, but quite often. The rock is well sprinkled, to say the least. At first the rock was soft and easily worked, but now it is hard and requires blasting. Mr. Cory informed me that he will commence crushing in May, and will use the Hartstrand mill. Hs will make some repairs on it, however, before making the run. He has written below regarding the best methods and machinery for saving fine gold. I expect to have favorable reports to make to you regarding this mine in ths future. Tbe other minss adjoining his are watching and waiting the results of this run with considerable anxiety. Even the rock in which we can see no gold, prospects well, and there is no doubt but that the mine is rich and valuable, if it only holds out; present iudications are that it will continue to improve. We hope so, at least, for if anyone deserves euccess it is Cory. Of the French Creek mines, mors anon.

I hear that the South Fork and neighboring placer mines are doing well; also the Quartz Valley quartz mines. Roberts cleaned up a six weeks' run (piping) on Walsh's placer mine, on French creek, witb fair success, and intends making another run. Nelson is opening a new mine on French creek. The weather is stormy, roads bad, and farmers putting in their crops.

R. D. Nunnally.

Etna, Mar. 23d.

Behr's Indicators.

The trouble in indicatore has been to get travel enough for the pointer, so as to enahle the engineer to land his cage at different poiuts in tbe shaft by the indicator, and to avoid the use of tags on the rope, which are expensive and unreliable. The indicator invented by Hans Behr is intended to overcome these difficulties.

It consists simply of two revolving drums, eix feet long and four feet in diameter—one for each reel—placed iu such a position as to be in full view of the engineer and hrakemen, to which is attached a spiral, placed on a pitch of four inches. These drums revolve with and are driven by the reels, and are so geared that the drums make 25 revolutions for 3,000 feet of rope. The pointers are attached to and driven by side screws in such a manner that, as the drums revolve, the pointers move up and down and always point to some portion of the spiral on the drums. Stationary points are attached to the spiral at such places as will correspond to the stations in the shaft.

The effect is that each foot in the shaft is represented hy one inch on the indicator, which gives sufficient movement to enable the engineer to land his cages accurately, even to tbe inch where wanted.

In designiug that king of hoisting engines just placed at the North Con. shaft, Mr. Patton thought these indicators of such importance that he adopted them and they are in place on the engine. They have been adopted also for the engines at the C. & C. shaft, where they are soon to be placed. This is sufficient to insure their general use on the Comstock ere long. —*Gold Hill News.*

The Ship of the Desert Outdone.

A report, says the Visalia *Delta*, comes from the Sierra Nevada mountains of the discovery of the timbers of a stranded vessel, resembling those of a Chinese junk, high up in the mountains, between Mineral King aud the headwaters of Kings river. The souud portions of the timher resemble camphor wood, and it is said, still retain a faint smell. The fastenings are of copper; tbe rigging, etc., are, of course, all gone. A number of bones, supposed to he human, were also fonnd in the vicinity, and upou tbe adjacent slones there is ahundant evidence of the previoue occupation of the waters, in the shape of shells, as well as the occasional finding of petrified fish. That this valley has at one time beeu an inland sea is admitted by geologists, hut that these waters were navigated by Celestial seamen one or two thousaud years ago has never been claimed, even hy the Chinese themselves. But these same people do claim to have been the original discoverers of this country, and this find seems to give color to the claim. It has also been claimed by them that vessels of theirs have been wrecked on this coast, and that portions of the crew have returned to China; but that the wreck itself should be located, and that this location should prove to be in Tulare county, is surely an interesting fact, inviting the inspection of the curious and the solution of the scientific.

How to Make an Emery Wheel.—Take a smoothly-turned wooden wheel, and cover the same with leather, devoid of grease, and coat the leather surface, a portion at a time, with good glue; immediately roll the glued surface in emery spread out on a board.

The Flounders of our Markets.—No. 1.

[Read by W. N Lockington before the San Francisco Academy of Sciences, March 17th, 1879.]

No tribe of fishes is probably so well known to that large class of naturalists whose love of nature takes a practical turn, who like best those creatures which taste best when boiled or fried, as the flounders, flatfishes, or pleuronec. tidæ. Apart from their attractiveness to the sense of taste, they have one peculiarity which challenges the attention of the most uninterested observer of the world's living wonders—they have both their eyes placed on the same side of the head. If a little more attention be paid to this obvious feature, it will be found to be even a greater peculiarity than was at first supposed. The flounders are not the only fishes which have their eyes on the same side of the body; the skates, rays, torpedoes, and their relations are in this respect very similar. Where, then, lies the great difference between these two classes, for no one would confound the two, even at the first glance?

Simply in this, that the skate and ray tribe are flattened downwards, the side which is uppermost is the proper upper side, and the eyes are placed in their usual position with regard to the other parts of the head; whereas in the flat-fishes the body is flattened out sideways, the fish swims on one of its sides instead of on the proper under surface; and the eye, which of right belongs to the side which is beneath, has twisted round out of its place, and is situated on the same side with the other, unsymmetrically with the other parts of the head. Of course this is not the only difference between the skates and the flounders; there are far more important anatomical differences, but it is one of the most obvious outward distinctions between two tribes which, though widely separated in other respects, resemble each other in having the eyes so placed as to look upwards, in their thin flat bodies, colored upon the upper side only or principally, and in their habit of residing at the bottom of the sea, their uncolored surface resting on the bottom. Again, the flat-fishes are not the only fishes which have a very wide body, flattened laterally; the sunfish is also very deep from dorsal to anal, and some of the mackerel tribe are even more excessively compressed; but these and all other laterally compressed fishes, except the flat-fishes, swim in the usual manner, dorsal fin uppermost, and the eyes are in the usual position, one on each side. It will be readily understood that the two eyes cannot be brought round to one cheek without great distortion of the bones of the skull; many of the bones on the colored side are cramped in their development, squeezed into a narrow space, out of the way of the encroaching eye; while some of the bones of the blind side are correspondingly enlarged, filling up, by their lateral extension, the place where, so to speak, the eye ought to be. Now, a distortion of this importance, if it occurred in any other kind of animal, and were not of universal occurrence in the whole tribe, would be considered a monstrosity; and it became an interesting question to ascertain at what point in the life-history of these fishes the distortion commenced. Surely so very important and radical a modification of the skull and bones of the head must commence at the very first commencement of the formation of the fish before it is hatched from the ovium? But it has lately been conclusively proved that this is not the case. Prof. Alex. Agassiz has watched the development of young flounders, and has proved that when first hatched, they resemble other fishes in the position of the eyes and the symmetrical form of the head; and that the distortion is the result of habit, which habit again increases the distortion, precisely as claimed by the advocates of what is usually called "evolution." That is to say, the young fishes seek the bottom of the water, yet strive to use the lower eye. By the continued effort to use this, the soft structure of the head is affected, and an oblique upward view is gained. This renders the fish less fitted than before for locomotion in the usual manner, and more adapted for keeping at the bottom, which it accordingly does, with the result that the eye becomes more and more twisted, till at last it has passed clear over the dorsal ridge of the animal, and makes its appearance on the same side with the other eye. This side is in some species the right, while in others it is the left side. All this takes place while the creature is young, and before the bones are hardened.

But it must be remembered that the bones of fishes are, as a whole, much softer than those of reptiles, birds, or mammals, and therefore much more capable of yielding to impressions from the outside without the destruction of the life of the organism. From a cavity among the roots of a tree, in a pond, a tench has been taken, which was fitted exactly to the shape of its residence. It had gone in when young and small, and stayed till it was too large to go out. The Chinese, by feeding goldfishes in small jars, produce most singular distortions of mouth, eyes, and form of body. When a young fish, whose habit is to feed by pursuing and catching its prey in a horizontal direction, is confined in a small space and systematically fed from above, the direction of the gape of the mouth becomes changed by the constant effort to reach its food. But this is not the place to bring together some of those endless facts of nature, which, drawn from plant and animal alike, from the humble mold, from the coral, the shell-fish, the insect, the fish, the bird, the mammal, aye, and from the history of our own race, and the individual history of our own lives, go to prove that all the varied forms of plants and animals, with all their varied qualities, tendencies and dispositions, are but the result of the interaction between the properties of the materials of which we are composed and the forces which act upon them from the outside; or, in other words, of a constant struggle between the organism and its environment, in which the former either adapts itself to the latter, and thus changes when the latter changes, or else perishes through its want of plasticity.

To return to our flounders. Seventeen or eighteen kinds are now known from the coast of California and northwards, and of these I have found twelve in the markets of this city. Of these twelve, three have their eyes and color upon the left side, but all the others are dextral, that is, have their eyes on the right side, and the color, as is always the case, on the same side with the eyes. Three of these kinds are not sufficiently common to be of much importance as articles of food, but all the others are more or less abundant. Of their comparative delicacy or flavor I am not prepared to speak; in fact, this is just the point upon which I seek information; but it may be as well to remark that no real "sole" is found here, although certain species are sold under that name. Neither can I say much respecting the distribution of any of the species northwards and southwards from this point, some, as I know, from those who have previously written on the subject, occur in Humboldt bay, Vanconver's island, Alaska, and even Kamtschatka, but of others all I know, in some cases all that is known (for two of the species I enumerate have not been noticed before), is that they are found within the range of the fishing vessels which go out from this bay, a range probably limited to Tomales and Bodega bays to the north; the Farallone islands on the west, and the bay of Monterey on the south. Most of those which come from deep water are from near the Farallones. Neither can I tell what is the favorite food of each species. A much more extended series of observations, carried on by the examination of the stomachs of fresh specimens, and by keeping them alive in aquaria, will be necessary before this can be ascertained. In the stomachs of two individuals belonging to two nearly related species, I found the half-digested remains of three anchovies (*Engraulis ringens*), and in one of them a small species of shrimp-like crustacean (*Hippolyte* genus).

The principal enemies of the flat-fishes are, I believe, the ray tribe. As the former are specialized to reside at the bottom of the water, there seeking their food, and, by covering themselves with stones or mud, avoiding the attacks of many predatory fishes; so the rays, on their part, have become specialized to reside principally at the bottom, and to keep down the increase of the flounders. And what chance can a flat-fish, large and strong though it may be, have to escape from the pursuing skate or sting-ray? The former, with but a small pectoral fin on its colored side, while that of the blind side has become partially atrophied by disuse, and with ventrals of minute proportions, can at best but flounder along the bottom, or, with a sudden effort, for a moment attain the perpendicular position natural to most fishes, and then again sink down in the mud; while the latter, equipped with a huge pair of pectoral fins, exceeding the body in size, and able to move along the bottom or rise at pleasure to any desirable hight, flaps along like a huge butterfly; a butterfly, however, that hides beneath its expanse of wing a deadly array of teeth.

Not long ago, in some popular account of fishes and their habits, I read that fishes were usually quiet and gentle, that their very appearance indicated gentleness. Nothing can be farther from the truth. Few fishes are herbivorous; by far the larger part live upon other fishes, the spawn of fishes, or the more lowly inhabitants of the waters, many of them not sparing the eggs or the young of their own species.

Hippoglossoides melanostictus; Psettichthys melanostictus, Girard.—As most of the fishermen and fishmongers of San Francisco and its neighborhood are Europeans, principally Italians and Mediterranean peoples, with a sprinkling of English and New Englanders, they have given to such fishes as they have thought worthy of a vernacular title, names which properly belong to species found in the Mediterranean and Atlantic, and frequently but distantly related to their Pacific namesakes. In pursuance of this rule, the name "sole" is applied to at least four species brought to the markets of San Francisco, two of them (*Psettichthys melanostictus* and *Hippoglossoides Jordani*) sufficiently common, while the third (*Lepidopsetta bilineata*) is somewhat rare. The first of these is the most common and the best known. It does not appear, so far as I have been able to ascertain, to be caught within the Bay of San Francisco, but is taken outside the Heads and at the Farallone islands. The greater number of the examples I have seen are about 10 inches in length, but some attain a length of 18 inches or even more. This species may be readily distinguished from all the other flat-fishes found in our markets by the greater breadth of the space between the eye, which, in adults of 11½ inches in length, exceeds the half of the transverse diameter of the eye; by the form of the dorsal fin, the first rays of which, situated on the top of the head, are higher than those immediately succeeding them; and by the dark gray color, produced by black spots, just large enough to be recognized as such by the naked eye, upon a ground of a lighter tint. These black spots are not conspicuous in individuals just taken from the water, which are of a more uniform and far lighter color, but become so after a few hours exposure to the air. The interorbital space varies in width, apparently increasing with age, since in a specimen 7½ inches long it measured only one-third of the transverse diameter of the eye, and in smaller individuals is of still narrower proportions.

The number of rays in the dorsal and anal fins is also, as is not unusual among long-finned fishes, subject to considerable variation. Girard gives the formula of these fins as, "D. 78, A. 60;" while in an individual 10¼ inches long I counted 88 dorsal and 60 anal rays, and another 6½ inches long, had 81 dorsal and 61 or 62 anal rays.

The proportions of the body are also somewhat variable. A specimen 10¼ inches in total length, measured four inches in breadth, but most are of most slender proportions.

In the stomach of a specimen 7½ inches long, were the half-digested remains of two anchovies (*Engraulis ringens*).

For this species and another (*Citharichthys sordidus*) which is really widely different, as the eyes and color are on the left side, and the ventral fin of the colored side is placed upon the ridge of the abdomen. Girard instituted the genus *Psettichthys*, but after the separation of *Citharichthys sordidus* from it, the only characters left to distinguish *Psettichthys* from the older genus *Hippoglossoides*, were smooth scales, and the more anterior commencement of the dorsal fin. An examination of specimens larger than that from which Girard describes his species (4⅝ inches long) proves that the scales are not smooth, but ciliated, or set on the hinder edge with flexible spinules; so that this character disappears, and as the very slight difference in the point of origin of the dorsal is certainly quite insufficient to be reckoned of generic value, I have relegated it to *Hippoglossoides*, a second species of which genus is also found in our waters.

Hippoglossoides Jordani, nov. sp.—This species is tolerably common in the markets of San Francisco, but appears to have hitherto escaped description, probably on account of its considerable external resemblance to *Psettichthys melanostictus*, Girard; from which, however, it may be readily distinguished by the form of the dorsal fin, which increases toward the center, instead of commencing with rays higher than those immediately succeeding them (as is the case in the latter species) by the narrower interorbital space; and, still more readily, by the color, which is more uniform and lighter, the black points upon the scales, which are conspicuous to the naked eye in *P. melanostictus*, not being evident unless viewed with a lens. In large specimens the head has a reddish tinge. The largest I have yet seen measured 16 inches in length. In common with *P. melanostictus*, this species bears in the markets the name of "sole," and the fishmongers, who readily distinguish from each other most of the species of flat-fishes, do not appear to be able to discriminate between these. So far as I have been able to learn, it is taken outside of the bay, in the same localities with *P. melanostictus*.

In form of body, size, structure of the mouth, scales and lateral line, this species resembles the species previously mentioned; the distinctions between them are certainly only of specific value, yet they are perfectly constant, and a glance at the origin of the dorsal fin is alone sufficient to determine to which species an individual belongs. I have written a technical description of this fish for publication in the Proc. Phil. Acad. Nat. Sciences, and have taken the liberty to name it after the distinguished ichthyologist, Prof. D. S. Jordan, who has done more than any other American to increase our knowledge of the fresh-water fishes of the United States, and who is at present engaged in preparing an ichthyology of the United States, which will include the fishes of the Pacific coast.

Uropsetta Californica, Jordan; *Hippoglossus Californicus*, Ayres.—This species is not taken in the Bay of San Francisco, and is not by any means so common in the markets as *Psettichthys melanostictus*, *Citharichthys sordidus* or *Platichthys stellatus*. It may be readily distinguished from all our other Pleuronectids by the bold, abrupt arch made by the lateral line above the pectoral fin; by the presence of the eyes and color upon the left side; by its elongated, regularly ovate form; and by the shortness of the head. It is said to become more abundant to the south of San Francisco. This species was first described by Dr. Ayres under the name of *Hippoglossus Californicus*, or the Californian halibut, that industrious ichthyologist being of the opinion that it was congeneric with the true halibut (*Hippoglossus vulgaris*). Its affinities to that well-known species are recognized by the fishermen, who call it the Bastard or Monterey Halibut; but state that, compared with the true halibut, it is a tough, coarse fish. It is the largest of the flat-fishes of our waters, attaining a weight of from 50 to 60 pounds; the two largest I have yet seen weighed respectively 43 and 58 pounds, the latter measuring 4 feet 10 inches in total length.

A true halibut, probably identical with the European species, and far preferable to the present species as an article of food, occurs to the north of this State, and is quite abundant in Vancouver's island; it frequently attains a weight of 90 to a 100 pounds, and occasionally reaches 200 pounds. I have not as yet seen the true halibut in our market, although it is possible it may occasionally be brought there.

Small young individuals of the bastard halibut are frequently found on the stalls, and are sold under the name of "turbot," which is also applied to another species.

Citharichthys sordidus, Gunther; *Psettichthys sordidus*, Girard.—This species is brought in considerable numbers to the markets of San Francisco, and can be readily distinguished from every other kind occurring on this part of the coast, by the combined characters of eyes and color on the left side; lateral line almost perfectly straight; bony, ridge-like interocular space; and insertion of the ventral fin of the colored side upon the ridge of the abdomen instead of on the same level with that of the blind side.

As is the case with many other species, the number of rays in the dorsal and anal fins is not constant; two specimens obtained upon the same day had respectively D. 93, A. 76 and D. 95, A. 72; while an individual 12½ inches long, obtained on another occasion, had 98 dorsal rays.

In color, this fish is of a dirty yellow, or yellowish brown, with each scale margined with blackish, and the fins speckled with the same.

[Concluded next week.]

Saving Flour Gold.

The Boise *Idahoan* gives the following account of the Lane apparatus in use in the placer claims on Snake river:

From the gravel bank on which the hydraulic plays, runs a grizzly answering to the old sluice box, only instead of a solid wooden bottom, with riffles across, there is a sheet of perforated iron 21 feet long and four feet wide, the perforations nearest the gravel being smaller than those at the further end—the smallest holes are one-eighth of an inch in diameter while the largest ones are three-sixteenth of an inch. The grizzly is set on an incline and supported by legs of graduated length placed underneath. Below this is a proof-shaped platform with the comb running under the length-wise center of the grizzly. Covering this proof-like platform on both sides are the amalgamated plates, each of the upper tiers being 60 inches wide and 240 inches in length. Slightly underlapping these are plates 15 inches wide and 240 inches long, while still below are blankets, with a sand bag running underneath the edges. At the lower end of the grizzly, a tom, made of iron rods or bars is placed at a sharp angle, and under this nearly level trough is the last chance plate, with the sand boxes continued and meeting underneath its extreme edge in the shape of the letter Y, the stem of the Y constituting the sluice box for carrying off the tailings.

The plates are prepared by washing them with a weak solution of cyanide of potassium, and afterwards with quicksilver, when they are ready for service. The water is turned on the grizzlies and the dirt thrown in. The gold and heavy sand fall through the perforations of the grizzly, while the coarse gravel and unproductive dirt are swept by the water over the toms and thence into the sluice box, any stray particles of gold being caught on the last chance plate. A few inches above the plates is a protective grizzly, which breaks the fall of the sand. When the gold and heavy sand are received on the plates the sand is gently washed away over the plates and blankets into the sluice boxes and thence through the tail sluice, while every particle of gold is attracted and held by the quicksilver on the plates. An examination of the sand in the sluice boxes seldom reveals color, and then only when the quicksilver has all the gold it can hold.

Krupp's Electric Lamp.—A recent number of the *Engineer* gives a description and illustration of Krupp's electric lamp, which is said to work very well at Essen. It possesses the advantages of maintaining the ends of the carbon points in a fixed position, so that parabolic reflectors are used, and of regulating automatically the distance between the points. The upper carbon holder, which is quite heavy, is suspended from a disk by means of a jointed chain, while the lower holder is similarly attached to a disk, which is just half the size of the former. The chains are so passed around the disks, that, when the upper holder descends a certain distance, the lower holder will ascend half the distance, so that thus the difference in the rate of combustion of the positive and negative carbon is compensated, and the light occupies a fixed position. In order to regulate the motion of the upper holder a fan revolving in quicksilver is provided. A brake controlled by an electro-magnet acts upon a disk on the same spindle as the two holder disks, and thus regulates the distance between the two carbon points.

Cement for Fixing Metal Letters on Glass.—Copal varnish, 15 parts; drying oil, 5 parts; turpentine, 3 parts; oil of turpentine, 2 parts; liquified marine glue, 5 parts. Melt in a water bath, and add 10 parts dry slacked lime.

A German dealer in bird trimmings for ladies' hats has just received a consignment of 30,000 dead humming birds, 80,000 corpses of aquatic birds, and 800,000 pairs of wings.

Chinamen are not allowed to enter the new carbonate camp, Leadville, Colorado. Several celestials on their way there have been stopped and turned back.

DEWEY & COMPANYS'

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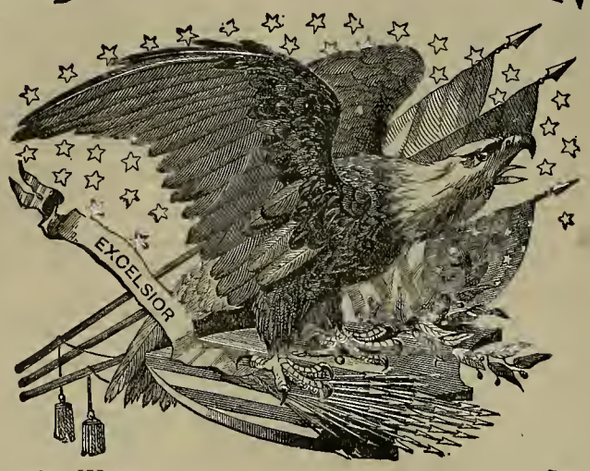

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While we cannot promise to labor any more faithfully or earnestly for our readers in the future than we have in the past, we shall endeavor to make the PRESS MORE COMPLETE IN ALL ITS DEPARTMENTS.

Its Editorials

Will be written by able and conscientious writers, and with such judgment and care as to render the journal of the highest usefulness to its readers, and to the permanent welfare of the new and progressive community its columns especially represent.

The Live Stock

Departments—including the horse, horned stock, sheep, goat, swine and poultry interests—will receive constant attention, and our researches for reliable information, which shall be of practical use to our Occidental readers, shall not be limited to any narrow sphere.

The Dairying Trade

Of this coast is yet in small dimension to what it might and should be—to what it is destined soon to be. Intelligent experience; careful experiments; the dissemination of demonstrated facts in regard to the best breeds of stock; information of the best grasses for pasturage for all seasons the best machines and methods for manufacturing; hints for marketing, etc., will be some of the subjects to be treated in an earnest way in our columns, that the RURAL PRESS may well to do its share in advancing one of the most promising industries of the coast.

Our Correspondents

Number some of the ablest domestic writers in the Union, and we are proud to say we would not exchange their co-operative pens for those of any other corps of newspaper correspondents. They are not only friends at heart of our paper, but of the true cause of progressive manhood and womanhood everywhere. The pursuit of

Floriculture and Horticulture

On the Pacific slope presents a field of delightful study, more prolific in novelty and fruitful in profits than awaits the student and laborer in any other portion of the globe. We trust to exchange valuable hints with our florists, vineyardists and fruit-growers throughout the Pacific States

Our HOME CIRCLE department will contain none other than

Chaste Literature

In pleasing variety, calculated to amuse, instruct and elevate both the young and old, boys and girls, who may turn to its columns for pastime and self-improvement.

Our Illustrations

Will be numerous and calculated to please the eye and help the mind to see quickly and correctly many important objects that might otherwise pass their knowledge. Some of them will enable farmers to see and contrast for themselves many kinds of new and important machines and implements. This illustrated feature of our paper, although expensive to its publishers, is an important one to rural readers—especially in a new and rapidly developing country.

The Mind and Health

Of the readers of the RURAL will be cared for in our GOOD HEALTH, USEFUL INFORMATION and DOMESTIC ECONOMY columns. Our GENERAL NEWS ITEMS, NEW INVENTIONS, SCIENTIFIC and MECHANICAL MISCELLANY articles will be continued throughout the year.

Agricultural Notes.

Under this head will be reported weekly, carefully selected and condensed items concerning the agricultural improvements and progress of the various counties and districts of the wide field we represent. The

Information of the Resources

Of this coast, set forth in the various departments of our paper, is not only of important benefit to its readers, but to every property holder on the coast, through the influence it exerts in stimulating enterprise at home and healthy immigration from abroad. There are but few persons interested in agricultural pursuits here who are not benefited annually by our publication above the amount of its subscription price.

Market Reports.

In its commercial departments, the RURAL PRESS will spare no effort to furnish the agriculturist an accurate and trustworthy schedule of the prices which various productions are gaining in the market. We regard this department of our paper as worthy of the most careful and discriminating labor. In our review of the markets we shall present all attainable information concerning the tendency of production of various supplies, and the features of the trade in them. We shall afford all the evidence which can be secured for forming true judgment of the features of agricultural trade and commerce. Although this is a difficult department, we shall especially strive to give the best weekly domestic produce reports in the city.

The Best is Cheapest.

We might fill our advertising columns with high-price

Quack and Swindling Advertisements,

And our reading columns with paid puffs, and thereby be enabled to furnish a large paper at a remarkably low price, but *we will not do it*. We believe our subscribers prefer a good paper at a reasonable price to the so-called cheap papers that trifle with their confidence. Time is precious and patrons will find that reading the cheapest which is most suitably prepared for their special avocation and locality.

A Farmer's Paper Throughout.

We repeat that the PACIFIC RURAL PRESS will continue to be a faithful advocate of the best and highest interests of agriculturists on this coast—according full justice to other kindred industries in conjunction with which agriculture alone can permanently thrive.

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No. 202 Sansome, N. E. Corner Pine St, S. F.

The Mining and Scientific Press.

THIS PUBLICATION, SO VALUABLE FOR MINERS, MECHANICS, SCIENTIFIC AND INDUSTRIAL MEN,

Is now in its THIRTY-EIGHTH Volume. It has ever been, and will continue to be, the aim and object of the publishers to make the PRESS

A Practical and Interesting Journal.

To this end, we aim, through the constant watchfulness of our editors and correspondents, to seize upon everything new in the way of mining and the various processes connected with the saving and separating of the precious metals, and to place the same before our readers at the earliest day. It has been well said that

A Newspaper is a Window

Through which men look upon all that is going on in the world. Our window is a special one, so placed and arranged as to bring within the scope of its vision all that is going on

In the World of Mining, Mechanics and Science.

Without a paper of this kind, the miner or mechanic is shut up in a small room or shop, and can know but little of what is going on in the world around him in relation to his particular calling. In this age of rapid progress books are necessarily slow and behind the times. It is only through papers devoted to the specialty which he has chosen that one can be easily apprised of the discoveries and improvements which are constantly being made by his fellow workers, and without a knowledge of which he soon becomes a laggard in the race.

The Value to the Community

Of such publications in disseminating important information, in checking useless and exploded experiments, and in instigating important enterprises, can scarcely be overrated. Through them the readings and observations of thousands are collected and collated, and brought directly to the shop or table of the reader without any effort of his own. For a mere trifle of cost he is regularly furnished with an encyclopedia of just the information he needs—an unbound book forever issuing but never finished.

Nowhere in the Wide World

Is such an aid more needed than by the miner of California. It is needed alike in the mill, in the mine and in the placer. We have here

The Largest Mining Field on the Globe,

Embracing a variety of minerals nowhere else found within the boundaries of a single field. We have here, also, men gathered from every quarter of the globe, bringing with them the collective wisdom of the world,

Useful, Practical and Directly from the Field

Of labor. The mustiness of books has been brushed away, and their minds are stored not only with the experience of the past, but also with the practice of the present. It is to this fact that we are indebted for our present

Able List of Correspondents,

Through whom we are able to promise to our readers so much that cannot be collected in the mere routine of office work. By the aid of such help our editors will be able, during the coming months, to do more than ever in furnishing information which shall be

Fresh, Novel and Interesting,

And which shall comprise all that is known of the latest and best means for saving gold and silver and for economizing labor and cost in that direction.

Our Illustration Department

Will still always form an important feature, and no effort will be spared to make it of the greatest possible local and general interest to our readers. The important matter of

Home Manufactures and Inventions

Will also largely occupy the attention of the publishers and editors, and will be constantly encouraged, as an important means of furnishing employment to those who are seeking our shores, and adding to the wealth of the Pacific coast.

The Large and Increasing Circulation

Of a journal thus devoted exclusively to useful and practical information, speaks more in our behalf than anything we could say of ourselves, and is an encouragement to its further increase, especially in these times of trifling and trashy journalism.

The class of readers who are interested in such a publication as this have no need to be any thing more than merely reminded that such journals are necessarily more costly than those of a lighter class, such as are read by the "million," and thrown aside as soon as read. Considering the character and location of the MINING AND SCIENTIFIC PRESS, our rates are as favorable as can possibly be afforded and do justice to the great industries in aid of which we are laboring.

SUBSCRIPTION—$4 a year, in advance. Samples free to those who will assist in obtaining subscribers.

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Scientific Press Supplement.

A MONTHLY BULLETIN OF PACIFIC COAST SCIENTIFIC REPORTS, RESEARCHES, ETC.

The aim of the publication is to gathor and present in a convenient and durable form all the valuable scientific matter practicable, in a publication specially representing scientific development in this comparatively new and rich field of observation and discovery.

It forms a select medium through which all sciontific writers on the coast may co-operate in publishing their thoughts and investigations to the scientific world in a befitting dress and manner.

It is well printed on good paper and furnished at the reasonable price of $1.50 por annum, postage paid. Single Nos., 10 cents. [Copies for extra circulation can be orderod in advanco for $5 per 100.]

It is issued in the early part of each month. Each number will contain eight or more pages.

The editors and publishors will aim to make such a publication as the scientific and progressive men of this coast will support cheerfully and take pleasure in sending to their friends and correspondents in all parts of the civilized world.

The SUPPLEMENT is an independent publication, and will not be mailed to subscribers of the "Mining and Scientific Press" unless paid for as a separate subscription.

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Office Mining and Scientific Press, No. 202 Sansome Street, San Francisco.

Single samples will be mailed from this office for 50 cents, postpaid. Wholesale and retail agents wanted.

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This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and explains the why and wherefore

It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus.

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This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery, etc., which alone are of the greatest value. PRICE, $7.50.

PROMPT AND SUCCESSFUL.—*Messrs. Dewey & Co:*—Gentlemen: Your Circular letter, 12th inst., informing me of successful termination of my applicatiou for patent received. Please accept thanks for the prompt and successful manner in which you have managed this business Yours respectfully, J. H. CAVANAUGH.
Walla Walla, Dec. 24th.

Look Out for a Good and Cheap Homestead on Easy Terms, Where Crops Never Fail.

READING RANCH,

Shasta Co., Cal.

Good Land!
Sure Crops!
HEALTHY CLIMATE!
Prices Low. Terms Easy.
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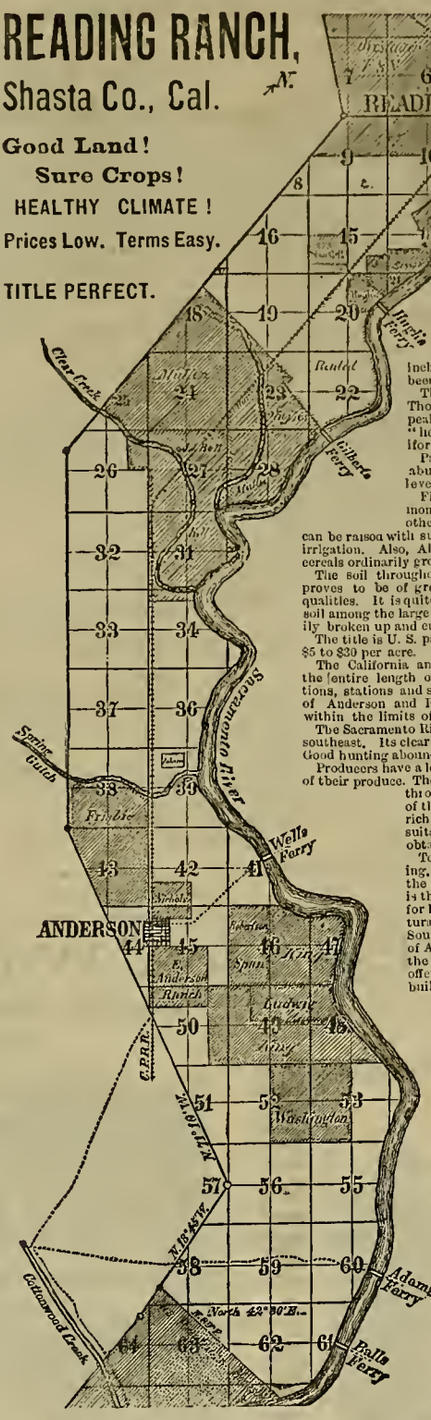

The Reading Ranch, in the Upper Sacramento valley, originally embracing over 26,000 acres of choice grain, orchard and pasture land, is now offered for sale at low prices and on favorable terms of payment, in subdivisions to suit purchasers.

The ranch was selected at an early day by Major P. B. Reading, one of the largest pioneer land owners in California. It is situated on the west side of the Sacramento River and extends over 20 miles along its bank.

The average rainfall is about 30 inches per annum, and crops have never been known to fail from drouth.

The climate is healthy and desirable. The near proximity of high mountain peaks give cool nights during the "heated term" which occurs in our California summers.

Pasturage, wood and good water are abundant. The tillage land is mostly level, with complete drainage.

Figs, Grapes, Peaches, Prunes, Almonds, English Walnuts, Oranges and other temperate and semi-tropical fruits can be raised with success on most of the tract without irrigation. Also, Alfalfa, Vegetables, Corn and all other cereals ordinarily grown in the State.

The soil throughout the tilled portions of the ranch proves to be of great depth and enduring in its good qualities. It is quite free from foul growths. The virgin soil among the large oak trees on the bottom land is easily broken up and cultivated.

The title is U. S. patent. Prices range principally from $5 to $30 per acre.

The California and Oregon railroad traverses nearly the entire length of the tract. There are several sections, stations and switches, besides depots at the towns of Anderson and Reading, all of which are located within the limits of the ranch.

The Sacramento River borders the whole tract on the southeast. Its clear waters are well stocked with fish. Good hunting abounds in the surrounding country.

Producers have a local market, which enhances the value of their produce. The railroad transportation route is level throughout to San Francisco. A portion of the land is auriferous and located near rich mines now being worked. Land suitable for settlers in colonies can be obtained on good terms.

Town lots are offered for sale in Reading, situated on the Sacramento river, at the present terminus of the railroad. It is the converging and distributing point for large, prosperous mining and agricultural districts in Northern California and Southern Oregon. Also, lots in the town of Anderson, situated more centrally on the ranch. Lots in both these towns are offered at a bargain, for the purpose of building up the towns and facilitating settlement of the ranch.

Purchasers are invited to come and see the lands before buying here or elsewhere. Apply on the ranch, to the proprietor,

EDWARD FRISBIE,
Anderson, Shasta Co., Cal.

P S.—Send postage stamp for illustrated paper containing information about Shasta county and these lands, and say advertised in this paper.

Location of Shasta County.

Shasta County lies not far from midway between the two most important ports on the Pacific shore, *i. e.*, San Francisco and Portland, Oregon, and directly on the overland route, which in the future will become the grand thoroughfare from Mexico to British Columbia. The town of Reading, at present, and probably for years to come, the head of railroad transportation on the California side of the mountains interveuing below Oregon, is distant from San Francisco by railroad (via Vallejo) 255 miles; from Sacramento City, 109 miles; from Marysville, 117 miles.

Several thousand acres of desirable Wheat, Barley, Oat, and other farming land for rent at a low cash rate or on shares. Crops never fail if sown by the first of March. Visit the premises or address as above. San Francisco Reference—PACIFIC RURAL PRESS Office, 202 Sansome Street.

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Notes on Shasta County and the Reading Grant.

The town of Reading, on the Reading grant, is situated at the present terminus of the Northern Branch of the C. P. R. R. It is a large and thriving place. Anderson is situated in the middle portion of the grant, surrounded by fine farming land. It is a substantial growing town, certain of a prosperous future.

The largest body of fine farming land is along the river from near Cottonwood to a point near Reading, embracing originally 26,000 acres, and known as the Reading grant. The different kinds of soil found in the county are well shown here. A portion of the grant is moist enough for summer vegetables or winter potatoes, the greater portion is the finest of wheat land, producing a crop every season; some of it is a red upland similar to the fruit lands of Placer county, and unsurpassed for orchards and vineyards Most of the bottom land of the grant is dotted over with white oaks of the largest size; there is little undergrowth.

Being away from any broad belt of settled lands, this fine tract, which possesses less drawbacks than nine-tenths of the farming lands of California, has seemingly had its merits overlooked. The purchases made upon the tract have hitherto been mainly by persons living in the mountains above.

Wood and water are plentiful and easy to get. Oak timber is in the majority. Good well water, unfailing in quantity, is reached in from 10 to 35 feet, according to location. The drainage is such that very little damage is ever done by the heaviest floods. All the surplus water drains off in a few days. Good roads for hauling extend all over the Reading grant. The situation of the grant is such that its future population can easily combine and furnish additional facilities for transportation by narrow gauge railroad and river navigation, if occasion should require.

For raising wheat, oats, barley, corn, beans, melons, beets, peanuts, sweet potatoes, flax, hops, all kinds of fruit, various vegetables, and in many places alfalfa, no irrigation is required. However, the opportunity for irrigating almost the entire tract of the Reading grant is most exceedingly favorable from the Sacramento river, or from Clear creek and other sources.

One of the advantages which the small farmer in Shasta has over his fellow farmers elsewhere, is in the fact that he has the monopoly of a very lucrative home market. The mines and lumber mills are constant consumers of all he can produce in the way of grain, hay, beef or pork.

The main valley and the lower hills are blessed with a healthy and invigorating climate. The mean summer temperature of Reading is 64° 14', or nearly 3° warmer than Livermore. The mean temperature for the coldest month is 46° 72', or 12' warmer than San Jose. These figures are taken from B. B. Redding's able report on the culture of the olive.

The two palm trees now growing in an orchard near Wiser's vineyard, two and a half miles east of Shasta City, were planted by Mr. Swazey, of Shasta, some 20 years ago. The largest is now 37 inches in diameter at four feet from the ground. The variety is that known as *Pritchardi filamentosa*. Young orange trees may be found in various parts of the county, several having borne fruit. At the Tower house are some of the finest walnut trees in the State, and choice orchard of all the standard varieties. Figs and peaches are of unusually good quality, and the winter apples keep from one to three months longer than the same varieties in the San Jose valley. Almonds have hardly been tested. The hard-shell is found everywhere, but only a few trees of the soft-shell can be found. The olive will undoubtedly succeed. Much of the fruit has been seedling, and little care has been taken of the orchards; but a better spirit prevails, and many trees are being planted. There is a fine field open for the first man who will grow small fruits, straw berries, etc., for the mines. A few are brought from Sacramento, but they arrive in poor condition.

In the matter of hay, the Reading market ranges from $18 to $24, and has been up to $30, the local supply not being large enough, and much has been brought from Tehama county. Some experiments with alfalfa, on both upland and lowland, have resulted favorably, and it appears that it will grow without irrigation, if the ground is deeply and well prepared..

The question of health is of so great importance that we made particular queries on this point. Healthier people than Shasta county furnishes are not to be found anywhere, nor is there any malaria along the Sacramento within the county limits.

The advantage above all others which is just now turning the attention of stockmen, small farmers and orchardists to Shasta county is in its abundant and unfailing rainfall.

The local market has hitherto taken all the hogs raised, at good figures, about five and one-half to seven and one-half cents live weight. This all goes into the mines and some pork is even brought from Tehama and other points south.

On the whole the advantages of this county, are, first, diversified interests; second, local and increasing markets; third, healthfulness, rainfall, fine scenery, etc., and its development is only a question of time

"Visit this section of our State and see for yourself," is good advice, which can be regretted by but few, if followed by those who wish to settle on the Pacific coast from other parts of the Union, or by those who wish to change their location in California.

UNITED STATES
Mineral Land Laws, Revised Statutes
AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Surveys; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of $500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, postfree, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,
Publishers of the MINING AND SCIENTIFIC PRESS, S. F.

Acknowledgement and Thanks.

LAKEPORT, Lake Co., Cal., Nov. 2d, 1878.

MESSRS. DEWEY & CO.—*Gentlemen:*—I hereby acknowledge receipt of patent, for which please accept my sincere thanks. When I have any further business in this line I shall certainly employ you. With kind regards, I am, Yours very truly, CHAS. SLATTERBECK.

Jackson's Agricultural Machine Works,

S. E. Corner 6th and Bluxome Sts., San Francisco.

To Practical Threshermen
— AND —
FARMERS!

GENTLEMEN: — The undersigned having removed his Machine Works, established in 1872, known by the name of Yolo Planing Mills and Machine Works, from

Woodland to San Francisco,

And erected a larger and convenient Factory, with all of the facilities necessary to manufacture a complete Threshing Outfit, respectfully solicits your patronage.

If you have any new ideas you wish to develop, inventions you wish to introduce, or alterations and improvements you wish to make on your old Machines, please bring them to my Works, and I will give you the benefit of my large experience with experimental Threshers, and do your work at the

LOWEST RATES.

Every Thresherman and Farmer on this Coast feels and knows of his own knowledge the want of a more economical Threshing Outfit. One that is less wasteful, less expensive in annual repairs and running expenses, and the first cost within the reach of the small Farmer. With the view of supplying this want and producing a Machine especially adapted to this Coast, I have established the JACKSON AGRICULTURAL MACHINE WORKS, and respectfully solicit suggestions and opinions and the patronage of the practical Thresherman and Farmer, and offer you my best attention and skill. Also to the inventor I offer my services, and solicit your patronage. Will make experimental Machinery to order, and will manufacture meritorious patented Machinery on royalty, or purchase the patents on reasonable terms.

Address all communications,

BYRON JACKSON,
S. E. Corner of 6th and Bluxome Streets,
SAN FRANCISCO, CAL.

Jackson's Patent Feeder,
FOR THRESHING MACHINES.

The Feeder is adapted to either Steam or Horse-Power. Will feed mowed Grain or Mustard, no matter how long. Headed or reaped Grain, no matter how weedy.

It will thresh cleaner than by hand feed.

It will save the labor and board of one man (on large Machines two), besides it will do more work and better work, as it never gets tired.

The Elevator.

The Elevator in the New Machines is attached by a knuckle shaft, and driven by a mitre gear from the Feeder. All journalled in one solid box-banger, with gears neatly covered from the dust and straw.

Both Feeder and Elevator are driven by one large pulley, fitted with a friction clutch to stop and start the Feeder at the will of the operator.

The whole arrangement is so simple, compact and durable, that the additional machinery added by its use can be no objection, when compared with the great advantages gained.

1st. Room to spread the feed.

2d. Less danger from the forks, or of being knocked into the cylinder.

3d. Getting away from the dust.

4th. Getting the Separator away from the stacks.

5th. Time saved in setting.

6th. Saving the foreman the annoyance of crawling under the Separator to set it, or running around the stack to communicate with the engineer.

7th. The Engineer can see everything connected with the Machine, or crew, thus avoiding many accidents.

8th. The sacks can be piled on either side of Separator.

9th. The opportunity of using a low derrick table. The importance of this low table cannot be overestimated. It saves the three main items in the harvest field: TIME, LABOR and GRAIN.

Address

BYRON JACKSON,
Southeast Corner 6th and Bluxome Streets,
SAN FRANCISCO, CAL.

JACKSON'S
Improved Portable Derrick.

(Patented January 23d, 1877.)

This consists of four upright pieces, framed in two sections to stiffen the uprights, and fastened together at the top with one heavy bolt, and two of them hinged at the bottom, so that one section will fold inside of the other and lie down smoothly on the table.

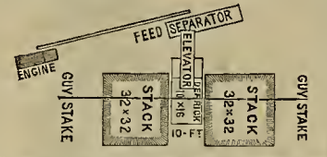
The Derrick, when in working position, is light, and very stiff and strong, and does not require taking down to move, except to pass under obstructions, or for conveniences on long journeys.

Two Guy Ropes only are required to hold it while at work. The top and bottom pulley blocks are each hung with swivels to prevent chafing the ropes.

The Derrick can be put on to any platform, and will be sold separate if desired. Price, $50.

The advantages of this Derrick are: convenience, durability, lightness, strength and absolute safety.

The tablemen stand between the uprights, and it is impossible to hit them with the Forks, so they lose no time in watching the Forks to keep from being hurt. Price, $30; Derrick complete with blocks, ropes and two forks, $175.



The above diagram shows the proper position for the Derrick, Separator and Engine when using the Feeder and Elevator, and the proper size and shape of stacks.

This plan is much better than stacking the same amount of grain in one stack 35x60, and using the Derrick on one side.

These sizes are the largest I think profitable, because the Forks cannot be pulled over 30 feet, and supply a Self-Feeder with two Forks. If the straw is short, they had better be smaller. Address

BYRON JACKSON,
S. E. Corner of 6th and Bluxome Streets,
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JACKSON'S
Light-Weight Fork.

Is only half the weight of the Clumsy Forks now in use, and yet Stronger and more Durable.

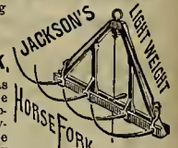
It is neatly constructed of a light frame. The head formed of two pieces, one each side of the frame. The tines passing through them and the several pieces of the frame, locking the frame firmly between them, and by means of a light iron brace from each tine to the frame. The strain in lifting the load is brought to bear straight with the grain of the wood in the several pieces of the frame, having no twisting strain on any portion of the Fork. The two head-pieces serving only to space the tines and stiffen the frame. The latch spring is protected so that it never fails to do its work.

The bail is so protected by the frame that it is not subject to being bent out of shape, and is made very light.

In short, this Fork is constructed upon common sense scientific principles, *and every ounce of weight left out that is not needed, weighing only 35 to 40 pounds, while those now in use weigh from 60 to 75 pounds.*

It is marvelous that men will use and be satisfied with so clumsy and heavy an implement, when one so remarkably lighter can be as easily made. Let us estimate the saving per day by the use of the Light-Weight Fork, basing our calculations on 1,000 loads per day to supply a Thresher, 20 feet the average distance to move the grain, 30 pounds the difference in weight of the Fork. Thirty pounds moved 20 feet 1,000 times equals 30,000 pounds moved 20 feet each day; or, in other words, 30 pounds dragged at the end of a rope four miles in addition to a hard day's work in the hot sun. This is a low estimate of the practical saving by using

JACKSON'S
Light-Weight Fork,



It is an old saying that it was the last straw that broke the camel's back, and it is very applicable in this case. By leaving off the last 30 pounds in the weight of the Fork and giving it the proper shape, plenty of men can be found to operate it at reasonable wages. Address

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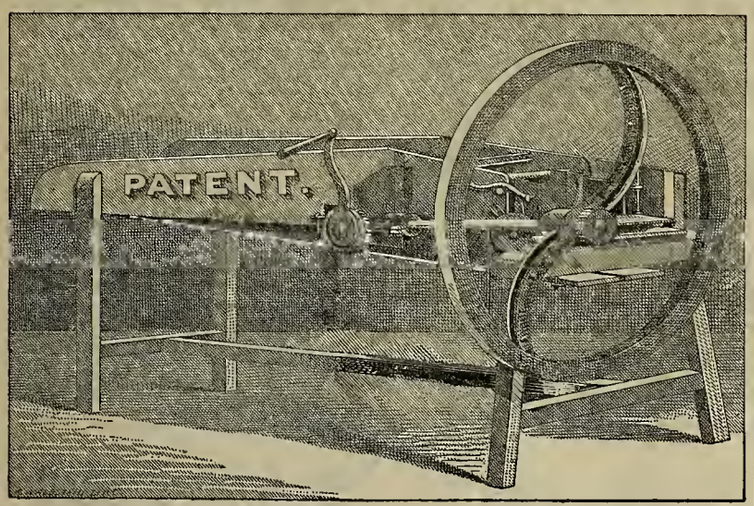

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The attention of Farmers, Dairymen, Stablemen, Etc., is called to the

CALIFORNIA PATENT HAY CUTTER,
THE BEST EVER INVENTED.

The advantages of this Machine over others are as follows: 1st. Simple and durable. 2d. Does first-class work in the shortest possible time. 3d. Can be kept in repair without the assistance of a mechanic. 4th. Cuts different lengths by a simple method of adjustment. 5th. Price compared with other first-class machines very low.

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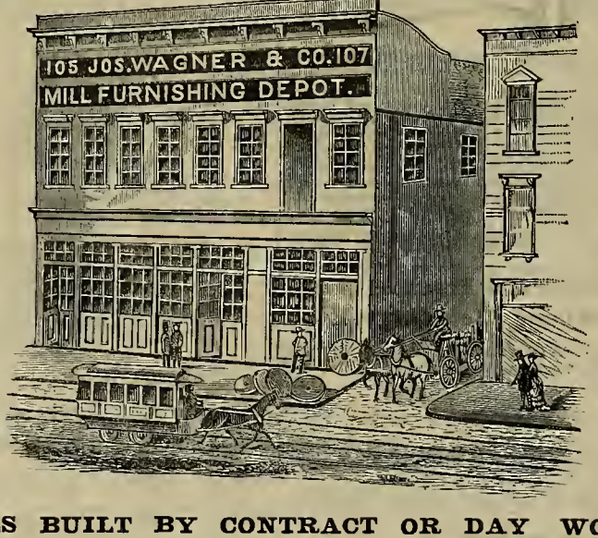

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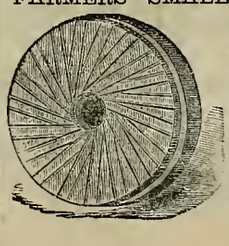
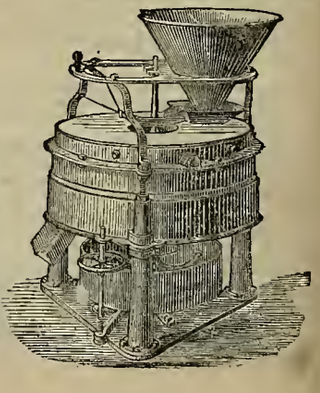
BOLTING CLOTHS MADE UP.

FARMERS' SMALL FEED MILLS,





And all styles of Mills for farming purposes constantly on hand, and also Coffee, Spice, Salt and Paint Mills. Especial attention paid to getting up Mills for Pulverizing Ores.

Eureka Smut Machines, Bran Dusters, Rubber and Leather Belting, Conveyor Flights, Mill Irons, Spindles, Bails, Drivers, Steps, Regulating Screws, Silent Feeders, Pulleys, Proof Staffs, Hoisting Screws, Bails and Pins, Plaster, Etc. Mill Picks, Mill Picks dressed, Mill Stones repaired and rebuilt.

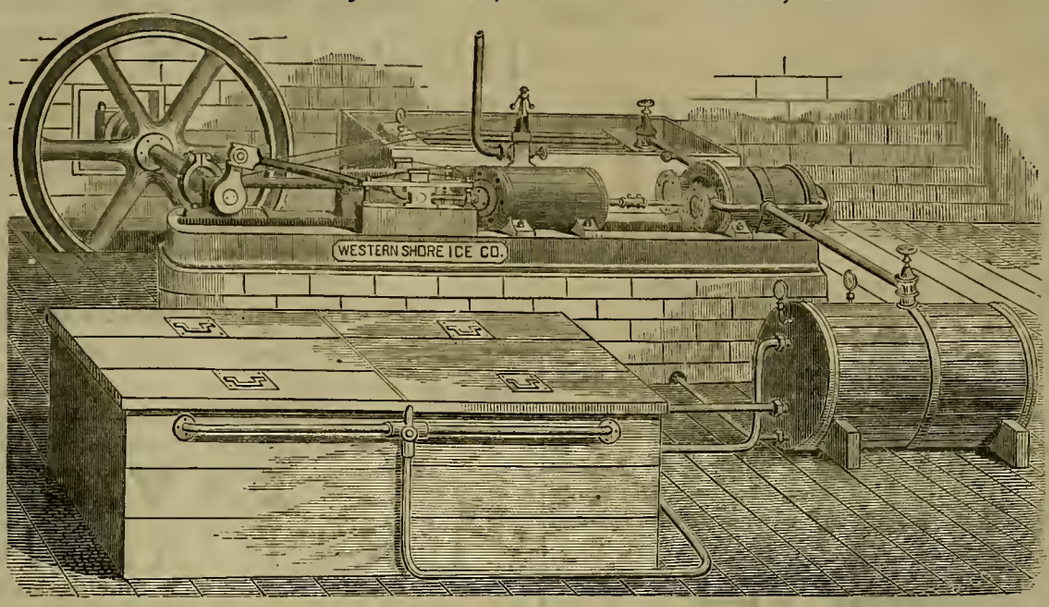
Mill Stones balanced.

THE WESTERN SHORE ICE COMPANY.

821 Battery Street, San Francisco, Cal.

This Company having acquired from H. J. West, of London, the sole and exclusive right to manufacture and sell on the Pacific Coast his world renowned ICE-MAKING AND REFRIGERATING MACHINES, are prepared to supply the same to Hotels, Restaurants, Clubs, Breweries, Country Towns and all manufacturers and consumers of Ice on this Coast.

A one-ton Machine will manufacture clear Ice in blocks of any desired thickness, from three inches to four feet and upwards, at a cost of *one-quarter of a cent per pound.* A twenty-ton Machine will manufacture the same description of Ice at a cost of *one-twentieth of a cent per pound.* In cases where power is already on the premises, the cost of manufacture will be less than one-half of the above figures. These Machines have obtained the First Class Prize Medal at the Great Exhibition in London of 1862; the Prize Medal at the Vienna Exhibition of 1873; and supplied Ice at the late Paris Exposition. Many valuable improvements have been recently made, and they are now acknowledged to be the most complete and economical Ice-Making Machine in the world. Apparatus has already been constructed under these patents, which is now in successful operation in Great Britain, India, and New York, equivalent to the manufacture of a *million pounds of Ice daily.*



The accompanying drawing illustrates one of the patent transparent block-ice making Machines manufactured by the WESTERN SHORE ICE COMPANY. To this apparatus a very plain and simple Steam Engine is attached for working the Air-Pump. This is made direct-acting, by which means the use of all belts or gear-wheels is avoided. Where, however, a separate motor exists, the Machine may be had without the Steam Engine, in which case there is of course a reduction in the cost.

Patent Refrigerating Apparatus.

BREWERIES.—The eminent success which has attended the introduction of this patent apparatus is ample proof of its great superiority over every other known invention of the kind. The most eminent brewers in the world, including Allsop & Sons, Truman, Hanbury, Buxton & Co., and Guinness & Co., have adopted this system, and have eleven of these Machines of the largest kind in use, while 38 of them are employed in various other Breweries in Great Britain.

Among the various other purposes for which this new patent machinery is valuable, are the cooling of air or liquids, preserving meat, fish, vegetables, fruits, etc., cooling Hospital Wards Theaters, Dairies and for all purposes where a low temperature is desired.

The WESTERN SHORE ICE COMPANY are prepared to supply Refrigerating Machines of a capacity for cooling from 50,000 to 500,000 cubic feet of air per hour to 30° Fahr.

For circulars and particulars as to prices and any other information desired, apply to the Secretary of the

WESTERN SHORE ICE COMPANY,

No. 821 Battery Street, San Francisco, Cal.

☞ ALL MACHINES SOLD WILL BE ACCOMPANIED BY A GUARANTEE. ☜

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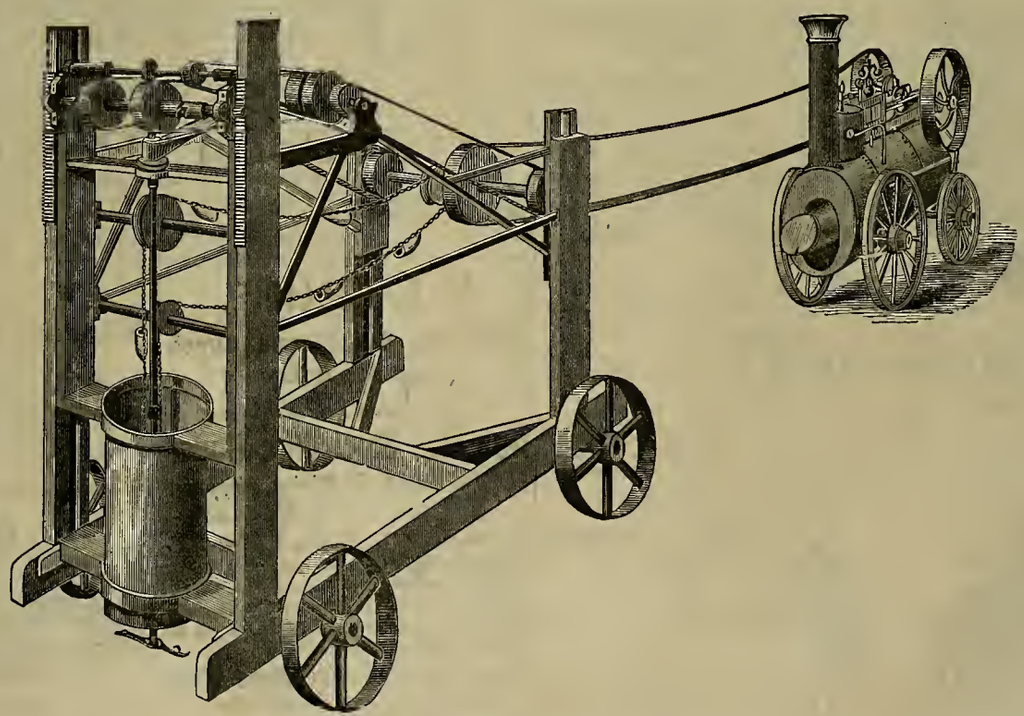

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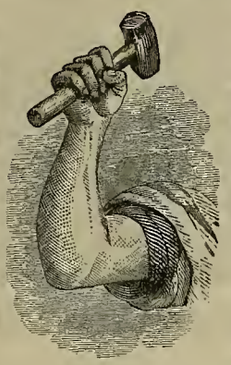
Having no Connection with the Iron Combination, and being under obligation to no one, we are prepared to make it for the interest of all wanting Goods in our line to give us a call, promising them good treatment and LOW PRICES.



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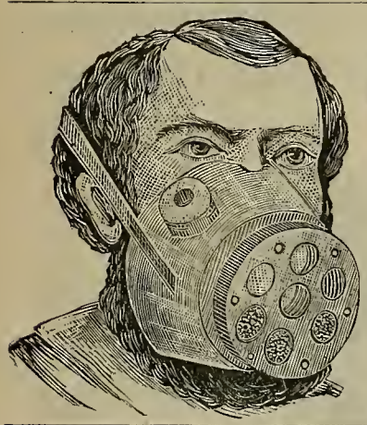

— PATENT —

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Prevents Lead Poisoning and Salivation.

INVALUABLE to those engaged in Dry Crushing Quartz Mills, Quicksilver Mines, Guano Works, White Lead Corroding, Feeding Threshing Machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and if not satisfactory the price will be refunded. Price $3 each, or $30 per dozen. Sent post-paid to any address upon receipt of price

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W. T. EASTERDAY.

ESTABLISHED 1867.

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Iron Planers, Boring Mills, Centering and Tapping Machines,

UPRIGHT DRILLS,

With Geared Heads, Automatic Feed, quick return to Spindles; Multiple and Lever Drills; Blacksmith and Carriage Makers' Drills; Post Drills to run by hand or power. Radial Drills, Suspension Drills with geared head, Automatic Feed.

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Unrivalled for Durability, Safety and Power.

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MANUFACTURERS OF

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HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 (XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

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Stronger, Better and Safer than any other High Explosive.

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IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

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Barbed Fence Wire.

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BRASS CASTINGS of all kinds,
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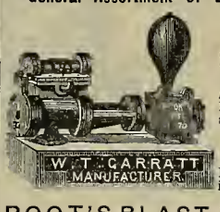

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ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

Dewey & Co { 202 Sansome St. } Patent Ag'ts

Arizona.—No. 3.

[Written for the Press by W. H. S.]

The Big Bug Mining District

Is located about 25 miles southerly from Prescott. It is reached by a good road down the Agua Frin, called the Black Canyon road, thence by a side road to Big Bug creek and mines.

This creek runs nearly east nud west. The principal mines in this district are situated on the south side of a range of mountains that run along the north side of Big Bug creek, in what may be called an open canyon, which is easy to reach with loaded wagons at all seasons of the yenr by the road I have described.

Those mines nre peculiarly well situated on account of their necessihility nnd the proximity of wood and n fair supply of water obtainable for most parts of the year from Big Bug creek, a runuing stream heading in the mountaius at the upper end of the cauyon, where there is heavy pine timber in abuodauce both for mining purposes nnd general use. It is the intention of Prof. Cherry, who is opening some of the old mines here and developing new oues in the interest of Chicago parties, to put iu a saw mill to cut lumber, not only for their own use but also for the general market. He also expects to have a 10-stamp gold mill at work on these orea in a short time.

The principal mines centering upon Big Bug creek are the Eugenia, Orion, Middlesex, Wormsers, Pride of Big Bug nnd Rock Island, which are on one continuous ledge proapected and worked to some extent for 9,000 feet. This may he called the npper ledge, on the south side of the divide already mentioned, of the range north of the creek. Lower down nnd nearer the creek is another ledge runniog parallel to the upper one, and plainly traceable for 8,000 feot. On this ledge nre located the Mny and Grace, Amity, Isabella, Isabelln Extension, Luella and Crown Point. Higher up, but still on the southern slope and a little to the east, will he found the Big Bug mine, St. Ursula, Oversight, Vulcan and Ironsides. The St. Ursula seems to be a continuation of the Big Bug ledge, the others apparently parallel ledges. Over the divide, on the north side of the range, are located the Ticonderoga, Independence, Galena and Dividend. These are all gold mines, and the Big Bug, Eugenia, Orion, Amity and Isabella, have been worked to a considerable extent and a large amount of bullion taken out. The Big Bug ore assumes some peculiar forms, running into a very dark color nearly as black as anthraeite coal, and abounding in beautiful quartz crystals and iron cubes. The Vulcan is an iron-capped mine and abounds in copper and froe gold. The Rock Island shows a strong ledge of white quartz, but has not been opened to any great extent. The mines on the lower ledge are of decomposed quartz permeated with iron stains. In fact iron, in various forms, is a prominent feature in most of these mines.

Still further north, where the range drops away into the valley of the Agua Fria, are located the Kit Carson, Silver Flake, Silver Belt, Ida May, Agua Fria and Agua Fria North. The engraving will show the location of the principal mines.

These are all silver mines. The Silver Belt is opened by a shaft to a depth of more than 100 feet, and hy several drifts on different levels. The vein is small, but rich in sulphurets and born silver, and stroog io galena. The ore is being worked nt the Agua Fria smelter, about three miles from the mine, where plenty of water is obtainahle at all seasons of the year. Most of the other mines of this group have been well opened, but little or nothing is being done upon them at present. Both sides of the divide nppear to be seamed with mineral-bearing veins, their generai direction heing northeast and southwest.

The mines on Big Bug creek were operated during the era of Indian hostilities by Hitchcock & Gray, and to illustrate the enormous expense incurred in working them at that time, it is said that 35 cents n pouud represented the average price charged for everythiug in the nature of supplies, whether it was flour, beans or baeon. A ten-stamp mill which they built there cost them, I was told, $75,000. A better one could be put there to-day for less than $10,000. The miners in those days were kept constantly on the alert by Indian raids, and many a bold pioneer and venturesomo prospector met his death at the hands of the wily savage and now sleeps in somo nameless grave on mountaiu side or iu deep canyon. They were brave, hardy men, the advanco guard of civilization, and little thought they would so soon bo followed by the stago coach and mail, then by the railroad with its drawing-room cars and the telegraph with its lightning messages, opening up these rough and rugged hills and isolated valleys to all the world.

DIAGRAM SHOWING THE LOCATION OF SOME OF THE MINES OF BIG BUG DISTRICT, ARIZONA.

Truth to Home Seekers.

The telegraph has been laden during the week with accounts of n widespread movement among the blacks in aome of the Southern States toward the prairies of Texas and Kansas. Inspired by the idea which has been industriously promulgated that in the new States they would be much more happily and prosperously located, these ignorant nnd poor negroes have taken up an hegira from their old homes and throng all avennes of transportation through Arkansas and Missouri. They are moving hy the thousands, and most of them are so poor that they can but half make the journey they intended. Homeless and hungry they have filled St. Louis, unable to go farther, unable to return, unable to live where they are, save by the hand of charity. The spectacle is a sad one to contemplate. The South is robbed of her needed lahor element; the West is not enriched by a legacy of paupers. Mistakeo, misguided, doubtless imposed upon by some heartless people who had money to make from land sales or transportation, this throng of Africans has lost one home without gaining another, and the homeless ones are a burden to themselves and to the places into which they have come.

This is an aggravated case of unfortunate spread of emigration fever. It is comparatively easy to start the disease. Glowing descriptions, unqualified promises, visions of El Dorados inspired hy printed accounts or voiced by hired speakers, will stir an old established community to its foundations, and as the venturesome spirit rises it impells to motion hoth those who should and those who should not move. It is a matter of great moment to many fellowmen. No one who has a spark of humanity will engage in any movement which carries its points by propagation of rose-colored and partial statements, calculated to excite people from happy and prosperous homes. There is only one true way to present the claims of any part of the footstool which it is desired to populate by emigration from the older settlements, and that is to set forth the exact truth. No desirability of location and natural advantages is so pure that it has no qualities of less or opposite character. No success should be described without due connection of the price and effort at which success is attained. No skillfully painted picture which conceals the rough natural objects from the landscape is true to art; rather is it the triumph of the artist to depict these, that nature's balance of the rough and the smooth way be maintained. Thus it is with truth. Let us have it absoluto. Let it present the facts of a location or an industry as they exist. For men's affairs are much na nature's work; both have their favor and disfavor, their sun and storm, and he who represses either from his representatiou is false to himself and an enemy to his fellowmen. In such matters do not let self interest crush the humanity out of man. It is a serious thing to influence a fellow-being, and he only can do it with a clear conscience, if he have a conscience at all, who makes whole truths his instruments, and truth itself his guide. This is true, even in the passing events of a day's importance, and a thousand times more true when applied to matters which may turn the course of lives. A home, to him who has one, is too happy and important a thing to unsettle, unless the act is done with full view of the probabilities which the change involves.

And this question, fortunate for it in this gold-struck age, has other grounds than those of abstract morals and humanitarism on which to urge its claims. It is plain from the experience of all new communities that those incomers are most valuable who arrive with temperate views of local advantages and full confidence that success is a thing to be labored for. These are the men who meet their payments for lands, who surround their homes with valuable improvements; in short, build up the community in permanent growth and increase. The wild, the visionary, the volatile, caught by the glare of roseate representations, fade and vanish before the test of actual and persistent endeavor, even in situations where endeavor ripens fruit most quickly. Sorry indeed it is for them that they were ever tempted from the confines of their native towns. But oot alooe those naturally volatile and visionary are caught by the unscrupulous persuader. Earnest, honest men are often led to sacrifice a measure of prosperity in order to obtain promised fullness, but which they fail to reach because they cannot surmount the difficulties of the task under new conditions. These men too had better been spared the change, and often full truths would have dismayed and discouraged them from fruitless undertakings.

Reduction Works for Sale.—An advertisement in another column announces that the Melrose Reduction Works are offered for sale. These works were erected at considerable expense. They lie beside the track of the Central Pacific railroad, and are consequently very accessible. The property is worth the attention of any who wish to invest in this line.

Buffalo Ranches.—Now that it has been shown that the wild buffalo can be domesticated and made as servicable as the ox and the cow, a Black Hills paper suggests that the Yellowstone and the Big Horn valleys be used as reserves for raising these animals.

Present Aspect of the Quicksilver Question.

The combination proposed for restricting the California product of quicksilver, referred to by us a few weeks since as having been about perfected, seems to have failed of a final consummation. The scheme however without being abandoned, remains *in statu quo*, with the chances in favor of its being ultimately carried out At the time alluded to every considerable company in California was understood to have given in their adherence to the plan except one, whose active representative was then absent from the city. On his return this party, contrary to general expectatiou, declined to come into the arrangement, thereby necessarily causing its further postponement, a single large company refusing to co-operate being sufficient to render the scheme inoperative. One of the reasons assigned by this party for holding aloof from this association of producers was, that there were then many lots of quicksilver being held by outside parties in London, and which, the moment any advance in prices occurred here, would be at once thrown upon the New York market, supplying the Eastern demand to the exclusion of the California product. This objection, which seemed well taken at the time, has since been deprived of its force, these second-hand lots having lately been about all cleared off, leaving the Rothschilds, as aforetime, sole masters of the London market.

Notwithstanding we see it stated that these merchant princes have agreed to lay down this article in New York free of expense, at £6 per flask, scarcely 39 cents per pound, there is little doubt but they may be induced to co-operate with these California compauies in an effort to save the business from ruinous or even profitless competition. In this view of the sitnation the chances for bringing about some concerted action looking to that end are certainly greater. Under ordinary circumstances the Rothschilds have a practical monopoly of this metal on the other side, the Spanish government having mortgaged to them the product of the mines of Almaden for 30 years, 21 of which remain unexpired. Under this agreement the minimum price to he received by the government is £6 per flask. How then the purchasers are to deliver it in New York at that figure will be a puzzle to the mercantile mind, inasmuch as they must be out of pocket hy the transaction to the nmount of commissions, freight and insurance, at least. This is not the way the Rothschilds are apt to do business, forciug us to conclude that there must be some mistake in regard to the above statement.

Never as yet has the price of quicksilver fallen as low as £6 in the London market, the lowest quotations, at least for many years past, being £6 17s, which figures ruled for a portion of 1868-69. For a long time the London and San Francisco markets have been in such close sympathy as to warrant the belief that they can, with a little good management, he maintained in harmony instead of becoming antagonistic to each other. Being duty free the prices at which this commodity has sold here and in England have corresponded very nearly throughout a long series of years. The rates at which quicksilver can profitahly he made in this State and at Almaden, the principal mines in Europe, do not greatly differ; for while they have at the latter cheaper labor and richer ores, we enjoy the advantage of more mines and a large home market. As the large companies in California and this English house virtually command the quicksilver markets of the world, it is altogether likely that they will be able to agree upon a policy which, while it keeps the demand fully supplied, will save themselves from dead loss.

At a late meeting of the Bullion club, in New York, Col. Dean expressed the opiuion that the leading managers on the Comstock had knowledge of the existence of three valuable ore bodies recently developed on that lode.

Barlow J. Smith. M. D.

Consulting Physician,

Professor of Phrenology and Mental Hygiene.

Proprietor of the Smithsonian Medical and Phrenological Institute, 635 California Street, above Kearny.

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Mrs. Dr. Smith as Matron has charge of the female bathing department.

DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHŒAL, or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or verebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

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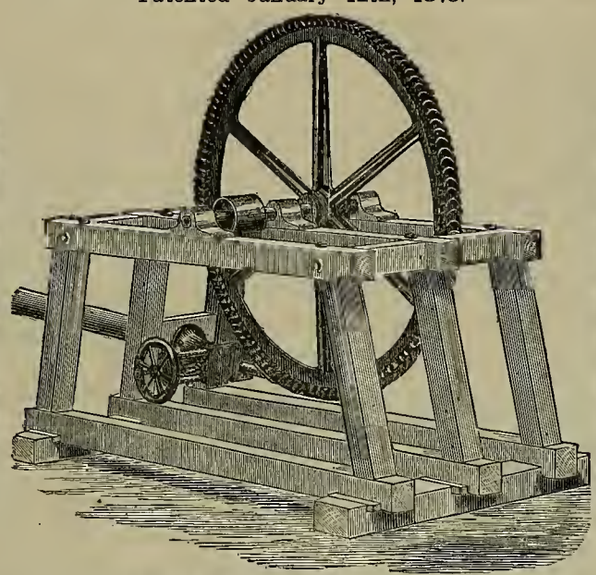

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1–Four and one-half foot wheel, running Bunker Hill Mining Co.'s Mill, Amador county, Cal.; 10 stamps. John Palmer, Supt.
1–Six-foot wheel, running St. Patrick's Mill, Nawcastle, Placer county, Cal.; 15 stamps. Jno. Towussnd, Supt.
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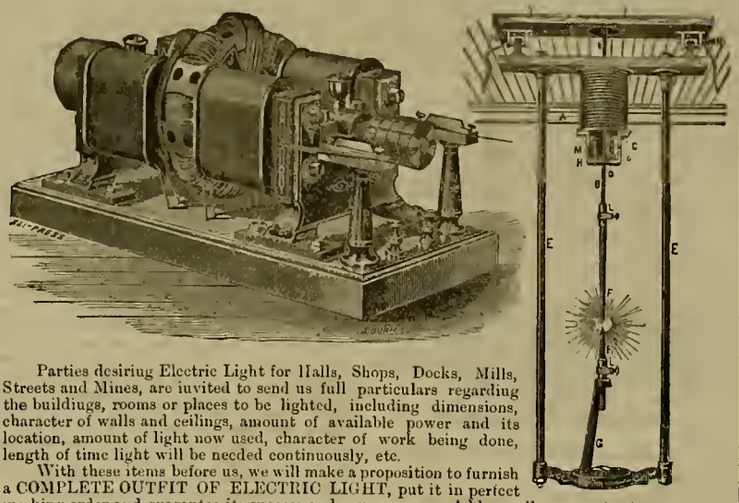

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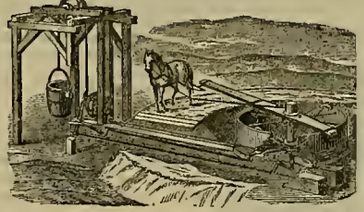

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The Prospector's "Wee Pet" Assayer, (Patented)	100 00
The Testing Machine for Gold, Silver, Lead, etc	40 00
The "Little Wonder" Self-calculating Sample and Button Weigher, (Patented)	25 00
Blow-pipists' Pocket Laboratory of Tools, Fluxes, etc.	50 00
Vest Pocket Blowpipe	3 00

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Assaying and Testing Taught.

Mine Wanted.

The advertiser is prepared to purchase a *good* California Gold mine; gravel or quartz. Must be in a condition to be examined and prospected.
Send full particulars, description, location and price to "MINER," care of Chas. G. Yale, Esq., editor of the MINING AND SCIENTIFIC PRESS, San Francisco, Cal.

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[Continued from page 229.]

per ton. The Daily tunnel, which is about 75 ft above the last named, in perpendicular hight, is 150 ft in length. Commencing at a point 125 ft from the mouth of the adit, J. M. Daily & Co. have leased 100 ft of ground running in a westerly direction. Twenty-five ft of this have been opened by the continuation of the adit, and thus far the explorations have resulted highly satisfactory, showing up from two to eight inches of ore on the south wall, and a smaller and less continuous streak on the north wall. The mineral consists in part of solid galena with copper pyrites and some gray copper, the remainder being decomposed, and carrying malachite and sulphurets of silver. The ore on the north wall runs 188 ounces, and that on the south wall carries 482 ounces of silver per ton without classifying. Thirty-five ft back from the breast of the drift is a cross-lode thought to be the Joe Reyno'ds No. 1. This has been opened a few feet, and carries some rich ore, but not sufficient to warrant its exploration while there is better ore in sight in the main drift. Kramer, Wilson, Stevens & Davis, who have raised up from the O'Connel tunnel, are now stoping within 15 ft of the Daily tunnel on an uncommonly fine body of ore. For a distance of 50 ft there is a continuous vein of solid mineral from three inches to a foot in width. The bulk of the ore is bright fine-grained galena, carrying copper pyrites and gray copper. Since this pocket was encountered no runs have been made, but it will not mill less than 400 ounces per ton. The Discovery tunnel is being run in under contract, and at present shows but an unimportant quantity of low-grade mineral in the breast, which is 200 ft in. This ground is leased by Kennedy & Daily.

IDAHO.

Salmon River.—*World*, April 4: The mines on Killikinick creek are producing some rich ore, which will be shipped to market as soon as the snow melts sufficiently to permit it. The Hood and Beardsly mines, in Bay Horse district, are also producing a large amount of ore of a medium grade, and the famous Ram's Horn mine, in the same vicinity, keeps up its reputation as a rich ore-producer. They are down 50 ft on the Vermont mine and from developments already made, this property proves to be a veritable bonanza. Part of the ore will average from $70 to $80 in silver and gold; and to 18 inches to two ft of the vein will assay from $350 to $900 per ton in gold and silver.

Other Notes.—Danskin & Co.'s placer claims, on Granite creek, have been put in good shape, and are probably piping by this time. The Belshazzer company are at work running a tunnel to connect with their shaft. They have about 60 ft to run yet, but in case water does not trouble them, will make the connection in a month or six weeks. Good rock has been taken out of the Ebenezer mine during the winter. The Granite Creek Ditch company have water through their lower ditch and to Placerville in the upper one. Their claims at Placerville and Granite creek are all running. Several other claims in that vicinity are also running.

MONTANA.

Jottings.—Helena *Independent*, Mar. 27: At the Centennial mill, the proprietor, Mr. John C. Rainsford, has just increased the amalgamating capacity of the works by the addition of another large Newell pan to the two previously at work in the pan room. Next week the Centennial battery will be increased to double its present number of stamps by the erection of five more, for which the mortar is already in place. The Centennial is at present employed on ore from Mr. Boardman's claim on the Original lode. At the Boardman claim, on the Original, the main shaft was furnished with a cage, an improvement which greatly facilitates the hoisting of the 20 tons of ore taken out every day. The shaft is 186 ft deep. At that depth a level is run to the vein, which is found to be base and of rather low grade, as was the case with the Alice ore at that distance below water level. At 100 ft from the surface, the first adit crosses the ledge, where it is found to be 22 ft wide. At this point it carries free-milling ore, of which the first class ranges up to 150 ounces per ton. This claim is provided with steam hoisting works, a wire cable, ore cars, and everything else needed for its speedy and economical working.

OREGON.

Mining Items.—*Sentinel*, April 2: The Coyote Gravel company are working night and day with a full force, and the ground indicating big pay. Every claim on Jackass is being worked with plenty of water, and the yield of gold in that district is good. The Squaw Lake company are still cleaning and repairing ditch, but will soon be at work, and will have a full head all summer. The Grand Applegate company is still busy at work on their ditch and expect to be ready for washing in a month. At Palmer creek the boys are piping night and day with two shifts. They only expected to test their mine, but will now have a paying run. John Meldrum is making $10 per day ground sluicing at Steamboat. There are about 30 men at work in that district, including Chinese. Tom Kahler, Fort Lane, cleaned up last week, his claim paying $10 per day to the hand. The late heavy storm will give him a new start. Star Gulch mine running night and day with a full head of water. From appearances in the ground sluice this company will make a good clean-up. Bybee, Hawkett & Co. are crowding the gravel with two pipes, and the former has gone down the river to enjoy the yellow appearance of the sluices. The English company and the Blue Gravel company, on Galice creek, are both running with a full force and water enough for double the number of pipes.

UTAH.

Bingham Items.—Salt Lake *Tribune*, April 6: A jigger has been put in operation on the Winnamuck slag dump. Sufficient water could not be had to run a wheel, and the next best thing had to be resorted to. Mr. Mullett conceived the idea that the cayuse might be utilized. A horizontal wheel, 10 ft in diameter, with an attachment similar to that of a whim, has been erected. The revolving of this wheel by the use of a horse, furnishes the motive power to run the jigger. Work so far by this process gives entire satisfaction. The boys of the Caledonia mine have recently struck a fine body of high-grade ore in the upper tunnel. The Argonaut company have started work on their placer ground, and, although very little snow fell during the past winter, sufficient water is to be had for hydraulic purposes.

Silver Reef.—On the Buckeye Reef operations continue active. Litigation, with its attendant evils, retards work on several of the best mines, but in the Buckeye, Last Chance, Stormont and others, development is progressing without interruption. The Buckeye is working a full complement of men, and supplies the mill with more ore than it can separate, necessitating the addition of more stamps and pans. Messrs Branham, Potter, and Day, owner, manager, and Superintendent, respectively, are fully alive to the requirements, and before long extensive additions to the milling facilities may be expected. The Last Chance is working 50 miners, and under the management of live and practical men, is returning handsome dividends. Vigorous working on the Stormont has been resumed, and many chloriders are engaged in delving for the precious metal. The Barbee mine is developing finely; the ore body seems to be permanent and richer than ever, and is mined in such quantities as to tax the capacity of the mine to the utmost.

The work on the *Jeannette* is proceeding slowly at Mare Island, as a general survey is to be held on her when she goes on dock.

An unsuccessful attempt was lately made at San Rafael to release from jail the convicted murderer, William Dever.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the Mining and Scientific Press, DEWEY & CO., Publishers and U. S. and Foreign Patent Agents.]

By Special Dispatch from Washington. D. C.

For the Week Ending March 18th, 1879.

213,368.—Neck Yoke—L. E. Ainsworth, Vermilion, Dakota Territory.

213,373 —Ore Feeder—D. H. Anderson, S. F.

213 309.—Pump - W. T. Wilcox, S. F.

213,399.—Bit Stock—L. C. Di Bert, S. F.

213,386.—Vehicle Spring—O. S. Carville, S. F.

213 382.—Apparatus for Obtaining Metallic Copper from its Solutions—C. C. Bitner, Spenceville, Cal.

213,400,—Wagon Brake—J. F. Ditsworth, Austin, Nev.

7,120 to 7,124 inclusive.—Candles—Trademark — W. T. Coleman, S. F.

7,125 —Clothing—Trademark—Heynemann & Co., S. F.

7,112.—Candles—Trademark—Castle Bros., S. F.

7,114.—Cathartic Medicine—Trademark—E. DePrati, San Francisco.

7,109.—Canned Salmon—Trademark—J. W. & V. Cook, Clifton, Ogn.

——The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Safety Lamp.—David Lubin, Sacramento. Dated, Mar. 11th. This consists in a novel construction of an elongated reservoir for oil or burning fluid of any kind, said reservoir being tubular in form and coiled in a spiral of one or more coils in any desirable manner, whereby a sufficient quantity of oil may be held in a compact but at the same time separate and extended form. This spiral may be made in a plane or may be in the form of a flat cone, or in any way to allow the oil to flow from the center to the outside. The feed cup and wick cup are provided with interchangeable wire gauze safety protectors to prevent the ingress of foreign matters, and insure safety from explosion. The exterior of the reservoir connects by an S or V curve with the wick portion or chamber, which is situated outside the spiral so that the light will not be shaded by a large reservoir. The whole is mounted upon a suitable stand, and from the shape of the reservoir it will not be possible to spill any large quantity of the oil by upsetting. Being formed of gas pipe or other strong tubing it cannot explode. An oil reservoir at the bottom of the curve serves to retain any overflow or drops. The whole lamp, reservoir and all, may be made in a single piece, and in several different forms. This lamp is specially useful in factories, machine shops, mines and such places where explosion or fire would do much damage. The lamp is strong and durable and not easily injured. Its construction is such as to prevent explosion.

Lock. — Nestor A. Young, Healdsburg. Dated, Feb. 25th. This is an improvement in construction on keyless locks, and is especially adapted for use in padlocks. This invention is an improvement on a patent granted to W. R. Young, November 27th, 1877, and consists in a novel construction of an outer case having an internal spindle or stem, which is formed on one piece with the outer case, and serves as a guide or center for all the tumblers, but the outer one and driver, from which they are independent. This latter is secured to the closing plate which also forms the dial disk, and the inner flange of this driver fits against and is steadied by the end of the stem upon which the tumblers turn. The closing plate is securely locked in place by means of a loose disk, which has lugs upon its edge so arranged as to be turned into corresponding slots on the inner edge of the case, and when in place it is locked, and prevented from removal by means of the bolt or staple when it is in place.

Axle and Axle Box.—Edgar E. Lincoln, San Jose. Dated March 11th. This invention relates to a novel construction and method of uniting axles and axle boxes so that the inventor is enabled to reduce the size of the journal to very small proportions. It is rendered perfectly dust-proof and easy to lubricate, and the space which the box occupies reduced within the hub so that the mortises for the spoke tenons may be extended to near the center, thereby greatly strengthening the important points, while the construction prevents any oil or lubricant from finding its way from the journal to the interior of the hub to loosen the spokes.

Car Brake.—Albert Waymouth, Livermore, Alameda Co. Dated, Mar. 11th. This invention relates to an improved mechanism which is designed to be applied to the cabooses or cars which make up the rear ends of heavy trains, and it is of special value on those roads having steep gradients when the rear end of the train sometimes become detached from the forward portion, in which case the rear cars run backwards down the grades, thus causing serious accidents. This invention is designed to remedy this defect, and consists in the attachment of an automatic brake apparatus, which shall act in one direction, while it allows the car to run freely in an opposite direction. A clutch is mounted on the axle of the car and is so connected with the brake bar as to act when the car attempts to run backwards, in throwing on the brakes, locking the wheels and stopping the car.

The Clover-Seed Fly, a new Insect Pest. At the annual meeting of the N. Y. State Agricultural Society, held at Albany, in January last, J. A. Lintner, of the State Museum of Natural History, read a paper in which—among other injurious insects recently observed—he gave an account of the larvæ of an insect which had been discovered two years ago in several localities in eastern and northern New York, hidden within the seed-pods of the red clover, (*Trifolium pratense*) and destroying the seeds. The perfect insect had not yet been seen, but the examination of the larva show it to belong to the *Cecidomyidæ*, and in all probability very nearly allied to the wheat-midge, *Cecidomyia destructor*. A description of the larva was given under the name of *Cecidomyia trifolii* n. sp. The range of this insect's depredations or the extent of its ravages was yet unknown. In some localities in the western counties of the State of New York, the clover was so infested with it last year that it was worthless for seed. It is believed that the not infrequent failure heretofore reported of the clover-seed crop throughout the country, which has been ascribed to imperfect fertilization of the blossoms and various other causes, has been the result of the secret operations of this little insect.

Wages are from $3.50 to $4 a day at the Snake River mines, but there is room for few to find employment.

A strike of laborers took place in San Francisco recently and for a time threatened serious trouble.

The mushroom season has commenced in the vicinity of Chico and a Chinaman was the first victim.

The first crop of flax on the island is now growing at Belle View, Tulare county.

The Western Union lines are to be extended from Bodie to Benton.

Quicksilver Mining.

Memoir on the Mines and Works of Almaden, by M. H. Kuss, M. E. Translated from the "Annales des Mines" for the Mining and Scientific Press, by S. B. Christy.

CONTENTS. — Part I.-Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Constitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines Part II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. Part III.—Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. Part IV. -Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

Submarine Nail-Driving Device.—The U. S. Naval authorities will soon give Wm. Stack's device for driving nails under water an official test at Mare Island. Mr. Stack is a resident of Oakland, and secured his patent through this office It is shown in the illustrated advertisement of this issue.

An Engineer, favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design stationary, marine, locomotive, mill work, sugar and hydraulic machinery. Speaks Spanish. Unexceptional references. Address Expert, this office.

Kustel's Concentration of Ores (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams, 1867. The most complete treatise. Published at this office. Price, $7.50. Postage, 50 cents extra.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

How to Stop this Paper.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Examine the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Goble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

M. D. Shrader is now an authorized agent of the Pacific Rural Press, also Mining and Scientific Press, to solicit subscriptions and receive the money for the same His receipts given for such money will be duly honored by this company.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

Wednesday m., April 9, 1879.

BAGS—Jobbing.	
Eng Standard Wheat.	9 @ 9½
Neville & Co.	
Hand Sewed, 22x36..	9 @ 9½
24x36	—@—
23x40	11 @—
Machine Swd, 22x36.	9 @ 9½
Flour Sacks, halves....	7¾@ 9½
Quarters	4½@ 6
Eighths	3½@ 4
Hessian, 50 inch	12½@13
45 inch	7¾@ 8½
40 inch	7½@ 8
Wool Sacks,	
Hand Sewed, 3½ lb..	— @45
4 lb do	50 @52½
Machine Sewed	45 @—
Standard Gunnies	13½@14
Bean Bags	7 @ 7½
CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits,	
2½ lb cans	2 00 @ —
Table do	3 00 @ —
Jams and Jellies..	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box..	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef,	
2 lb, doz	4 00 @ —
do Beef, 4 lb, doz.	6 50 @ —
Preserved Mutton,	
2 lb. doz	4 00 @ —
Beef Tongue	6 50 @ —
Preserved Ham,	
2 lb, doz	6 50 @ —
Deviled Ham, 1 lb,	
doz	5 50 @ —
do Ham, ½ lb doz.	3 00 @ —
COAL—Jobbing.	
Australian, ton..	8 00 @— —
Coos Bay,	6 50 @ 7 00
Bellingham Bay.	6 50 @— —
Seattle	6 00 @ 6 50
Cumberland	14 00 @— —
Mt Diablo	4 75 @ 6 00
Lehigh	13 50 @— —
Liverpool.	7 50 @ 8 00
West Hartley...	10 50 @— —
Scotch	10 50 @— —
Scranton	11 50 @— —
Vancouver Id...	7 00 @— —
Charcoal, sack...	75 @— —
Coke, bbl	60 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manila	17 @— —
Ground, in cs...	25 @— —
FISH.	
Sac'to Dry Cod..	4½@ 5½
do in cases..	5 @ 6
Eastern Cod	— — @— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls..	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1,	
Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden	
Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz,	
bbl	1 25 @ 1 50

Cement, Rosendale	2 00 @ 2 25
Portland..	4 00 @— —
NAILS.	
Ass'ted sizes, keg	2 90 @ 3 00
OILS.	
Pacific Glue Co's	
Neatsfoot, No 1.	1 00 @ 90
Castor, No 1	1 10 @ —
do, No. 2	1 05 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	72 @ —
Boiled	75 @ —
Cocoanut	55 @ —
China nut, cs	70 @ 72½
Sperm	1 40 @ —
Coast Whales	40 @ —
Polar	45 @ —
Lard	90 @1 00
Oleophine	22 @ 22½
Devoe's Bril't	22 @ 23½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	37½@ —
Elaine	37½@ —
PAINTS.	
Pure White Lead.	8 @ 8½
Whiting	1¾@
Putty	4 @ 5
Chalk	1¼@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb..	5 @ 5½
Hawaiian	7 @ 7½
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	10 @ 10½
Common brands..	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	45 @ 50
Cassia	22½@ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal., ½ lb glass	1 50 @ —
SUGAR, ETC.	
Cal. Cube, lb	11½@ —
Powdered	11½@ —
Fine crushed	11½@ —
Granulated	11 @ —
Golden C	9½@ —
Cal. Syrup, kgs...	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

Wednesday m., April 9, 1878.

Iron.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
Copper.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ 2
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask..	9½@— 10
Nails.—	
Assorted sizes	2 90@3 00

LEATHER.

[WHOLESALE.]

Wednesday, m., April 9, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 60
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 15 Kil	55 00 @70 00
Cornellian, 12 to 15 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	51 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lh	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lh	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Rus set Sheep Linings	1 75 @ 4 50
oot L egs, French Calf, pair	4 00 @— —
BOood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
eather, Harness, lb	35 @ 38
LFair Bridle, doz	48 00 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	18 @ 21
Wax Side	17 @ 60

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, April 9, 3 p. m.

Silver, 1½@1¾.

Gold Bars, 890@910. Silver Bars, 8@19 ℘ cent. discount.

Exchange on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 88½@89.

London Consols, 97; Bonds, 103.

Quicksilver in S. F., by the flask, ℘ lb, 40@41c.

LUMBER.

WEDNESDAY M., April 9, 1879.

CARGO PRICES OF REDWOOD.		PUGET SOUND PINE RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 00	2d quality	25 00
Refuse	18 00	Battens	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	**REDWOOD. RETAIL PRICE.**	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 8, 1879.

HIGHEST AND LOWEST BAROMETER.

Apr 2	Apr 3	Apr 4	Apr 5	Apr 6	Apr 7	Apr 8
30.079	30.052	29.954	30.211	30.090	30.142	30.228
30.014	29.926	29.848	30.104	29.961	30.064	30.151

MAXIMUM AND MINIMUM THERMOMETER.

64.8 / 53.7	63.7 / 54.8	62 / 56.3	62 / 52.8	65 / 57	65 / 50	07.8 / 47

MEAN DAILY HUMIDITY.

70.3	72.6	73.3	70	68	64.3	63.6

PREVAILING WIND.

W	W	W	NW	SW	SW	W

WIND—MILES TRAVELED.

166	139	213	242	162	259	191

STATE OF WEATHER.

Fair.	Fair.	Fair.	Fair.	Cloudy	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

	.03	.11	.30	.10	.07	

Total rain during the season, from July 1, 1878, 20.76 in.

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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
J. W. A. WRIGHT.—Tulare, Fresno and Kern counties.
S. V. BLAKESLEE—Northern California.
H. E. HALLETT.—Stanislaus and Merced counties.
G. W. MCGREW.—Santa Clara county.
RICHARD ALLEN.—British Columbia.
JOHN MICHELS.—New York and adjoining cities.
M. D. SHRADER—Alameda County, Cal.
JOS. DIMMICK.—Sonoma and Napa countiss.
HENRY R. EWALDT.—Arizona Territory.
JOS. WASSON.—Mono County, Cal,
L. P. MCCARTY.—Amador, Calaveras and Tuolumne counties.
MILTON KENNEDY.—Tulare County.
R. E. BUSH.—Nevada County, Cal.
MILT. D. WILLIAMSON.—San Joaquin county.
J. W. HAMM.—San Joaquin county.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Mount Jefferson Milling and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors held on the 21st day of March, 1879, an assessment (No. 6) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 318 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 2d day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 27th day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

California and Oregon Land Company.—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 2) levied on the first day of March, A. D., 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Allen, J O	130	400	$100 00
Pond, E B	120	50	20 00
Parks Bros., Trustees	133	250	100 00
Parks Bros., Trustees	134	250	100 00
Parks Bros., Trustees	135	250	100 00
Parks Bros., Trustees	136	250	100 00
Woodrum, O P	100	100	40 00
Woodrum, O P	107	100	40 00
Woodrum, O P	108	100	40 00
Woodrum, O P	109	100	40 00

And in accordance with law, and an order of the Board of Directors, made on the first day of March, 1870, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Saturday, the tenth day of May, A. D., 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine street, San Francisco.

Summit Mining Company.—Location of Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	38	700	35 00
Edwards, J E	39	700	35 00
Gautier, Gustave	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1870, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1870, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.
Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

POSTPONEMENT.—The sale of delinquent stock of the above named Company is hereby postponed until Tuesday, the Sixth day of May, 1879, at the same hour and place. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.
Office, Room 6, No. 318 Pine street, San Francisco.

Union Stone Company.—The Regular Annual meeting of the Union Stone Company of California for an election of a Board of Directors (to act as Trustees) to serve the Company for the ensuing year, and for such other business as may properly come before the meeting, will be held at the office of the Secretary of the Company at 237 First Street, San Francisco, California, on Tuesday, April 8th, 1870, at 11 o'clock A M.

R. F. KNOX, Secretary.
San Francisco, March 20th, 1870.

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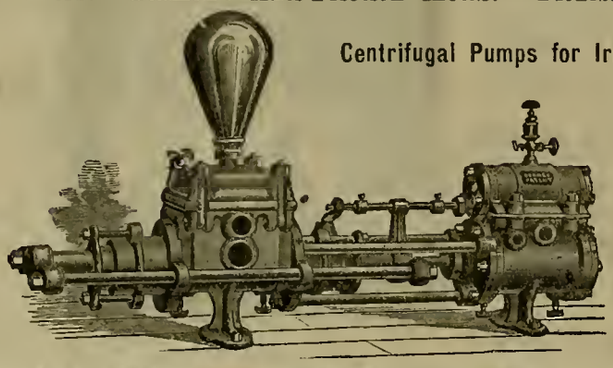

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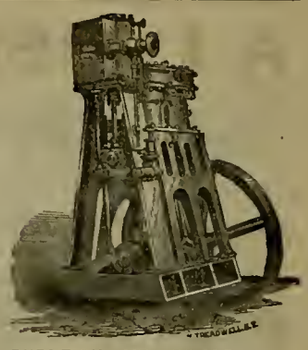

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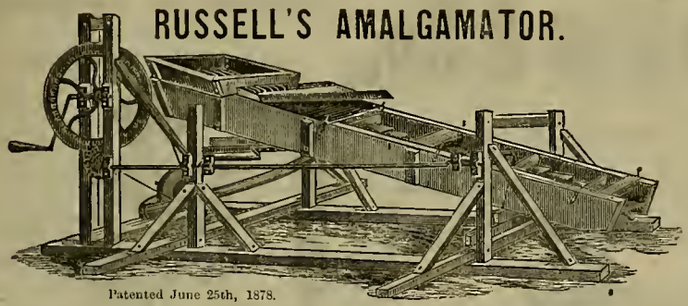

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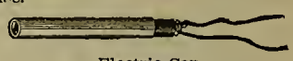

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Which allows tamping without danger. They can be fired by any caps now employed in blasting, but the use of these is always dangerous with any Powder, and the loss of the throwing power resulting from lack of tamping renders it with our Powders doubly objectionable.

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Equal to the best in the market, will be supplied at the lowest market prices.

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LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature, thus,

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Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

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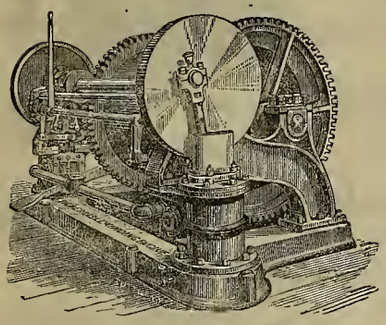

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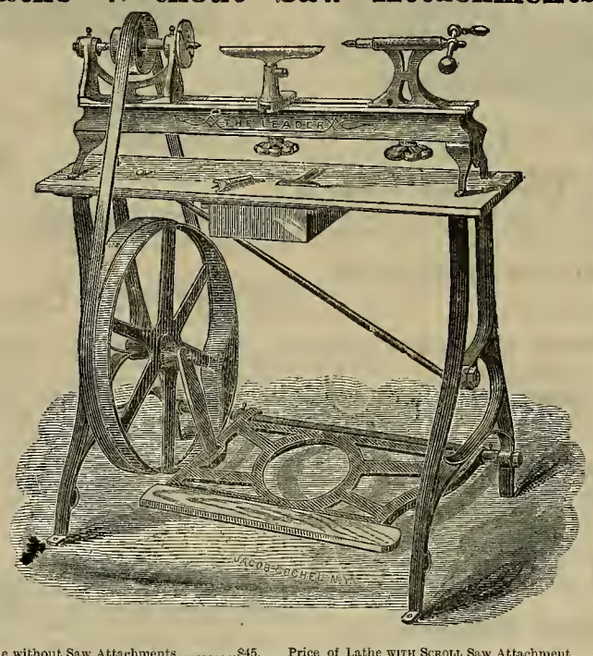
Nos. 107, 109 & 111 Front Street, S. F.

Lathe Without Saw Attachments.

This Lathe has been made especially to meet a want felt by many for a really good and substantially made Foot-Lathe at a reasonable price, and we think that we can safely say that it is by far the best Lathe ever placed on the market at the price asked. The bed, head, and tail stocks are of iron; the spindles of steel. The bearings of the head stock is conical, so that the wear can be easily taken up.



Material eighteen inches long and eight inches in diameter can be turned on it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face-plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
Price of Latbe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.

Chuck, for drills ⅜ and under, Price.....$1.50
Chuck, for drills ½ and under, Price.....$2.25

They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*

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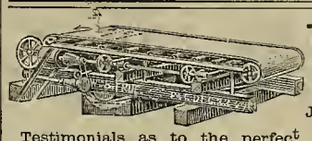

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SUBMARINE BUILDERS.

WILLIAM STACK, of Oakland, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an apparatus for driving nails or spikes under water, an engraving of which is here shown. It is well-known that it is extremely difficult to drive nails or spikes under water, even if it is only submerged a few inches. These difficulties are completely obviated by Mr. Stack's device, which has been put in thorough practical operation in the construction of wharves and slips in the Oakland side of the bay.

Fig. 1 shows the application of the device, and Fig. 2 shows the construction. *A* is a metal tube of suitable length, the foot of which may be serrated as shown, so that the points will engage with the wood when the tube is pushed or driven against it. The rod or driver, *C*, has a recess or cavity, *D*, at the lower end so as to rest on top of the nail or spike shown in Fig. 2. Where the tube, *A*, is pushed against the timber in the desired position, the spike or nail is dropped in at the upper end and slides down against the timber. The rod, *C*, is then slid down on top of the nail, and by alternately drawing out and forcing the rod into the tube, the rod serves as a driver; or by hammering on the upper end of the rod the nail is driven into the wood. The tube answers both as a guide for the nail and driving rod. The tube can also answer as a guide for a screw-driving device on the end of the rod, by which lag screws may be put in place under water as well as nails. Of course the tube may be set in any position desired, so that nails may be driven at an angle if necessary. The appliance, as simple as it is, will be found very useful in many cases for bridge building or similar purposes. Address

WM. STACK,

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, APRIL 19, 1879.

VOLUME XXXVIII Number 16.

The First Ominous Note from Snake River.

Already there is over-crowding, idleness and suffering on Snake river. The consequences that usually attend the *stampede* have not failed, it seems, to wait on this, the most recent of its kind. The forebodings of ill have begun to be realized even earlier than was expected. That destitution and disappointment would come to these adventurers in due time was of course forcseen; hut it was hardly thought that they would come so soon. Satisfied, from the glowing accounts of these mines that filled the papers off that way, that a prematnre and ill-advised movement of this sort would be likely to ensue, we took occasion several months since to cantion the mining community against this danger. But when were miners ever known to pay due heed to admonitions of this kind? Neither experience nor warniug avails to restrain them from rushing away to the most distant locality once the rumor of a new find, especially if it be placer diggings, reaches their ears. We had suspected from the late less confident tone of the Idaho and Salt Lake papers, when speaking of Snake river, that the emigrants to that region were hardly meeting with the success that they had heen encouraged to look for; and now from very authentic sources of information we are sorry to hear tbat such has really been the casc.

To the courtesy of Col. Isaac M. Taylor, who hae just returned from a visit to the Salmon River country, where he went to examine certain mines for San Francisco capitalists, we are indebted for some fresh and reliable news from the Upper Snake. The bars along that portion of the river contain, as we stated in an article on the subject last week, less gold than those further down. The country there is also higher and colder, in consequence of which the miners have been prevented from getting to work as soon as they expected. Very little gold has therefore been taken out, hut few claims being worked and these paying less than was anticipated. Instead of yielding from $10 to $15 per day to the hand, tbey have not, as yet, yielded half these rates. Meantime, claim holders are without the means for outfitting their claims, or are prevented from doing so by the cold and stormy weather, while hundreds of men swarm along the river, scarcely any of them able to get employment, the most of them being without snfficient money to get away, very many without even enough to huy a meal of victuals. In this dilemma some had already started on their return, walking out of the country, the railroad heing nnwilling to carry any without payment of full fare. Wages at the mines are nominally $1.50 pcr day, though enough men can he had to work for a dollar, and even for their board.

This region of country is settled by the Mormons, and consequently low prices prevail; these people, who huilt the narrow-gauge railroad from Ogden to Snake river, having worked for 75 cents per day. On the river all claims worth taking up are located, leaving newcomers no chance to get ground without huying it. It costs a good deal to outfit a claim, as either a ditch has to be dug for some distance, or a current wheel put in for getting water upon it. Even where recourse is had to the latter expedient the expense is considerable, lumber costing not much less than $100 per M. by the time it is got on the ground. The merchants at Blackfoot, present terminus of the railroad, informed Col. Taylor that they regarded the whole business as hardly better than a humbug, expressing the opinion that the diggings in that vicinity would not pay on an average more than two or three dollars per day to the man. Further down the river they will no doubt prove more remunerative, but even there everything is taken up, leaving no chance for men who go in now to get a claim by location, while the opportunities for obtaining work are probably no better than they are up about Blackfoot and at points further up. In view of the foregoing statements, a man's industrial condition must be desperate indeed if he could hope to improve the same by emigrating to Snake river.

Our Deep Mines.

Tho exploratione on some of the mines in this country are fast approaching the greatest depths reached in the long-worked mines of the old world. For example, the Belcher shaft, on the Comstock, has now reached a perpendicular depth of 2,680 feet below the surface, being within 600 feet of the depth at which the Adelbert, lead-silver mine in Austria, is now being worked, and which is accounted the deepest mine in the world. It should be stated that in estimating the depths of the various shafts sunk on the Comstock, it is the custom to make the measurements from the top of the Gould & Curry croppings, the so-called *datum* line for all vertical measurements made along the lode. Starting from this level the Belcher shaft would bave a depth of 3,093 feet. Among the Comstock mines the Yellow Jacket shaft is now 2,500 feet deep, the other mines there, as regards depth, standing in the following order: Con. Imperial, 2,367; Savage, 2,350; Con. Virginia and California, 2,326; Chollar, 2,421. At the bottoms of most of these shafts are inclines rnn at various angles and to greater or less depths, the Yellow Jackct's new shaft being the deepest perpendicular opening on the Comstock, its bottom heing now nearly 2,400 feet below the surface. There are not in all Europe perhaps a dozen deeper mines than these on the Comstock, only one or two being found in England. Besides those above enumerated, there are several mines on the Comstock that have been opened to depths varying from 1,500 to 2,200 feet. As the deep workings on this lode are nearly all being driven actively downward, we will soon be able to point to a numher of deeper mines in this country thau exist anywhere else in the world. As the extreme deep mines of Europe are being worked for coal or ores of low grades, it is not prohable that they will be opened to much greater depths than have already been reached; whereas, the leading Comstock companies will push explorations to twice their present depths, extracting ore, should they find it, and continuing the search to the lowest levels it is possible to reach, should they fail to do so.

FIG. 1.

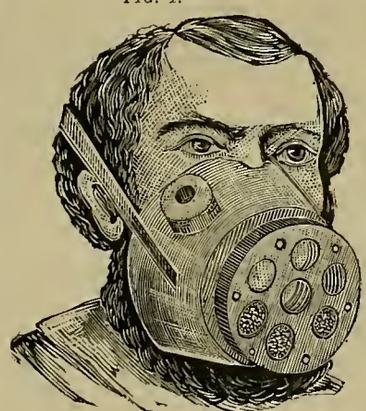
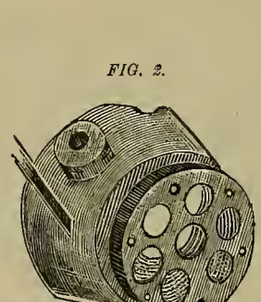


FIG. 2.



RESPIRATOR FOR USE AT REDUCTION WORKS.

An Appreciative Official.—Andrew J. Hatch, Surveyor-General of Nevada, offers a premium of $100 for the most complete report sent to his office hy any County Assessor of that State. Mr. Hatch is an old resident of Nevada, and being himself well-acquainted with its wants, resources and capacities, thoroughly appreciates the value of full and correct statistics in regard to the same.

A new Protestant sect, distinguished like the Shakers hy their physical extravagances, has appeared in Westphalia, the proselytes being chiefly women.

Salmon River.

There is at a great elevation in southeastern Idaho, a mining district that goes hy the general name of the Salmon River country. Concerning its mineral resources a good deal has appeared during the past year in the papers of that Territory, and of Utah, adjoining; the accounts given of it being of a very favorahle description. From the statements of an experienced miner who lately visited that country in the interest of partics in this city, we are inclined to think its advantages as a mining district have been much overrated.

There are mauy ore-bearing veins in that region, both gold and silver, some of which prospect fairly; a few remarkably well. There is also wood and water in good supply, the mountains in some places being quite heavily timbered. But the winters are long and rigorous, the streams freezing up and the snow falling to such depths that the trails (there are no wagon roads) are oompletely blockaded for six months in the year. At the present time it is impossible to get within 25 or 30 miles of the mines with animals; the most of the distance has to be made on snowshoes.

There are no quartz mills or other reduction works in the country. There are, in fact, no improvements of any kind except the few cabins erected to shelter the small population that have wintered there. While there has been but little work done on the ledges, a considerable quantity of fair-grade ore has been taken out, the most of which lies on the dumps at the mines. During the past year some ore has heen shipped to Salt Lake where it was sold for a good price, or worked, turning out well. But this was, of course, carefully selected, as only rich ore would pay the cost of transportation, a good part of which had to be done with pack animals. To build even a tolerable wagon road into the district will cost at least $50,000, and until such road is built it will he next to impossible to get in any heavy machinery. For 40 or 50 miles the country is exceedingly rough, heing rocky and cut up with deep ravines. While there are many large and good looking ledges in this Salmon River district, our informant is of the opinion that it offers no special inducements to mining inveetors just at present.

A Good Record.—The Eureka Con. mining company, of Nevada, have declared a dividend of $1 per share, aggregating $50,000, payable on the 21st. This makes the 42nd dividend declared. Since the resumption of dividends in September, 1877, not a month has passed without a dividend. Up to and including December, 1878, these dividends were at the rate of $3 per share. Since then they have been $2 per share, and now they are reduced to $1 per share, which was the rate paid in the early history of the mine.

New Hydraulic Launch.

There has jnst beeu completed at the shops of Messrs. Thomson & Evans, 112 Beale street, in this city, the complete machinery for a steam launch to be propelled by hydraulio power, whicb has been invented and patented hy Dr. B. B. Brewer, of Sacramento. We understand that the inventor has, after a long series of experiments and a great expense, succeeded in producing a very simple and what promises to be efficient machinery for thie system of propelling. He claims to have entirely overcome the difficulties heretofore experienced by inventors who have experimented in the same direction. He claims that the machinery is equally practical for a fishing boat or a 3,000-ton ship. The vessel has neither wheel, screw nor rudder, and the machinery can be used in a sailing ship without any impediment to her sailing qualities, being useful in calm weather or in severe storms, as a vessel can keep on her course; or in case of a typhoon, the vessel can be kept head into the wind, as she is capahle of turning on her center without making headway, and the pilot has control, with power to reverse her course without stopping the engine, etc. In a point of economy it is claimed that there is a saving of from 25% to 50% over the wheel or screw.

We are restricted from giving a description of the mechanical construction of this peculiar machinery at this time, as the inventor has some points to look after before giving his experience to the world. But we are assured that the little vessel (which is 28 feet long and 6 feet heam) will be launched for her second trial in ahout two weeks, and after certain experiments are completed, the public will he given an opportunity to witness her manœuvers and speed.

An Improved Respirator.

We show on this page an engraving of the patent life-saving respirator for use at reduction works and similar places. Fig. 2 shows the device and Fig. 1 the method of application. In respiring the air is inhaled through a wet sponge or cotton, and in expiring passes out through a valve at the side, so that breathing with the respirator is easy, allowing it to be worn constantly and without any inconvenience.

It is worn over the mouth, nose and chin (as shown), for protecting the throat and lungs from dust, obnoxious smells or poieonous vapors. It is specially adapted for workmen engaged in white lead corroding, lead smelting, chemical works, lead mines, amalgamating and rotorting, dry crushing quartz mills, bullion refineries and quicksilver mines. It is claimed to be a sure preventive of lead poisoning and a guarantee against salivation.

These appliances are in use at Whittier, Fuller & Co.'s white lead works; Melrose smelting works; New Almaden quicksilver mine; Ontario silver mining company, Salt Lake; and at a 40-stamp dry crushing mill with Stetefeldt's furnaces attached. Mr. E. Burnham, Superintendent of the Pioneer white lead works, eays they give perfect eatisfaction, and he considers them a perfect preventive against poisoning through hreathing or inhaling air charged with mercury, lead dust or poisonous vapors or gases. A large numher of firms throughout the East have these respirators in use. They are sold for $3 each, or $30 per dozen, by Seth Marshall, Jr., 309 California street, room 9.

Correcting the Figures.—Certain of our contemporaries in the more distant mining regions are indulging just now in rather hig figures—talking of mineral wortb many dollars per pound, of ore reserves carrying millions in sight, and hullion production that will insure untold profits for all time to come. We like this, hut suggest that the reader remove the decimal points one or two figures towards the left.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Lake District.—The Mammoth Mill and Mine.

Editors Press :—Since the first discovery of mines in this remote section of country, very little information has been imparted to the outside world regarding the true and important value of the silver and gold-bearing belt, which can be readily traced from Markleville, Alpine county, to this point, a distance of more than a hundred miles.

The bold outcrop on the famous ledge called the Mammoth, at once convinces the keen eye of the practical miner that the mother vein of the country is here. The formation is porphyry; the walls are well defined, with no horses to impede the constant ore extraction, and it is to be hoped that handsome dividends will soon be realized by shareholders in this company.

This camp was opened up last summer, and a 20-stamp mill built which commenced crushing ore on or about November 15th, with some stoppages afterwards, owing to the inclemencies of a rough winter. The mill has not in fact been run very steadily since it first started, but we anticipate big results hereafter, there being plenty of quartz to keep 40 stamps constantly employed.

The ore from the croppings of this lode assays, on an average, $30 per ton. The cost of reduction and extraction is probably $5, leaving a net yield of $25 per ton. The facilities for cheap reduction are probably better here than in any other camp on the Pacific coast, wood and water being abundant. The entire body of ore is free milling. Several other companies have purchased mining properties here, but are lying dormant, waiting to see whether or not the results of the Mammoth company's workings will warrant the expending money on their claims.

This camp is situated near the summit of the Sierra Nevada, and about 50 miles in a southerly direction from the town of Bodie. Being at such a great altitude the snow is deep and the weather severe in winter. During the rest of the year the climate is pleasant and always healthful. Near our town, which is on the easterly slope just over the main summit of the mountains, are not less than eight small lakes in which Owens river has its head. We are not over five to six miles from the upper tributaries of the San Joaquin. The country here is heavily timbered with pine, tamarack, fir, etc. The mill is driven by water, enough of which could here be easily commanded to drive 1,000 stamps if required; and in view of the great amount of ore the mine will yield, the present number of stamps will soon be largely increased. The ore already uncovered is estimated at 50,000 or 60,000 tons. A tunnel is being run which will intersect the main vein at a depth of 1,000 feet, affording drainage and an easy means for ore extraction to that depth. The ore is conveyed from the mine to the mill by chute and tramway. Very soon heavy bullion shipments may be expected from this mine.

Prospector.

Mammoth City, Mono Co., Cal., April 14th.

Ditching by Machinery.

Editors Press:—Early in January, in Fresno county, I saw in operation the ditching machine patented by A. McCall through Dewey & Co. Here is what it did in about seven hours' time on Saturday, January 4th: It made complete and in the best style, a side ditch 15 feet wide, sunk 18 inches in the ground and a mile and a quarter long. It runs on four wheels—oddly set on bent axles—was drawn by 16 horses and mules—two and two—and managed by Mr. McCall, with a man and boy to help. Of the 12 animals in the lead, the 6 off ones kept outside of the levee that was being thrown up, the near ones inside of the ditch, while the 4 near the machine all kept inside the ditch. Each levee is raised to a uniform hight of about 18 inches. The incline on its inner side was three to one, but it can make them two to one, or even one to one. Before beginning on the ditch in question, the machine went one and a half miles to work and made a half round on another one and a quarter miles of ditch. The shear that does the work is 10 feet long, and will last from 30 to 60 days. It costs about $9. The cost of repairs for the month amount to only $4 or $5 besides. The expense for men, team of 16 and outfit, is about $22 per day. During its seven hours of work, on the day in question, it removed over 3,000 yards of earth. This will give your readers an idea of the cost of ditching by its use. Mr. McCall informs me that with six or eight animals it is a fine leveler. It can be varied to suit different grades and widths, cutting from three to eight feet by a single cut. The machine I saw has worked in 14 or 15 counties, and had made up to that time in Fresno county some 75 miles of main and side ditches. It has been used considerably for railroad grading, and the noted contractors, Turtin and Knox, estimate that with it 12 horses and 2 men can do as much as 26 men and 40 horses with scrapers, or 90 Chinamen with shovels.

J. W. A. W.

Gold and Silver Mining in Mexico.

Editors Press:—From a letter written by Mr. Thomas Abrams, dated Guanajuate, March 15th, I extract the following, which will undoubtedly interest the many readers of your valuable columns. Among other interesting facts he goes on to state: "There was one bonanza here which was equal to the Comstock in its best days, and lasted 100 years. There have been many others nearly equal to this, and during all this time the people did not understand the *beneficio* well. There are plenty of similar places, and within four or five miles from here there is a large ravine that has gold that I believe would pay 25 cents to the cubic yard and water to wash, and I would guarantee to show more veins of silver and gold on a paying lay than could be worked in 300 years. These lodes are low in silver and high in gold. The silver would assay about six to eight dollars per ton; gold, about from 500 to 1,500 grains per ton. These veins are in the gold-bearing districts, where the Indians work in the rainy season and make from 25 to 50 cents per day. They would not wash a cubic yard in three days to the man. The principal thing they use is a cow's horn split lengthwise for concentrating. Laboring Indians can be got here for from 37½ to 50 cents per day. Provisions are cheaper than in California."

There are points of interest contained in other letters which will be given at another time.

H. W. Rice.

Mining Laws.

Editors Press:—Seeing an article in your issue of March 8th, by "Assayer," from Arizona, I have concluded to enter my protest to any more legislation on mining laws. He admits that miners consider the law of 1872 good enough; and so do I. As a general thing mining camps are hard to find, and are only found by enterprising prospectors, and as soon as a new discovery is heard of, a rush takes place; and if discoverers could only take one claim, the chance are that the class who lay round town waiting for the news of a find, would get the whole benefit of the discovery, as it takes a long time in many cases to determine what is good and what worthless. It would be impossible to legislate so as to suit all parties, and —as I understand it—the existing law was framed in the interest of the working miners, or so as to give those of small means as nearly an even show as possible. I hope it may remain in force, more especially as it is giving more satisfaction than any law, either local or otherwise we ever have had in this part of the country, the growlers to the contrary notwithstanding.

Prospector.

Gibbonville, Idaho.

Promising for Colorado.

A correspondent of the Chicago *Inter-Ocean* says that Colorado Springs bids fair to divide the honors in mining excitement with Leadville, Ten Mile, Silver Cliff—the northern and southern fields of that argentiferous State. Quite recently there have been discoveries of both lode and carbonate deposits of silver in the mountains five or six miles west—between the town and Pike's Peak. A true fissure vein, running through the summit of Cameron's cone, 10,000 feet altitude, and extending three or four miles in a northwesterly and southeasterly direction, has been traced on the surface, and assays show a promising degree of richness for surface. The lode has not yet been opened, but claims are staked over its discovered extent. Cameron's cone is right in front of the Peak, and the nearest summit to it.

Close to and alongside of this lode, on the east, lies a carbonate deposit the extent of richness of which is undetermined, but from which surface assays have shown profitable proportions of the white metal. So far it is not found in combination with lead, but the surface indications are pronounced similar to those of Leadville, and as there is yet but one shaft so much as five feet below the surface, there is abundant room for sanguine expectation of what is below. Iron exists in both the lode and carbonate deposits. The carbonate bed occupies an elevated basin known as Crystal park, a lovely spot a mile or more in extent either way, at an altitude of about 9,000 feet, surrounded on every side by rugged, rocky peaks, cavernous caves forming its western inclosing wall. This park is for the most part smooth and grassy, and covered now with spring flowers, and through it run bright streams of pure and cold mountain water. Its whole extent has been staked over within the last few days, and the claims extend on the hills on every side. It is easily accessible for bridle ponies in two or three hours from Colorado Springs, and a wagon road is entirely feasible.

Should these mines prove profitable, the discovery would be of great importance, and they would be very attractive because of their easy accessibility. Their development would also stimulate prospecting through the mountains of the Pike's Peak spur, which would in all probability result in more extensive discoveries of both fissure veins and carbonate beds, of the existence of which there is little doubt. Numerous stray pieces of very rich mineral have been picked up there from time to time, but the desultory efforts to trace or locate them have heretofore proved fruitless.

Bernardinite—A New Mineral Resin from San Bernardino Co., Cal.

Abstract of a paper read before the Chemical Section of the Cal. Academy of Sciences, by J. M. Stillman, Ph. B.

Through the kindness of Mr. B. B. Redding, of San Francisco, I have been put in possession of some specimens of a new mineral deposit in San Bernardino county, which has been exposed by excavations for a tunnel. The pieces in my possession are homogeneous masses of from one to five or six cubic inches in dimensions, and appear to have been broken from still larger masses. It presents a light, porous, friable mass of a light yellowish-white color, and floats on water like cork. On fracture it shows a slightly fibrous structure, and a consequent toughness, but under the microscope no definite structure, but a quantity of irregular fine fibers running in every direction through a mass of small non-crystalline, but angular fragments of some other substance. No evidences could be seen of any traces of previous woody tissue. The specific gravity of the mineral freed from air was found to be 1.166. The finely powdered mineral softens at temperatures below 100° (C.) but does not fuse perfectly when heated to 140° (C.)

With water it forms an emulsion by boiling, but no solution. In alcohol it is quite soluble. Hot alcohol (absolute) dissolves 86.6% of the native mineral; the remaining 13.4% is insoluble in boiling alcohol. The soluble portion dissolved in 5½ parts of absolute alcohol on boiling, and remained in solution when over half the alcohol had been evaporated, therefore remaining in solution in about two parts to two and one-half parts of absolute alcohol. In cold absolute alcohol it is not so soluble—the extract obtained by hot alcohol would not entirely redissolve in cold, about one-third remaining insoluble. The alcoholic solution is of a slightly yellowish color, acid reaction, and bitter taste. Ether dissolves in the neighborhood of two-thirds of the native mineral at ordinary temperatures. Bisulphide of carbon dissolves it but slightly in the cold.

The extracts in every case were amorphous, white and powdery.

The melting point of the extract with hot alcohol was variously determined at from between 115° and 120° to 120° and 125° (C.), though the substance softened at lower temperatures. Heated on platinum foil, the mineral takes fire and burns with a bright flame, with much smoke, and leaves a fixed carbon residue. When heated cautiously a portion appears to distill off without much decomposition. The ash is very slight. With concentrated sulphuric acid, it gives a brownish red color in the cold, which becomes black by warming. Water precipitates it from the sulphuric acid in black flakes. An ash determination gave for 0.3883 grammes (dried over sulphuric acid), 0.0005 grammes of a light, pure white, infusible ash, evidently silica—a mere trace.

The powdered mineral, dried over sulphuric acid, lost in weight when heated in a platinum crucible for several hours at temperatures from 90° to 125° (C.) 3.87%, probably, though not certainly, due to loss of water.

An elementary analysis of the mineral *dried over sulphuric acid*, after making allowance for ash as determined above, gave: C = 64.53%; H = 9.20%; hence O = 26.28%.

A test for nitrogen was made by igniting with sodium, etc., but none could be detected. If we admit that the lose of 3.87% above cited is due to water alone, we shall have the following as the result of the analysis: C = 64.46; H_2O = 3.87; H (not in H_2O) = 8.75; O (not in H_2O) = 22.80; ash, 00.12; total, 100.00. Or leaving out water and ash from consideration: C = 67.14, H = 9.12, O = 23.75. In caustic potash it dissolves readily, leaving but 6½% insoluble residue which forms a gelatinous mass, drying to a brown, translucent, glue-like substance. The caustic potash solution is of a clear, light, brownish-yellow color, gives a froth by agitation like soapsuds, can be diluted to any extent with distilled water without precipitation, and with dilute chlorhydric acid gives a white flocculent precipitate which settles to the bottom on standing. The concentrated solution in caustic potash becomes gelatinous on cooling, but the mass dissolves when diluted. A quantity of the native mineral was dissolved in caustic potash, largely diluted with distilled water, filtered, re-precipitated with chlorhydric acid, again filtered, the precipitate washed on the filter, dissolved in hot alcohol, also on the filter. The alcoholic solution was then evaporated, the residue dried at 100° for several hours, powdered, allowed to stand over sulphuric acid for one day and subjected to elementary analysis. The analysis gave: C = 69.71%; H = 9.59%; O = 20.70%. Total, 100%.

It is evident that the above resin is not a simple substance, from its relations to the various solvents. It is therefore useless to calculate a formula, unless as a kind of average formula for purposes of comparison. Such a formula would be $C_{40}H_{66}O_9$ (C = 69.56%, H = 9.56%, O = 20.88%). The melting point of the purified substance was found to be 127.9° (C.) for perfect fusion, although it softened more or less at lower temperatures.

The oxygen contents of the mineral, the acid character of the alcoholic solution, the solubility in the caustic potash and the soapy character of the solution, and the reprecipitation by chlorhydric acid, all point to the resinous character of the new mineral. To confirm this, the alcoholic solution of the native mineral was treated with an alcoholic solution of lead acetate, and a heavy flocculent precipitate was obtained.

It is remarkable, however, that the oxygen contents are much greater, as shown by both elementary analyses than is found in most mineral or vegetable resins.

To ascertain if all that portion dissolved in caustic potash was reprecipitated by chlorhydric acid, the filtrate obtained by the solution in caustic potash, precipitation by chlorhydric acid, and subsequent filtering, was evaporated and exhausted with absolute alcohol; a very small quantity of a yellowish, waxy extract was obtained which possessed an intense bitter taste, evidently the substance to which the bitter taste of the alcoholic solution, as well as of the mineral itself, is due, as the resin as above purified for analysis had no bitter taste. This mineral appears to differ in a marked way from any as yet incorporated into the literature.

From *Ozocerite*, *Zietrisikite*, and from all other minerals of that nature, it is entirely different, containing no paraffine, as shown by its solubility in dilute or concentrated caustic potash, by its solubility in alcohol, as well as by its elementary analysis; as all pure specimens of the minerals just mentioned contain in the neighborhood of from 80% to 88% carbon and about 15% hydrogen. From *Geocerite* it differs also in composition as well as in its much higher point of fusion, than that substance. In some of its physical properties and solubilities it resembles the imperfectly-described *Guyaquillite* from South America; differs from it, however, in chemical composition, melting point and other properties. The South American mineral, *Berengelite*, bears some similarity in elementary composition, but appears to differ from it in other essential properties.

At the suggestion of Mr. Redding I have proposed the name of "Bernardinite" for the new mineral, from the name of the locality of its occurrence. I expect soon to be able to subject larger quantities of the mineral to a more thorough investigation, with the view of ascertaining the true chemical nature of the various constituents, which are at least four, and perhaps many more in number.

University of Cal., Berkeley, Feb. 28th.

A Mountain of Gold.

The traditions of Arizona dating from the period of the Spanish conquest, now more than 300 years have always pointed to this Territory and claimed for it the richest and most wonderful mines of gold and silver in the world. The very mountains and hills were said to be veined with gold and silver and the plains to be covered in places with precious stones. Among other wonderful things in Arizona tradition has for all these ages pointed to the northeastern portion of the Territory as the seat of the great mountain of gold, a cone whose sides were said to glitter with crystal quartz veined with drops and threads of virgin gold. That in all the world this was the great storehouse of the precious metals has been believed for ages.

Time after time parties of prospectors have attempted to explore the region referred to and all have failed. Small parties at different times have traveled through, but owing to hostile demonstrations from Indians have always failed to remain long enough to find out thoroughly what really were the resources of the country. Several have found gold in paying quantities, but have been obliged invariably to leave before finding out anything definite.

Last summer James L. Hill came through the country here referred to, and claims that in prospecting he discovered the place designated by tradition as the "Mountain of Gold," and that its richness in reality is fabulous. The Indians, however, prevented him from working to any extent, and he was obliged to leave in haste.

He expects, however, to start out in a short time in company with Mr. Freeman, who has also been through that section, and a party of about 50 well-armed men, thoroughly explore the country and find out what it contains. If the country is half as rich as it is reported we soon expect to hear of wonderful fortunes being realized and that the famous "Mountain of Gold" has at last been appropriated for the use of mankind.—*Arizona Enterprise.*

Miners' Superstitions.—Like many other people, miners have their superstitious beliefs. There are few, indeed, of the gold hunters who do not nurse some strange fancy regarding the circumstance that are supposed to exercise marked influences over their operations, rewarding them with success or failure in the same proportion that they take steps towards propitiating the gods of fortune or frightening away the demons. Perhaps the horseshoe belief is the most universally accepted one among the miners, as it is also by men engaged in other industries. There are a number of the leading quartz mills and hoisting works of this district that have the doors of their offices ornamented with a horseshoe that bangs over the entrance, and some miners refuse to work unless one is put up at the entrance of the tunnel or main drift. In gravel mines these symbols are also observed sometimes, but not to as great an extent as where quartz is being taken out. One large mine near this city has no less than six old rusty horseshoes about the works and drifts, and still that mine is a continual drain on the pockets of its owners. There is nothing like faith, though, and they may strike something rich yet.—*Nevada (Cal.) Transcript.*

MECHANICAL PROGRESS.

Progress of the Iron Interest.

Hon. D. J. Morrell, assistant commissioner from the United States at the Paris exposition, in bis report on the iron and steel exbibits, says:

The display of iron and steel products bas never been equaled at a world's fair, wbilo the display of machinery generally has only been equaled hy that made at Philadelphia. The Philadelphia exhibit of machiuery was more extensive and more varied tbaa that of Paris, and it poescssed an additional advantage of being more generally in motion. But the Paris exposition demonstrated more fully than the Philadelphia exhibition, or any previous international exhibition, the efficiency of machiuery in all industrial enterprises, tbe offorts of every progressive nation to obtain the best macbiuery for its own service, and the necessity imposed npon all, by their active competition with oae another, to adopt every new device and improvement wbich tends to increase, perfect and cheapen product. No nation now hae a mouopoly of the manufactnre of any kind of iron or any kind of steel, or of tbe use of any machinery necessary to their productiou. Some countries will, of course, continue to display greater enterprise than others in the utilization of their resourcee for the manufacture of iron and steel, but none of the leading nations of the world will lag behind because they bave not become practically familiar with tbe best methods adapted to this utilization.

Iron Giving Place to Steel.

But a fact of still greater general significance wae illustrated at Paris in the large aad varied display of Bessemer products which were there exhibited. All the leading iron-making countriss exhibited Bsssemer steel, and ia most every form in which other kinds of steel and all kinds of iron have heretofore been used. The Paris exposition showed that the progress made dnring the past two or tbree years in the manufacture of Bessemer steei, and open-heartb steel as well, is so great tbat statistics fail to give any proper conception of its magnitude.

The London *Times* remarks that "the Bessemer process has ruined the manufactnred iron trade." But it has done more than this, it has distributed among many countrics tbe manufacture of Bessemer steel, and thus enabled them to eupply more fully their own metallurgical wants, and the metallurgical wants of other countries, in lien of tbeir own previons partial dependence upon Great Britain itself. Here is a new revolution, or a new revelation, in connection with the world's iron industry, which was reserved for Paris to make clearly manifest through tbe abundant proofs there furnisbed of the wide distribntion of the Besoemer process and the wide snbstitution of Bessemer products for those of iron and other steel processes. And wbat bas been said of the Bessemer process, and of the injury it has inflictsd upon the Britisb iron trade, is applicable also in a large degree to the Siemens-Martin process and its modifications.

A New Departure in Car Construction.

Tbe *Railway Age* of Marcb 6tb, contains an engraving and description of a new style of freigbt ear invented by a Mr. Prosser, of Cbicago, wbicb is sucb a radical departure from tbe usual mode of construction tbat it may be regarded as a novelty and cnriosity combined. It is a structure corresponding to a four-wheel car, but in its design the wbeels and axles proper are entirely dispensed with, or rather superseded by a pair of iron or steel plate cylinders, with flanges attached to keep them on the track, and with trunnions working in a simple frame-work in tbe form of side and end sills. There is no car-body, but a mere platform extending over the cylindere and held in position by supports resting upon the frame-work helow. The cylindere are the receptacles of the freight, whicb is of course rolled around with tbe cylinders. Tbis in brief is all there ie of it. The idea is not a new one. Something very similar was proposed eeveral yeare ago, but we cannot now recall tbe particulare. Notbing came of it, bowever, and, like innumerable other noveltiee originating in the prolific brains of inveatore, it was consigned to tbe category of forgotton thinge.

Assuming tbat there are no mechanical difficulties in the practical working of tbis arrangemeat, it is easy to eum up ite many apparent advantagee as compared witb the kind of care now in use. The car ie cheap, eimple, light, durable, drawe easier, there is less friction, tbe weigbt of load is removed from the journals, the center of gravity is brougbt nearer the track, it ie indeetructible by fire, etc.; but it will readily occnr to railroad men tbat encb a contrivance would only be adapted to certain kinds of freigbt—to very little in fact except grain—and wbat effect eucb a tremendous rolling would have upon the grain, remains to be eeen. It certainly would never do to pack the cylindere witb any kind of merchandise labeled "tbis eide up, with care," nor with live stock of any deecription, nor with agricultural implements, or dairy products, or ligbt macbinery, or anything brittle or angular, or liable to damage by abrasion. Nor could fractional loads of any kind be carried to much advantage; and if available for grain traffic, tho cars would almost necessarily be compelled to run empty in making return trips. It is hardly worth while, however, to speculate on the results, as a car of this description has already been built for expriment, and it ought to be a very easy matter to test its utility.—*National Car Builder.*

Steeline.

Tbis is the namo of a new compound which has rcently been introduced by Messrs. Bauer & Co., of New York, for refining and tempering steel. They claim for it among other things that it secures absolnte safety from cracking, adds greatly to the tensile strength, and that by it use inforior grades of steel become of superior firmness and toughness to the best grades. From the directions for using, which we quote from their circnlar, it will be soen that the new compound must havo some qualities that differ greatly from those of other tempering and refining substances:

Heat the steel articlo to be tempered to a wbito heat (burn it). Cool the same off in the compouad, until almost cold; heat it again to a cherry heat, and theu cool off in fresh water. Articles whicb do not require a high tempsr, ought to be heated to a dark, scarcely preceptible red heat, before they are cooled off in water. With some experience, parties can temper steel witbout afterwards being obliged to draw the temper.

The firm give tbeir reasons for this rather unusual treatment, as follows:

All grades of steel contain more or less impurities, such as sulphur, etc., which are impedimonts to its toughness and strength. The easiest way to destory these impurities is to burn them out. By burning the steel we destroy these impurities, as well as the carbon; but by immersing the burnt steel into our compound "Steeline" we recarbonize the same chemically with tbe necessary percentage, rejecting all impnrities.

What we assert ie very easily demonstrated by taking a piece of steel, tempering one end of it ia the regular way, burning the other end, and immersing it in "Steeliue," then heating it to a lower heat than usnal, and going into water. By breaking off a piece at each end, the difference will be found surprising.—*American Manufacturer.*

Cast-Iron Forts.—The new solid iron fortifications at tbe mouth of the Weser, in the north of Germany, have just been finished. Tbere are tbree forts, containing nine 21 centimeter guns, and 10 revolving turrets, accommodating 15 guns of 15 and 28 centimeter caliber. These solid iron etructuree have a total weight of 7,650 tone; present convex and oval fronts to the enemy, and are impervioue to the heaviest artillery known. The loopholee open at the moment of firing, being ordinarily protected by oval valves of the same solid material. Botb batteries and turrets are provided with ventilating apparatus, and hydraulic engines for workiug the guns.

Hints for Molders.—To perfectly accomplish the running-in of the metal in molding, the following rnlee have been laid down by a recent writer on tbe subject: Choose if possible the thickest part of the casting for the runner, and if the casting is deep, run in tbe metal at the hottom; where tbe casting bas a flange in the form of a pipe, it is generally preferred to run the metal in at tbe flange; when tbe casting ie thin and has many branches, or when it is of great length it is advisable to run in tbe metal in the center; care should be taken to choose a place in tbe mold, so that the mold will bave no tendency to wash any part away in its first rush; and the metal should not he allowed to fall from any bight upon a weak part of the mold.

New and Valuable Steering Invention.—A new invention for eteering vessels by steam instead of hy hand was tested in New York, a fews days since, on one of the largest and most unmanageable tngs in that harbor. By the old way of steering a veesel, when tbere is a strain on the right of the rudder there is a correspondiug elack on the left, and tbis is what causes all delay and hard work in handling tbe wheel. Tbe new invention picke up this slack and holds it. No matter in wbat position or in wbat angle the rudder is placed, it ie beld as taut as though it wae etraigbt.

The Blessing of Steam Power.—The aggregate eteam power in nee in tbe world ie at present 3,500,000 borse-power employed in etationary engines, and 10,000,000 borse-power in locomotive engines. This force is maintained witbout the consumption of animal food, except by tbe minere wbo dig the coals, and the force maintained in tbeir mnscles, is to the force generatcd by tbe product of their labor about 1 to 1,080. This eteam power is equal to the working force of 25,000,000 of horsee, and one borse consumee three times as much food as one man. The steam power, therefore, is equivalent to tbe saving of food for 75,000,000 of buman beinge.

Welding Copper.—According to *Dingler's Journal*, copper may be welded if covered at a red heat with a mixture of one part phosphate of soda and two parte borax, and submitted at once to the hammer.

SCIENTIFIC PROGRESS.

Substitutes for Ether and Chloroform.

A committee of the British Medical Association has lately issusd two reports, giving an account of some very valuable experimental trials of a number of new anæsthetie agents which they have studied, with the object of finding a substitute for chloroform and ether, the agents commonly employed by the surgeon and obstetrician. Neither of these fully meets the requirements of surgical practice, the administration of chloroform being never free from danger, and always a source of anxiety on tbat account to surgical operators, and especially in operatione of a protracted naturo, where its disastrons effects npon tho action of tho heart and the respiratory organs is occasionally tbe cause of fatal consoquences; while ether, though vastly euperior to chloroform in these respects, is too tardy in its action for many important operations. The purpose of the above-named committeo was to find, if possible, an anæsthetic agent that should he as potent in its effects as chloroform, and that, at tbe same time, should affect the heart and respiration as little as ether.

From the abstract of tbeir reports, in the *Monthly Journal of Science*, it appeare that many experimental trials were mado upon frogs and rabbits, with the followiug substances: Benzine, acetone, pyrrol, bichloride of methylene, amylene, butyl chloride, ethene dichloride, methyl chloride, ethyl chloride, nitrons ethyl ether. The experimental trials of the committee witb the above-named substances were unfavorable, either for tbe reason tbat they did not complete anæsthesia, or because the anæsthesia was attended with euch violent and alarming physiological disturbances that their use in surgery was not to be thonght of. With two substances only did the committee obtain successful results; these were the isobntyl cbloride and ethidene dichloride.

Isobutyl chloride (C^5 H^9 Cl) produced complete anæsthesia in frogs, rabbits, and dogs, in from three to five minutes, and no disturbance of the heart action or of respiration was noticed when anæsthesia was contiuued for half an hour or longer. Ethidene dichloride (C^2 H^4 Cl^2), an isomeride of ethene dichloride produced from aldehyde, gave even better results than the agent above described, and the committee thereupon tested its virtues upon six patients in the Western Infirmary of Glasgow, upon whom snrgical operations of more or less severity were performed with its aid, and witb the most encouraging results. We cannot do better, in view of the importance of these researches in the interests of bnmanity, than to give the committee's conclnsions at length, as stated by our authority.

The features of special interest in tbese cases are tbe facts that there was no injurious effect observable on the respiratory mechanism, although in all casos tbe anæsthetic was given in such doses as to produce complete anæsthesia and muscular relaxation, and in one the patient was deeply under its influence for 25 minutes. 2. The pulse diminiehed in frequency and increased in volume, and in tbe deepest anæstheeia was steady, regular, full, and compressible. There was no indication of failure of cardiac action in any case—a result anticipated from what had previously been observed in animals. 3. There was never any pallor of tbe countenance, or bluenese of the lips; but, on tbe contrary, and even during the deepest anæsthesia, tbere was a healthy flush in the face, and the lips were rosy-red. Taking into account the change in the character of the pulse and in the color of the face, it would appear that in anæsthesia from dichloride of ethidene, the blood still remains in a normal amount in the arterial and capillary eystems, and does not tend to engorge the venous system and right side of tbe heart, as is apparently tbe physiological action of chloroform. It appeared, also, in further experiments witb this agent on animale, that they could live for a leagthened period in a etate of complete anæsthesia under its influence, while, on the contrary, tbey will speedily die when chloroform is used. Tbe investigations of the committee, it would appear, bave had the valuable result of supplying the surgeon with one (and possibly with two) anæsthetic agents superior both to cbloroform and ether—a result of inestimable importance for the scientific alleviation of human suffering. The committee is continuing its researchee, and a third report is expceted at an early day.

The progrees of tbe metric eyetem of weigbts aad measures appears from a etatistical table recently prepared by M. Marlaree. It is now estabiiehed obligatorily in eighteen etates, representing a population of 236.6 millions, comprising Franco and her colonies, Belgium, Holland and colonies, Germany, Sweden, Norway, Austro-Hungary, Italy, Spain, Portugal, Roumania, Greece; Brazil, Columbia, Ecuador, Peru, Cbile and the Argentine Republic. It has been made legally optional in England, Canada and tbe United States, comprising a population of 75.6 millions. It is admitted in principle, or partially for customs, in Britieb India, Ruesia, Turkey and Venezuela, eo tbat it is in use obligatorily or permissibly in twenty-five states, witb 635 millions of inhabitants. In Switzerland, Mexico, Japan and China, representing 471 millions of people, tbe decimal syetem of divieion and subdivieion is in use, but applied to other units than the meters.

A New Method of Determining High Temperatures.

In very many manufacturss an eormous degree of heat is required for carrying ont the various operations. The means hitherto at our disposal for testing thoso temperatures, which sometimes require to bo accnrately regulated, are limited by the point of fusion of the thermometrie tube.

Mr. Crova, professor at the Faculty of Scieness of Montpellier, has had the ingenious idea of bringing tbe spectroscope to the aid of the manufacturer, and his efforts bavo been most successful. By the means he has adopted, heats bitherto incalculable can be determined very preciely. The process by which he proceeds is, roughly speaking, to adopt a fixed standard, and, having settled that point, to examine by the aid of a spectroscope, the flames of the incandescent objects, and redoce them by interposing obstructives of known power to the same level as the standard. That arrangement he calls a spectro photometor. Of course, in such an apparatus, the primary data must be purely arbitrary. Mr. Crova takes as the point of departure tho heat emitted by an ordiaary moderator lamp-burning oil, and that he fixes at 1,000. In comparing other incandescent eubstances with that standard, he finds tbat the heat of a picce of platinum, warmed to tbe red in a gaslight, is 524; the same material raised to a white heat by the blow-pipe, 810; a regulation stearine candle, 1,162; an Argand burner of ordinary gas, 1,373; the oxy-bydrogen light (common gas and oxygen on lime), 1,806; the electric light (60 Bunsen elements), 3,060; and the ligbt of the sun, 4,049. Carbon, lime and platinum, when incandescent, bave tbe same power, and probably magnesium.

This new system is calculated to be of vast importance to manufactnre, by enabling the operator to regulate hie fire so as to produce tbe precise effect desired. M. Dumas, in briuging the matter under the notice of the Academy of Sciences, stated that he considered it as the greatest discovery of modern times, and M. Berthelot warmly supported bis statement.—*Galignani.*

Science in the Industries.—Hitberto tbe syrup produced in the process of the manufacture of sugar from beet root has been but little bettsr tban a waste product. But the science of chemistry has recently come to the aid of the heet sugar manufacturers in the following manner, condensed from tbe *Am. Jour. of Pharmacy* for March: "As one of the most striking improvements in applied chemistry shown at tbe late Paris exbibition, *Dingler's* refers to the process of Vincent and otbers for working over the molasses residues from tbe beet sugar manufacture, whicb have of late been introduced in France, and by wbich it has been found profitable to turn to useful account, in producing several valuable products, what was long regarded as a waste product. These molasses residues (after extracting the potasb salts) are submitted to a dry dietillation, in which process gases, tar and mucb condensed water are obtained. From the last named (which alone is useful) there are obtained ammonium eulphate, methyl alcohol and large quantitiee of crude tri-methylamine salts. The alcohol is valnable in the manufaoture of aniline colors; and tbe tri-methylamine salte are converted, by a process of Vincent, into methyl chloride, wbich is eimilarly used, or, being an extremely volatile liquid, is used in making artificial ice." Tbe value, to the world, of this last contribntiou of applied chemistry may be feebly inferred from the fact that the annual production of beet sugar in Europe bas now reacbed the enormous annual aggregate of 1,300,000 tons, and is still rapidly increasing.

The Composition and Uses of Furnace Gases.—It has been ascertained that gases collected in the most heated parts of furnacee working iron, and rapidly cooled differ completely from tbe results given by the analyeis of Ebelmen. This able metallurgist, iguoring tbe pbenomena of dissociation, collected the gasee by slowly aspirating them through a long tube which allowed the combination of the dissociated elements. In Ebelmen's analyses, the reaction nearly always appears complete, whereae the author finds that the fumes and carbureted gases may exist in the presence of oxygen, and at the temperature of molten irou. Gas collected above tbe grating of a furnace where the bricke were at a temperature of intenee white heat, contained: Oxygen, 13.15%; carbonic oxide, 3.31%; carbonic acid, 1.04%; nitrogen (by difference), 82.5%. In metallurgical worke tbe gases ieeuing from tbe furnaces are genorally directed beneatb eteam generators, but tboy cool very rapidly againet the eides of tbe boiler; so that after traversing about 50 feet the temperature is lowcr than 500°, and tbe gases then contain per cent.: Oxygen, 7.65; carbonic oxide, 3.21; carbonic acid, 7.42; nitrogen, 81.72. Tbe quantity of oxygen hae thus diminisbed by nearly one-half, and hae been lost by its reaction on tbe finely-divided carbon which exists in great quantity in tbe atmospbere of tbe furnace.

Nobel's explosive gelatine was recently tested at tbe St. Gotbard Tunnel works, and bas been reported to possess double tbe explosive energy of dynamite. It bas the additional advantage over the latter, aleo, of keeping for an indefinite period under water without deterioration.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Mar. 27.		Week Ending Apr. 3.		Week Ending Apr. 10.		Week Ending Apr. 17.	
Alpha	19¼	16¾	18¾	17	20	16¾	23½	19½
Alta	5.90	5	5⅛	4½	5½	3⅞	5⅝	4.90
Andes	40c	35c	40c	....	40c	30c	40c	35c
Alps	....	....	....	....	....	....	....	....
Argenta	1.10	90c	1	....	1.30	1.05	1.65	1.20
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	1	....	1	90c	50c	....	....	....
Belcher	8½	6½	8½	6	6½	5½	6	6⅛
Belmont	50c	40c	45c	40c	40c	15c	30c	25c
Best & Belcher	17½	15	16½	15	16½	14	17	15¾
Bullion	5⅞	4½	5½	4.95	5½	4.70	5½	5⅛
Bechtel	2.15	1.70	1.90	1½	1.80	1½	1.60	1¼
Belle Isle	35c	30c	35c	30c	45c	35c	40c	35c
Bodie	7⅜	6	7	6½	10	7½	9½	7⅞
Benton	4.20	3	3½	3	3½	3	3½	3
Bulwer	17	15½	16¾	15½	21	18	22	19½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	4	2½	3½	3.20	4½	3.60	4.70	2.60
Belvidero	2	1.45	1¾	1.30	2	1.30	1.80	1⅞
Booker	85c	60c	70c	50c	75c	50c	70c	65c
Caledonia	2.65	2.10	2.55	2.10	2¼	2.15	2¼	1¾
California	5⅞	4.80	5⅜	4.90	5⅝	5½	6	6⅜
Challenge	3.20	2.10	3	2½	2.90	2½	3.20	2.80
Chollar	43½	35½	46½	42	6½	5½	6½	5¾
Confidence	14½	10	14	11	14½	12	15	14
Con Imperial	1.35	1.05	1.35	1.05	1.55	1.20	1.70	1.35
Con Virginia	5½	4.60	5⅜	4.90	6	4.95	6	5½
Crown Point	6⅛	4½	5⅜	4½	5½	4½	5½	4¾
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	25c	40c	15c	40c	30c	35c	25c
Concordia	15c	....	25c	....	35c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	5c	....	5c	....	....	....	20c	10c
Daney	....	....	....	....	....	....	....	....
Day	30c	20c	30c	25c	30c	25c	45c	30c
Eureka Con	22	18½	19	15¾	18	16	17	16
Exchequer	4½	3½	5	4.60	5	4½	5⅜	5½
Endowment	25c	5c	30c	....	25c	....	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4.30	4	6¾	3.35	3½	3½	3½	3
Gila	30c	....	....	....	30c	25c	35c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	9½	....	10	9	9½	....	9	....
Goodshaw	70c	50c	55c	45c	50c	45c	50c	40c
Gould & Curry	9⅝	7	8½	7	7½	6⅞	8¾	8¼
Hale & Norcross	13½	9⅝	11⅞	10¼	10⅛	7½	12½	10⅜
Hillside	2¼	1⅞	1¾	1	2	1½	2.15	....
Highbridge	50c	40c	45c	35c	45c	35c	50c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	....	20c	15c	15c	....	15c	....
Independence	1¾	1.60	1.60	1½	1.55	1½	2⅞	1.60
Julia	4¾	4	4.30	3.80	3.90	3.40	4.10	3½
Justica	3.80	3½	3.85	3.20	4.70	3.15	4½	3.60
Jackson	5½	5	7	6	8	7	7½	7½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5	4½	5	4½	5½	4.60	5	4⅞
Kossuth	15c	....	10c	....	10c	....	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1¼	60c	1.15	80c	95c	75c	80c	60c
Lady Wash	1¼	1	1.10	1	1.20	70c	1	85c
Leopard	1¼	85c	1	50c	75c	60c	1½	1.20
Leviathan	30c	20c	30c	20c	50c	20c	50c	40c
Leeds	75c	60c	60c	....	60c	55c	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	85c	30c	25c	....	25c	....	25c	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1.80	1½	1½	1.10	2½	2½	2.95	2½
Martin White	6½	6	6½	5½	6½	6½	6½	6
McClinton	1.30	1	1.30	1.10	1.30	1	1¼	1.10
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	35½	24½	33¾	29	30¾	29	32½	30
Mides	....	....	....	....	....	....	1	....
Morning Star	....	....	3	....	....	....	2	....
North Con Virginia	9⅝	7½	9½	7⅞	8	7⅞	8½	8
New York	30c	55c	80c	60c	70c	55c	70c	60c
Northern Belle	10⅞	9½	10	9½	10	9⅛	9⅞	8
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	30c	25c	....	25c	....	25c	....
Occidental	....	....	....	....	75c	....	....	....
Ophir	31	24½	24¾	20½	23	20⅞	25½	22¼
Oriental	75c	55c	60c	55c	60c	55c	55c	30c
Overman	10⅞	9	11	9⅛	9⅞	9	9⅞	9⅛
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	2½	2	3½	1⅞	3	....
Phil Sheridan	35c	15c	20c	10c	15c	10c	10c	5c
Potosi	....	....	....	....	5½	4	4½	3.95
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	5½	5½	5	5½	4	5½	4½
Richer	70c	85c	....	....	90c	75c	80c	70c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11⅞	9½	11¼	8⅞	10¼	9	11	9⅞
Seg Belcher	....	....	....	....	31	20	....	....
Sierra Nevada	47½	37	47	41¼	43⅞	40½	43½	41⅞
Silver Hill	1.80	1.30	1.60	1.35	1½	1.10	1.30	1.05
Silver King	8	....	8	7½	7½	7	....	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	1	30c	65c	40c	60c	50c	65c	50c
Summit	2.40	2	2¼	2.05	2½	2.10	2.40	2
Scorpion	1.80	1	1⅞	1.40	1.65	1.30	1.60	1.40
Solid Silver	40c	30c	35c	....	35c	....	35c	30c
South Bodie	50c	40c	35c	30c	60c	40c	50c	40c
South Standard	25c	15c	30c	20c	30c	15c	25c	20c
Star	50c	....	60c	50c	50c	40c	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	....	....
Tioga Con	2.30	1.90	2	1⅞	2	1⅞	2.30	1.95
Tiptop	1.05	75c	75c	....	75c	70c	75c	50c
Trojan	20c	15c	20c	15c	20c	10c	15c	10c
Union Con	66½	53½	80	54½	56½	53	59½	57
Utah	18	12	15½	13⅞	15	13½	15½	13⅞
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.35	1	1.20	95c	1.10	95c	1.15	1.05
Wells-Fargo	10c	....	15c	10c	10c	5c	10c	....
Woodville	....	....	15c	....	....	....	....	....
White Cloud	1	....	....	....	....	....	....	....
Yellow Jacket	16	11½	14⅞	13½	15¼	13	16½	14⅞

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 11.
310 Alpha........23@23½
280 Alta........5@5⅛
300 Andes........40c
1450 Belcher........5⅞@6
820 Bullion........5½@5⅞
90 Best & Belcher...16⅞@17
240 Benton........3½
455 California........5⅞
695 Con Virginia........5⅞@6
420 Chollar........6½@6½
130 Confidence........15
6310 Con Imperial..1.70@1.65
725 Crown Point........5½@5½
155 Caledonia........2.15@2½
500 Challenge........2.90@3
605 Exchequer........5⅞@5½
1075 Flowery........60@65c
650 Gould & Curry.....8⅞@8½
490 Hale & Nor......10½@10
355 Julia........3.90@3.80
1215 Justice........3.95@3.60
100 Kossuth........20c
80 Kentuck........4.90@5
50 Lady Wash........90c
200 Leviathan........45@40c
280 Lady Bryan........60@75c
345 Mides........1
200 Mexican........30½
120 Mackoy........3.15@3.10
200 Mt View........3½@4
130 North Con Vir........8½
250 N Bonanza.....1.40@1.45
450 New York........60@70c
335 Ophir........23@22⅞
25 Overman........9⅞
150 Phil Sheridan........5c
180 Potosi........4.10@4.05
165 Savage........10½@10½
70 Sierra Nevada........42⅞
1375 Succor........60@65c
325 Silver Hill......1.20@1.15
810 Scorpion........1½@1.40
300 Solid Silver........35c
500 Trojan........15c
25 Union Con........57½@57
20 Utah........15
200 Wells-Fargo........10c
40 Ward........1.05
945 Yellow Jacket.....16@16½

AFTERNOON SESSION.
200 Albion........25c
810 Argenta........1.20@1½
445 Booker........55@65c
830 Black Hawk...4.60@4.70
865 Belvidere........1.80@1⅞
145 Bodie........7½@7⅞
55 Bechtel........1½@1.55
300 Belmont........30@25c
440 Bulwer........20½@20
610 Belle Isle........40c
890 Champion........35c
350 Caledonia (B H).2.20@2⅞
520 O Pacific........2.70@2.55
430 Dudley........40@35c
100 Day........30c
500 DeFrees........15c
100 Endowment........25c
25 Eureka Con........16½
280 Goodshaw........45@40c
630 Grand Prize........3½@3½
200 Gila........30c
255 Hussey........15c
175 Hamburg........50c
600 Independence...1⅞@1.60
900 Jupiter........50@60c
50 Jackson........7½
100 Leopard........1½
95 Manhattan........2½
830 Mono........3@2½
475 May Belle........25c
550 McClinton........1½
400 Navajo........25c
400 Noonday........2⅞
250 N Noonday........1.15
125 Northern Belle....9½@9⅜
150 Oriental........55c
485 Paradise........1½@1.40
100 Real del Monte...4@3.80
300 Revenue........1
200 Richer........80c
100 Raymond & Ely........5½
380 Summit........2.40@2.30
550 S Bodie........40@50c
600 S Bulwer........80@90c
1000 S Standard........20@25c
200 Tuscarora........5c
160 Tioga Con........1.95
900 University........60@55c

Saturday A.M., Apr. 12.
270 Alpha........20½
70 Alta........5½@5
570 Andes........35@40c
620 Argenta........1.30@1.35
20 Best & Belcher........15⅝
1025 Belcher........5⅞@5⅞
320 Bullion........5½
50 Benton........3.30
450 Belle Isle........35c
1000 Brilliant........25c
670 Bechtel........1¼@1½
670 Belvidere........1.80@1⅞
5 Bulwer........20
50 Booker........65c
1205 Black Hawk........4@3.60
100 Bodie........7½
690 California........5⅞@6
75 Crown Point........5
830 Caledonia........2
790 Con Virginia........5⅞@5⅞
100 Chollar........6½@6⅜
3450 Con Imperial....1.55@1½
100 Challenge........2.80
160 Confidence........14@14½
850 Champion........30c
200 C Pacific........2.65@2½
650 Day........30c
50 DeFrees........20c
610 Dudley........50@55c
420 Exchequer........5½@5⅞
50 Eureka Con........17
960 Flowery........80@65c
275 Gould & Curry........8½
25 Grand Prize........3½
60 Gila........30c
100 Goodshaw........40c
180 H & Norcross....11½@11½
200 Hillside........2.15
150 Hussey........15c
300 Independence....1¾@1.80
365 Julia........4@3.90
250 Justice........3.95@4
110 Jackson........7½
150 Jupiter........60@50c
50 Kentuck........4⅞
100 Kossuth........15c
100 L Bryan........80c
50 Lady Wash........90c
105 Leopard........1½
100 Mexican........30
40 Morning Star........2
170 Mackey........2.90@3
120 Manhattan........2½
180 McClinton........1.10
660 Mono........2.90@2.70
210 M White........6½@6½
690 N Bonanza......1½@1.40
600 New York........65@60c
10 N Con Virginia........8
210 Northern Belle........9
840 Noonday......2.40@2.60
840 N Noonday........1½
245 Ophir........22½@22¾
120 Overman........9½
690 Oriental........55c
210 Potosi........4
450 Phil Sheridan......5@10c
400 Paradise........1.45
350 Raymond & E........5½
100 Richer........80c
75 Savage........10½@10¾
2050 Succor........60c
235 Silver Hill.....1.15@1.20
830 Scorpion........1.40
175 Sierra Nevada........42½
400 Solid Silver........30c
350 Summit........2.40@2.30
100 South Bodie........40c
550 S Bulwer........80c
1400 Tioga........2
250 Trojan........15c
555 Tiptop........70c
200 Union Con........57@57⅞
10 Utah........14⅞
550 University........60@55c
300 Ward........1.05@1.10
565 Yellow Jacket...14⅝@15½

Monday A. M., Apr. 14.
50 Andes........40c
475 Alta........5
190 Alpha........21@22
375 Belcher........6
80 Best & Belcher...16½@16⅞
70 Benton........3
10 Bullion........5½
140 Caledonia........2
835 Challenge........3@3.05
375 California........5⅞@5⅞
4520 Con Imperial..1.60@1.65
880 Con Virginia........5⅞
300 Chollar........6½@6½
390 Crown Point........5@4⅞
270 Confidence........14⅞@14½
690 Exchequer........5⅞
160 Flowery........60c
275 Gould & Curry.....8⅞@8⅞
265 Hale & Nor......11½@11½
140 Justice........4½@4.15
355 Julia........4.10@4
10 Kentuck........4⅞
150 Lady Bryan........80@75c
400 Leviathan........50@45c
350 Mexican........30⅞@30
225 Mackey........2.95
100 N Bonanza........1.30
20 North Con Vir........8
350 New York........55c
600 Ophir........24@24½
120 Overman........9½@9½
250 Phil Sheridan........5c
1350 Succor........60@65c
100 Silver Hill........1.30
390 Scorpion........1.60@1½
85 Sierra Nevada....42½@42⅞
175 Savage........10⅞@10½
400 Solid Silver........30c
300 Trojan........10@15c
5 Union Con........57
300 Ward........1.15@1.10
480 Yellow Jacket...15⅞@16½

AFTERNOON SESSION.
745 Argenta........1½@1.45
100 Albion........25c
530 Bodie........9½@9
400 Belle Isle........40c
500 Bechtel........1.55@1.60
180 Bulwer........22@21⅞
450 Belvidere........1⅞
150 Booker........70c
1450 Black Hawk........3½@3½
100 Caledonia (B H)........2½
1090 Champion........30c
430 Con Pacific......2½@2.55
100 Day........35c
50 DeFrees........15c
150 Dudley........50@40c
210 Eureka Con......16½@16½
30 Goodshaw........40c
400 Gila........30c
300 Hamburg........50c
275 Hillside........2.15
700 Highbridge........50c
250 Hussey........15c
780 Independence..2.10@2.30
1950 Jupiter........65c
130 Jackson........7
90 Leopard........1.20
200 McClinton.....1.20@1.15
1000 May Belle........25c
210 Manhattan.......2.60@2½
660 Mono........3½@3.05
350 Martin White........6
350 Northern Belle........8⅞
250 Noonday........2.60
300 N Noonday........1½
100 Paradise........1½
50 Phenix........3
25 Raymond & Ely........5½
175 Revenue........1
200 Richer........75@80c
530 Summit........2.20@2
800 S Standard........25@20c
900 S Bulwer........85@90c
410 S Bodie........50@40c
710 Tiptop........70c
1000 Tuscarora........5c
320 Tioga Con........2.30@2½
1000 University........55c

Tuesday A. M., Apr. 15.
50 Alta........5⅞@5.10
5 Alpha........23
10 Bodie........9
260 Belcher........6@5.90
20 Best & Belcher...16½@16⅝
150 Bullion........5½
100 Benton........3
60 Challenge......3.15@3.20
150 Chollar........6½@6⅜
30 California........5.90
135 Con Virginia........5½@5⅝
170 Crown Point...4.95@4.90
200 Caledonia........2@1.95
2270 Con Imperial..1.65@1.55
200 Exchequer........5.70@5⅞
160 Gould & Curry........8⅞
20 H & Norcross....12½@12½
50 Julia........4.05@4.10
180 Justica........4.10@4.05
105 Mexican........31½@32½
290 Ophir........25@25½
60 Overman........9½@9⅞
230 Potosi........4½@4
300 Savage........10⅞@11
250 Silver Hill.......1½@1.30
50 Sierra Nevada........43½
60 Utah........15½
30 Union Con........59½
100 Yellow Jacket........16½

AFTERNOON SESSION.
10 Andes........40c
50 Alta........5.10
100 Argenta........1½
10 Bodie........9½
400 Brilliant........30c
10 Best & Belcher........16½
35 Belcher........5.95@6
100 Bullion........5½@5.55
150 Black Hawk........2.90
100 Chollar........6½@6½
180 California........6
120 Crown Point......5.20@5
50 Challenge........3
500 Eagle........50c
25 Exchequer........5⅞
90 Gould & Curry........8⅞
70 Hale & Nor.......12@12½
150 Independence........2½
70 Justice........4.05
100 L Bryan........75c
100 Mackoy........3
30 Mexicau........31½
190 New York.......62½@65c
60 N Bonanza....1.30@1.35
120 Ophir........24½@24½
80 Silver Hill........1¼
600 S Utah........5c
100 Solid Silver........30c
120 Tiptop........60@50c
10 Utah........15
100 Wells-Fargo........10c
250 Ward........1.10

Wed'sday A.M., Apr. 16.
285 Alpha........19½
390 Alta........5@4.95
140 Andes........40c
65 B & Belcher.......15⅞@16
645 Belcher........5⅝
510 Bullion........5⅛
50 Benton........3.10
885 Con Virginia........5½
550 California........5⅞@6
275 Crown Point........5
8350 Con Imperial..1.45@1.35
25 Confidence........15
195 Caledonia.....1.90@1.95
100 Challenge........2.95
595 Exchequer........5½@5⅝
200 Flowery........65c
410 Gould & Curry.....8½@8½
175 Hale & Nor........12@11⅞
200 Justice........3.90@4
50 Julia........3⅞
70 Kentuck........4.80@4⅞
530 Lady Bryan........70c
25 Lady Wash........85c
100 Leviathan........50c
275 Mexican........30⅞
150 Mackey........2.90@2⅞
35 Mount View........1
700 New York........60c
50 North Con Vir.....8@8⅞
120 N Bonanza......1.20@1¼
325 Ophir........24@23⅞
55 Overman........9⅞@9½
145 Potosi........3.95
40 Savage........10½
155 S Nevada........42½@42⅞
185 Silver Hill........1.10
600 Succor........65@50c
225 Scorpion........1½
200 Solid Silver........30c
1000 Trojan........15c
5 Utah........14⅞
150 Union........57⅞@57½
445 Ward........1.15@1.10
600 Yellow Jacket...15½@15½

AFTERNOON SESSION.
715 Argenta......1.60@1.65
200 Albion........25c
35 Bulwer........20@19½
250 Bodie........9½
1120 Bechtel........1⅞@1.30
100 Belle Isle........40c
625 Booker........65c
1630 Black Hawk.....2⅞@2.60
300 Belvidere........1⅞
900 Champion........25c
350 Caledonia (B H)........2½
305 O Pacific........2½@2.40
600 Day........45@40c
600 DeFrees........10c
1085 Dudley........45@40c
35 Eureka Con........16
800 Fourth July........35c
180 Gila........35c
65 Grand Prize......3.05@3
10 Golden Terra........9
685 Goodshaw........60@40c
200 Hillside........2.15
1610 Highbridge........30@25c
570 Independence...2.80@2⅞
800 Jackson........7½
1380 Jupiter........70@75c
350 Leopard........1.30@1½
250 Manhattan.....2.70@2.95
50 May Belle........25c
515 McClinton........1½
50 M White........6
405 Mono........3.10
350 Noonday........2.60@2½
575 N Noonday......1½@1.15
115 Northern Belle.....8½@8
120 Oriental........30c
200 Paradise........1½
120 Real del Monte........4
245 Raymond & Ely...4½@4½
50 Richer........70c
500 S Standard........20c
400 S Bodie........45c
700 Summit........2@2.10
300 S Bulwer........80c
140 Tiptop........70@75c
620 Tioga Con........2@2.05
205 University........50c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Apr. 10.
75 Alta........5@4.90
100 Andes........35c
110 Alpha........20
235 Best & Belcher........16½
1425 Belcher........6@5½
275 Bullion........5
250 Benton........3½@3.40
100 Brilliant........25c
180 Crown Point........5½
820 California........5⅞
655 Con Virginia.......5⅞@5⅞
210 Chollar........6½
4045 Con Imperial....1.55@1½
95 Confidence........14½@14
260 Caledonia......2.20@2.15
800 Challenge........3@2⅞
160 Exchequer........5
60 Flowery........60c
340 Gould & Curry.....7⅞@7½
525 Hale & Nor.......10½@10
90 Julia........3.90@3.85
255 Justice........4.15@4.10
25 Kentuck........4⅞
150 Lady Bryan........80c
390 Leviathan........40@45c
170 Mexican........30⅞@30½
50 Mountain View........3
330 Mackey........3.15@3.05
300 New York........65c
45 North Con Vir........8
30 N Bonanza........1.40
150 Ophir........23@22⅞
10 Overman........9⅞
120 Potosi........4.10
80 Savage........10½@10
205 Seg Belcher........31@30
885 Succor........60c
470 Silver Hill.....1.10@1.15
60 Sierra Nevada...42⅞@42½
320 Scorpion........1½
300 Solid Silver........35c
1460 Trojan........20@15c
70 Utah........15
140 Union Con........56½
110 Wells-Fargo........10c
150 Ward........1@1.10
505 Yellow Jacket...15⅞@15½

AFTERNOON SESSION.
825 Argenta........1.15@1.10
1200 Albion........15c
750 Belle Isle........40c
310 Bodie........7⅞
70 Bulwer........20½
450 Bechtel........1½
1150 Booker........50@55c
670 Belvidere......1.60@1.65
1310 Black Hawk........4½@4⅞
50 Concordia........20c
300 Champion........35c
620 C Pacific........2.70@2⅞
100 Chieftain........10c
675 Gila........30c
150 Grand Prize.....3½@3.40
550 Goodshaw........40@45c
140 Giant & O A........4⅞
100 Golden Terra........9
100 Hussey........15c
200 Hillside........2
575 Hamburg........50c
400 Highbridge.......35@40c
560 Independence....1½@1.55
100 Ida........40c
1050 Jupiter........50c
570 Leopard........1½
20 Leeds........55c
430 Manhattan......2½@2.40
75 McClinton.....1.20@1.30
500 May Belle........25c
70 Mono........3.15@3½
250 Martin White........6½
220 Northern Belle....9½@9⅞
100 Navajo........25c
200 Noonday........2.85
450 N Noonday....1.30@1.35
50 Oriental........55c
575 Paradise........1.30@1.40
50 Phenix........3
50 Raymond & Ely........5⅞
50 Red Cloud........75c
400 Richer........80@85c
100 Revenue........15c
640 Summit........2.30@2½
200 S Bodie........45c
650 S Standard........25c
530 S Bulwer........85@90c
90 Tuscarora........5c
690 Tioga Con........1.90@2
400 University........55@60c

Thursday A.M., Apr. 17.
150 Alta........5@4.90
100 Andes........40c
6 Best & Belcher........16
280 Belcher........5⅝
145 Bullion........5½@5⅛
180 Chollar........5⅞@5⅝
1410 Con Virginia........5½
2220 Con Imperial........1.40
150 Crown Point......5@4.95
100 Confidence........14
1235 California........6
150 Challenge........2.80
225 Caledonia........1.80@1⅞
620 Exchequer........5⅞
55 Gould & Curry.....8⅞@8½
70 Hale & Nor......11⅞@11½
520 Justice........3.90@3.80
510 Julia........3.65@3.50
1220 L Bryan........70c
15 Lady Wash........1
100 Leviathan........45c
170 Mexican........31½@31
65 Mt View........4⅞
205 New York........60c
420 Ophir........24⅞@24½
130 Overman........9½
150 Phil Sheridan........5c
80 Sierra Nevada.....42@41⅞
175 Savage........10@9⅞
350 Succor........55c
200 Silver Hill........1.05
45 Utah........13⅞
30 Union Con.......58@57½
910 Wells-Fargo........10c
170 Ward........1.10@1.05
165 Yellow Jacket...15⅞@15½

AFTERNOON SESSION.
1030 Argenta........1⅞@1.80
400 Belle Isle........40c
140 Bulwer........20
560 Bechtel........1½@1.35
330 Bodie........7⅞@8
600 Booker........60@65c
700 Belvidere........1⅞
100 Caledonia (B H).....2.20
200 Champion........20c
165 C Pacific........2½@2.45
200 DeFrees........5c
550 Day........45@50c
300 Dudley........45c
235 Eureka Con......15½@16
100 Hussey........20c
1450 Highbridge........30c
200 Hillside........2.10
1080 Independence .2.30@2.40
110 Jackson........7
575 Jupiter........70@75c
150 Leopard........1½@1½
100 Manhattan.......2⅞@2.80
425 McClinton.......1½@1.10
210 Mono........2.90
25 May Belle........25c
50 Northern Belle........8½
80 Navajo........15@20c
450 N Noonday........1½
150 Noonday........2½@2.35
100 Oriental........50c
80 Paradise.......1.40@1.45
150 Red Cloud........75c
550 S Bulwer........85@80c
300 Summit........2.10@2.20
50 Syndicate........2
200 South Standard........20c
970 S Bodie........40@45c
510 Tioga Con........1.70
400 University........50c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Endowment M Co	Nevada	3	25	Feb 20	Mar 31	Apr 21	R H Brown	327 Pine st
Exchequer M Co	Nevada	13	1 00	Feb 26	Mar 31	Apr 21	Joseph Gruss	418 California st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Leopard M Co	Nevada	10	50	Mar 10	Apr 14	May 6	R H Brown	327 Pine st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	Apr 19	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 15	H A Whiting	211 Sansome st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
South Bulwer G M Co	California	2	10	Feb 27	Mar 31	Apr 21	Wm Stuart	320 Sansome st
South Standard M Co	California	4	15	Feb 25	Mar 31	Apr 21	C A Sankey	331 Montgomery st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Con Dorado M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgomery st
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 16	O H Bogart	106 Leidesdorff st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 28	J M Buffington	309 California st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Howe S M Co	Nevada	1	03	Feb 24	Mar 31	Apr 21	H B Sand	404 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holdon	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 6	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Summit M Co	California	7	05	Feb 4	Mar 11	May 6	R N Van Brunt	318 Pine st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st
University G M Co	California	1	10	Mar 1	Apr 6	Apr 26	Wm Letts Oliver	328 Montgm'y st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Endowment M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 5
Golden Star M Co		J W Morgan	318 Pine st	Annual	April 26
Indian Queen M & M Co	California	Alfred K Durbrow	309 Montgomery st	Annual	April 22
Justice Con M Co	Nevada	R E Kelley	419 California st	Annual	May 5
Morning Star M Co	Nevada	Jas B Maholm	331 Montgomery st	Annual	April 29
Richer M Co	California	Wm H Lent	309 Montgomery st	Annual	Apr 29
Woodville Con S M Co	Nevada	R E Kelley	419 California st	Annual	May 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Con Virginia M Co	Nevada	A W Havens	309 Montgomery st	50	April 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	Apr 21
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

Pacific Board—Latest Sales.

Wed'sday A.M., Apr. 16.
60 Alpha........19½@19½
110 Alta........4.95
20 Best & Belcher........15⅞
150 Belcher........5.80@5⅞
70 Bullion........5½
50 Caledonia........1.95
270 Crown Point......5.10@5
625 California.....5.95@5.90
375 Con Virginia.....5½@5.40
100 Chollar........6
2760 Con Imperial......1½@1⅜
220 Exchequer........5½@5⅝
515 Gould & Curry...8½@8.15
260 Hale & Nor......11⅞@11⅝
220 Justice........3.90@3.85
100 Julia........3.80
130 Mexican........30⅞@30½
300 New York........60c
255 Ophir........24⅞@23⅞
100 Potosi........3.95
150 Savage........10½@10½
90 Silver Hill........1.15
40 Sierra Nevada...42⅞@42½
20 Utah........15
20 Union Con........57½
80 Yellow Jacket...15⅞@15⅞

AFTERNOON SESSION.
100 Argenta........1⅝
30 Bechtel........1.40
50 Black Hawk........2⅞
80 Bullion........5
10 Best & Belcher........15⅝
70 Caledonia......1.90@1.85
600 Con Imperial....1.30@1⅜
310 Exchequer.......5.10@5½
100 Flowery........70c
30 Gould & Curry........8½
30 Hale & Nor........11
250 Julia........3.65
50 Leopard........1½
200 Manhattan........2.90
20 N Bonanza........1¼
195 Ophir........23@23⅞
10 Overman........9⅞
100 Phil Sheridan........6c
20 Savage........9⅞
100 Silver Hill........1.15
130 Ward........1.10@1.05
20 Yellow Jacket........15⅞

California Board—Latest Sales.

Wed'sday A.M., Apr. 16.
600 Ætna........7c
30 Alpha........20@20½
40 Alta........5@5.10
300 Atlanta........2c
100 Bechtel........1.40
30 Belcher........5⅞
20 Best & Belcher....16@16½
50 Bullion........5½@5½
30 Chollar........6½
40 Con Virginia......5⅞@5½
20 Con Imperial........1½
90 Crown Point......5@5.05
40 California........6
90 Exchequer........5⅞@5½
100 Fairfax........1
50 Gould & Curry.....8½@8⅞
250 Glynn Dale........1
40 Hale & Nor....12@12.05
50 Julia........3.95@3.90
40 Justice........3.85
20 Mexican........30⅞
60 Ophir........24@24½
100 Phil Sheridan........6c
40 Savage........10½@10⅞
40 Sierra Nevada....43@42½
50 Scorpion........1.55
110 Silver Jacket........75c
110 Silver Hill........1.20
40 Union........59@58⅞
3000 U Flag........4c
60 Yellow Jackot..15½@15⅞

AFTERNOON SESSION.
100 Almaden Q........1c
500 Alexander........4½
300 Ætna........7c
4400 Atlanta........1c
50 Alpha........19½@19⅞
50 Alta........5@5.10
150 Boston........2.@2.10
30 Belcher........5⅞@5⅞
40 Best & Belcher....15@15½
30 Bullion........5½
30 California........5⅞
35 Con Virginia.......6½@5½
200 Con Imperial........1.45
40 Crown Point........5@5⅞
2500 Coso Con........5@3c
40 Caledonia........1.90
50 Exchequer........5½@5.20
45 Gould & Curry........8½
500 Globe........5c
30 Hale & Nor......11⅞@11⅞
30 Julia........3⅞
30 Justice........3.90
100 Kossuth........20c
55 Mexican........30½@30⅞
50 Ophir........24@24⅞
40 Potosi........3.90
40 Savage........10½@10½
40 Sierra Nevada....43@42⅞
100 S Bodie........50c
40 Union Con........57
100 Wales........1½
20 Yellow Jacket....15@15½

A CABLE will be laid in the course of a few days across Saanich Arm, connecting the land wires of the telegraph line now being completed between Victoria, B. C., and Nanaimo. The length of the cable will be about two miles.

The Tramp Nuisance.

The legal method of dealing with the tramp nuisance is urged by many of our readers in different parts of the State, and, indeed, there seems no other way to free the community from the fear and depredations of this race of outlaws. They will not work; we speak of the mass, of conrse they are sometimes honest work-seekers on foot. The only way the community can force them to earn their own living is to make them criminals and their occupation an offense against the law. This method has been in practice for a year or more in some States, notably in New Hampshire, and the result has been most salutary. Other Eastern States are adopting laws to protect their citizens from the tramp tribute, and their methods of legislation may be of interest to those who are thinking of similar movements in this State. The New York State Legislature has lately adopted an act which declares that all transient persons who rove about from place to place, and all vagrants living without labor or visible means of support, who stroll over the country without lawful occasion, shall be held to be tramps, and any person who shall be deemed to be a tramp shall be liable to punishment of not more than one year's confinement at hard labor. Any tramp who shall enter any dwelling house or kindle any fire in the highway or on the land of another without the consent of the owner or occupant thereof, or shall be found carrying firearms or other dangerous weapon, or shall threaten to do any injury to any person, or to the real or personal estate of another, shall be punished by imprisonment at hard labor in the State prison for not more than two years. Any tramp who shall willfully and maliciously do any injury to any person or to the real or personal estate of another and which offense is not now by law punishable by imprisonment in a State prison, shall be punished by imprisonment at hard labor in the State prison for not more than five years. Any person being a resident of the town where the offense is committed may apprehend the offender and take him before a justice of the peace for examination. The act does not apply to any female or to any minor under the age of fourteen years or to any blind person, nor to any person roving within the limits of the town in which he resides.

It would seem that some better method of forcing these men to support themselves could be found than the above. In this State, for example, the expense of transporting tramps half the length of the State and supporting them in the State's prison would be a grievous tax upon the people. The better plan, as it seems to us, would be to arrange some plan for putting the tramps to work where they are, and localize the system in each county. Thus, for example, the tramps might be marshalled into gangs under suitable guards to repair the roads they do so much to wear out. Or they might be farmed out to execute improvements of different kinds, public or private. We do not claim to know what would be the best way to remedy the evil by enactment, but that will doubtless appear if people will give thought and discussion to the subject.

Mining Share Market.

As usual, of late, the market for the past week has been neither one thing nor the other. There has been rise and fall, but both of so slight a nature as to be almost ridiculous, especially as being in the face of good developments, which at other times would create a strong and buoyant appreciation in the market. The outlook can hardly as yet be said to be perfectly satisfactory, but the increasing activity in the boards, and the slight hardening of values for favorite shares indicates beyond doubt that the crisis has been passed, and a better condition of things inaugurated. The Comstocks have shown more life, Ophir especially rising appreciably under the report of a new and rich strike. The trading in Bodie stocks has also been large, Bulwer being the most active in the advance. No real increase in business or improvement in stocks can be looked for till the agitation attendant on the coming Constitutional election has time to subside, and until such time we shall have to put up with the present dullness and patiently await the end. The firmness which characterized the early part of the week gave way gradually toward the end to a weak and vacillating close, there being a general depression all along the line.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Martin White, April 6th, $7,888.84; Hillside, April 13th, $4,820; Martin White, April 9th, $5,110; Paradise Valley, April 11th, $2,740.19; Independence, April 14th, $6,500; Bechtel, April 13th, $11,500; Manhattan, April 12th, $11,500; Alexander, April 12th, $8,307; Caledonia, April 9th, $6,086; Northern Belle, April 9th, $9,000; Leeds, April 8th, $4,300; Tiptop, April 8th, $21,000; Con. Virginia, April 7th, $24,536; California, April 8th, $43,029; Martin White, April 9th, $5,110; Highbridge, April 15th, $4,700.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Mahoney.—*Ledger*, April 12: A new shaft is being sunk for working just outside the Mahoney boundaries, as the control of the mine is still a subject of litigation. By the time the shaft is sunk the lease will have expired, and the mine will fall into the hands of a majority of the stockholders.

Miscellaneous.—The managers of the big tunnel at Volcano have suspended operations for a time. It was falsely represented to the company who recently purchased the tunnel property that a large area of land was included in that property. They do not propose to proceed any further with the work until they find out the true condition of affairs. The Amador Con. mill of Sutter creek is crushing rock taken from the old dump pile. It has paid handsomely so far. Some of it has yielded as high as $7 per ton. The last clean-up of the Downs mine, at Volcano, turned out $34 to the ton. The rock carries very fine gold, and requires pulverizing very thoroughly, the mill averaging about a ton to each stamp per day. At the St. Louis mine, on Kennedy flat, work is being pushed ahead. Samples of ore taken carelessly from the dump showed free gold plainly visible to the naked eye. The Keystone and Little Amador companies paid off this week, and money is now plenty in town. The Phœnix mine stopped working recently—no timbers. The mill also came to a standstill, the dump pile being exhausted. A big drive of timbers is expected down soon. The mill has resumed work. Water in the Hercules has decreased considerably. A fine ledge is uncovered in the shaft, and the prospects are very flattering.

MONO

The Bulwer.—*Standard*, April 11: One of the richest things yet struck in the Bulwer ground is now being drifted on in a southerly direction on the 200 level. It is over two ft wide in the face, and exceedingly rich It is a part of the Homestake-Ralston series, and promises a big output of bullion in itself, regardless of what is in sight elsewhere. About 50 ft west in the crosscut, 400 level, running for the Stonewall, a large lode—full four ft wide—of superior looking, clean quartz, was passed through. Only within a day or two has the drifting been under way, but the outlook of the ledge is already mere favorable than was anticipated.

The Standard.—The chains have been finally got in place at the 700 level, so that the safety cage can be regularly employed to that depth in the new shaft. The crosscuts, driven by the air compressor and patent drills, has reached 20 odd ft both east and west. The ground to the west has materially softened. The winze on the West Standard, or Bruce ledge, has reached a depth of 55 ft, and has 18 inches of the well-known rich ore. The main old lode, as drifted on north from the main shaft crosscut east, is looking better than ever; is nearly five ft thick of high-grade ore.

The Belvidere.—The winze on the great Western, started for the purpose of determining the extent of the rich ore body, is down 30 ft. It is proposed to sink 50 ft, and then drift. The crosscut pushing west by the Bulwer company, to cut the Stonewall, will connect with the Belvidere works; the Bulwer tunnel, of course, will pass through the ground, and altogether it will be very soon quite thoroughly explored to a depth of 400 ft vertical.

Indian District.—The parties having the Neal mine bonded have returned all the papers to the owners, Messrs. McBride & Neal, and the latter are free to act as they may think best. It is likely that a thorough mill test of the ore will be made, and it will be singular indeed if the result does not prove satisfactory. At the scene of the recent excitement, Chidago, prospecting is still going on. A shaft is down on the Chidago about 15 ft deep on the line of the ledge, where the same rich character of ore is obtained. Work is not yet advanced far enough at any point to finally determine the extent and value of the discovery. At the Sultan Hill camp there is more doing than at any other point in the district, outside of the Tower mine. The Sultan Hill camp is about one and one-half miles in a direct line south of the Tower, in the silver belt, though the company also possess claims in the gold belt above, in which the Neal is located. The company have six or eight locations on the silver belt, several of which are self-evidently very valuable properties, notably the Viceroy, on which work is at present centered. Capt. Prescott, the superintendent, has made rapid progress in getting things started on a permanent basis. It is the intention to push down a prospecting shaft or winze on the line of the Viceroy ledge, which is apparently the chief lode of the belt, and of great size—30 to 40 ft in width. More or less prospecting work will be done on the other claims, but the Viceroy alone gives promise of making a silver mine of sufficient importance to satisfy most any single incorporation. Among the other locations are the Madison, Sultan, Czar and Walla Walla, all valuable—the latter especially possessing all outward indications of great size and importance.

Laurel Hill.—*Mono-Alpine Chronicle*, April 12: The mines on Mt. Wasson are well defined. The f X L, Bullion, Milner, and two other locations, are on one lode. The walls are hard lime slate, raising from 30 to 40 ft above the level of the ground, and are easily traced thus for over two miles. The ledge matter between the walls is 150 ft wide, assaying well in gold and silver. The Baltic, Whale and other mines on the same mountain are also worthy of special mention; and so, also, are the Eureka, Eva, May, Richmond, Star, and many others, such as the Mineral Chief, Mineral King and Phonograph, that assay well, and await nothing but stamps to turn out bullion. The most of the ore in Laurel Hill district will have to be roasted, but as there is plenty of wood and water, that will be accomplished with a very small outlay, and will be more than repaid by the richer yield of the ore. The country rock is lime, porphyry, quartz and considerable iron. The ledges are very large, some of them, as the Emma, Annie and Nelson, etc., averaging from 100 to 200 ft in width. The ledges uncovered in some of the canyons have bluffs of ore raising to a height of 400 or 500 ft, almost perpendicular, with a breadth of 200 ft. The ore will average over $30 per ton, across the whole bluff.

NEVADA.

Mining Notes.—*Foothill Tidings*, April 12: The Milton water and mining company, at French Corral, in this county, yielded $17,431 in February and $43,321 in March; a total of $60,752 for the two months. It is probable that dividends will be resumed this month. The Derbec and Pattison quartz ledge, on the South Yuba, near Washington, is 300 ft wide, and assays from the croppings give from $6 to $40 per ton. Very little gold is now being brought into Nevada City, owing to the large mining companies putting off their clean-ups until the end of the season. Blue gravel has been found on Gold flat, near Nevada City. Mr. Talbot prospected the lead some 200 ft, and the gravel is from two to six ft deep and rich in gold. A powder blast, consisting of 250 cases of Judson powder, was exploded in the American on last Wednesday. This blast was a successful one, tearing and loosening the ground for considerable distance. The Merrifield ("Soggs") mine is running in full blast. Large quantities of fine ore are being hoisted, and the prospects continue to grow more and more encouraging as each new development is made. A blast in the ledge at the bottom of the Scaddeu Flat incline discloses some magnificent rock, which one of the stockholders describes as "almost solid gold." The prospects of the enterprise are constantly improving, and the owners feel quite jubilant over this latest development. The pumping machinery on the Knight of Malta is about ready to start up, after experiencing much delay on account of bad weather. In order to put new blocks in one of the Manzanita mine flumes recently, a partial clean-up was made, and it came up to the Superintendent's expectations. Work in the Alaska mine has been suspended, but the pumps are kept going. The stoppage is believed to be but temporary. The Excelsior mining company, at Smartsville, has declared a dividend amounting to $11,000, payable on the 20th inst. The contractors who are putting down the new shaft at the Washington quartz mine are making excellent progress, and will soon complete their contract.

Gigantic Ledge.—*Transcript*, April 12: The Derbec and Pattison ledge is situated on the South Yuba river, near Washington, in a direct line about 11 miles northeast of this city. The fissure is no less than 300 ft wide on an average, and is solid ore matter the entire breadth. The casings of this monstrous vein, which is one of the largest on the coast, are of serpentine with outer strata of greenstone trap. The country rock is of graulte formation. Assays of ore excavated at random here and there from the croppings, yielded from $6 to $39.75 per ton. It is, generally speaking, free milling quartz, being red ochre with chromic acid and not accompanied with arsenical iron, zinc blende or base matter. A tunnel 1,500 ft in length, from the river, would give at least 1,000 ft back. By running a tunnel 600 ft from Brandy creek, it would give a back of 700 ft. The ledge has been located by the present owners for the distance of a mile.

Schmidt Mine.—*Herald*, April 12: Men are at work at the Schmidt mine grading and excavating preparatory to putting up steam hoisting works. The new incline has been started, and is at present being sunk with the aid of a windlass, which will answer every purpose till the machinery is put up. Messrs. Sheecraft & Sprague recently purchased this mine from the original owners, and it is their intention to erect hoisting works capable of sinking 1,000 ft, and to open up and thoroughly develop the mine. It is well known that there is a good ledge there, but the machinery heretofore used in pumping and hoisting was not powerful enough to admit of the deep working of the mine, and consequently its real value has never been ascertained. The old inclines were down to the depth of 60 and 120 ft, respectively; the ledge in the latter is three ft. The machinery will be in place and the mine in complete running order in about two months.

Jottings.—*Transcript*, April 12: The Omega Con. hydraulic mining company is running with full force. They have three monitors throwing water against the bank, and are making good progress in washing off the ground. The claims are under the superintendence of Mr. R. O. Tully, and he employs white men exclusively. There are at present only 10 men at work in the mine. Some prospecting is being done in that vicinity, but it requires capital to operate in opening up the deep channels found. The Arthur mining company have struck the richest kind of ore, and considerable of it, in their mine in Mount Rose district. The Brunswick mining company, who work from the same shaft as the Thomas company, have been embarrassed financially to such an extent as to necessitate temporarily shutting down. The Wyoming company have a fine ledge which varies from 10 inches to 6 ft in thickness, and the rock pays about $17 per ton in free gold, while the sulphurets go from $98 to $103. The machinery is run by water power, and the mine can be worked very cheaply.

PLACER.

Brief Notes.—*Herald*, April 12: The Central cleaned up between $5,000 and $6,000 for 10 days' run. There is the least expense attached to this claim of any claim in this district; no powder being require to break up the bank. The Southern Cross also cleaned up last week, the amount not ascertained, but it was very successful. Work has been resumed on the old Bellevue mine, near Crator hill. A shaft 50 or 60 ft in depth has been sunk, and a well-developed ledge was struck last Tuesday. Some half a dozen men are employed there.

SHASTA.

Big Thing.—*Independent*, April 11: A rich ledge has been discovered near Slick Rock, about three and a half miles from the Conway location, which, from all accounts, beats anything yet discovered. The ledge is owned by William Murray, E. O. Baker, Fred Ten Eyck, and Mr. Vandevear. Mr. Murray says that he has drawn a line over the ledge to a distance of 1,000 ft, and that it will average three ft in width, the rock in some places assaying as high as $1,000 to the ton. It is composed of rotten quartz that is completely speckled with gold.

SIERRA

Items.—Downieville *Messenger*, April 5: The Highland Mary tunnel, at Wahoo, is now in about 900 ft. The rock is much more favorable to rapid progress than it has been at any time since the work started. The "boys" at Monte Cristo are busy as bees, and intend, as the Orangers say, to "make bay while the sun shines," But little snow is left, and the trail is now shoveled out clear to the mine. There was a cave in the Dutch company's diggings, Loganville, last week, and the monitor was buried in debris.

TRINITY.

Splendid Clean-up.—*Journal*, April 12: Deadwood district gives promise of being one of the richest quartz sections on this coast. Last week a 91-ounce clean-up in the Vermont mine paid at the rate of over $50 to the ton. This week, Frick & Davis have eclipsed that, as they show $4,900 from 43 tons of rock crushed in an arastra. The Monte Christo and other mines in the district are reported as looking splendidly.

NEVADA.

WASHOE DISTRICT.

Belcher.—Gold Hill *News*, April 16: During the present week, 20 ft will be added to the depth of the main incline, and less than 90 ft now remain to be run, on the slope, to reach the 2760 level. Crosscut No. 1, 2500 level, opposite the incline, is making six ft per day, but has not yet reached through the casing of the vein. It is cutting some quartz and clay, as well as porphyry, and is in a magnificent formation. Work in the south drift, 2500 level, has been resumed. The crosscut on the south line, 2360 level, is making five ft per day, and is in 90 ft, yet has not reached the vein.

Ophir.—The main incline is averaging two ft additional depth per day through a very favorable vein formation. The bottom is to-day 15 ft below the 2300 station set. ft will be continued for a sump before the station is excavated. Work in the joint Mexican upraise from the 2100 level is making but one and a half ft per day owing to the extreme hardness of the porphyry.

California.—The joint drift, west, on the 850 level, is in 30 ft and averaging three ft per day. Connection has been made between the joint winze from the 1950 level and the upraise from the 2150 level. The C. & C. shaft is 16 ft below the 2350 level. Average daily yield of ore for the past week, 222 tons.

Yellow Jacket.—The new shaft is down 2407 ft perpendicularly. The main east drift on the 2400 level is in 126 ft, and is cutting quartz and porphyry through which some water is seeping.

Bullion.—The crosscut, 2150 level, is in 120 ft and penetrating a mixed formation of clay, porphyry and quartz. The work of chambering for the winze engine is still going on.

Sutro Tunnel.—On account of the impossibility of getting the debris out of the way with the present facilities a portion of the men employed have been discharged. There still remain 600. In three shifts of 200 each. The work of cutting out the sub-drain is making good progress.

New York.—The incline is completed to the 1200 level and sheaves are being put in at the station at the head on the 1040 level.

Mt. Hood & Vancouver.—Some 400 ft of water accumulated in the shaft during repairs; is being bailed out preparatory to taking up work on the 1400 level.

Alta.—The rock in the joint Benton incline winze is getting harder, still the 1750 level will be reached next week.

Exchequer.—The north drift, 2400 level, is in 354 ft and is averaging four ft per day through fine-looking vein matter.

Justice.—The north parallel drift between crosscuts 4 and 5 has been discontinued, and a drift has been started on south from crosscut No. 5, which is showing streaks of ore as it goes along. Only a little ore is being taken out of the surface workings of the Waller Defeat. Prospecting there is still continued. Spots of very rich ore are encountered in places.

Ward.—Laying the track and repairing the drift, 800 level, was completed Sunday, and work resumed in the face at noon of that day. Sinking is going on more rapidly since the water which had soaked into the ground has drained out.

Trojan.—Five ft per day have been added to the north-east drift from the 3d station, the face being 133 ft beyond upraise No. 5. The west drift on this level is in hard porphyry. The north drift from the 2d station is advancing rapidly in low grade ore.

Hale & Norcross.—The lighining drift to the Chollar-Norcross-Savage shaft, 2000 level, and that on the same level connecting with the Savage, have been prepared to receive the water. The water is still kept below the 2000 station.

Dandanelles.—The work of sinking the new shaft has been retarded by the character of the rock in the bottom, which for the past few days has been very hard and difficult to work owing to the frequency of seams, rendering close timbering necessary.

North Bonanza and Flowery.—No work has been done from or below the second station since Sunday. An engine and blower and a five-inch Dean pump, capable of handling 402 gallons of water per minute, are being placed in the station. On the surface the pipes are all in and the steam connections made with the new engine.

Silver Hill.—The main incline is still being continued on down, and work is going on as usual in the east drift, 1100 level. No material change of formation has occurred at either point.

Savage.—Retimbering the incline below the 1640 station, and pumping sufficiently to keep the water below the 2000 level.

Con. Virginia.—Average yield for the past week, 253 tons daily. The joint west drift, 850 level, is averaging three ft per day. The joint drift to the C & C shaft, 1650 level, is still being enlarged and retimbered. The joint west drift, 2150 level, is making five ft per day in favorable working ground.

Union Con.—The joint Mexican winze from the 1600 level is down 370 ft on the slope, in promising vein matter containing some water. The north drift, 2000 level, is averaging five ft per day, and is now 122 ft in Union ground. The rock is getting harder.

Gould & Curry.—The bulkhead on the 1900 level is being constructed. Four ft per day are being added to the joint east drift, 1700 level. The Osbiston shaft has been drained and the work of sinking will be resumed as early as Sunday. The drain tunnel is making about eight ft per day.

Lady Bryan.—Sinking is still going on, the bottom of the shaft being 130 ft below the 600 level. The drift north, 600 level, is in porphyry. Two 12-inch plunger pumps and 500 ft of column are being procured for use in the mine.

Crown Point.—The drift north, 2500 level, has been discontinued for the present. A crosscut east is being run jointly with Belcher, and is making good progress. It has not yet reached the vein.

North Con. Virginia.—The shaft has reached the 1700 level of the Sierra Nevada, where sinking has been discontinued till the repairs necessary to certain portions above are completed.

Con. Imperial.—The drift north on the 2600 level has been discontinued till the south drift, same level, has reached the Yellow Jacket workings.

Chollar-Norcross-Savage Shaft.—The pumps have not been run during the week. The water has raised so as to flow through the lighting drift to the Hale & Norcross, having been over 80 hours in raising 45 ft.

Beer & Belcher.—The drain tunnel to the Osbleton shaft is in 335 ft, and has 60 ft yet to run to connect. Sinking in the shaft will soon be resumed.

Julia Con.—The water has been lowered to the 2000 station. Pumping will not be stopped by the work of cutting the sub-drain to the Sutro tunnel. The work of sinking the winze from the 1800 level is slow, owing to the intense heat.

Utah.—The incline is to-day down 412 ft on the slope below the 1350 level, and is being continued. The partition in the incline has been carried to the bottom, and gives fine ventilatiou there.

Overman.—The O & C shaft is down 575 ft. A tank has been put in at the 550 level and the water all caught up there. Steam pumps have been also put in and are throwing the water to the surface. The water is being rapidly exhausted.

Mexican.—The joint upraise above the 2100 level is now up 80 ft. The joint Union upraise from the 2000 level to meet the joint winze from the 1000 level is averaging three ft per day in a fine vein formation, through which some water seeps.

Homestead.—The joint drain and working tunnel of the Homestead, Golden Standard, and Wheeler mines is making good advancement. The tunnel is being made seven ft in width and eight ft in hight.

Sierra Nevada.—The incline is making slow progress on account of the water flowing in at different points, the amount being all that the pumps can handle.

BELMONT DISTRICT.

Belmont.—*Courier*, April 5: The mine presents a marked improvement. They have started a winze from 300 level drift, on the pocket of ore lately spoken of, and are now 20 ft below the level in pay ore all the way. It is a continuation of the Moore & Martin chimney, and the chances for its going down to the 400 level are most encouraging at the present writing. In the south raise north end the air got so bad that they had to quit work and commence drifting from same to make connection with the 300 level drift which will take from 30 to 40 days. The 300 level drift running north is very hard, and they are making slow progress. Drift from raise on same level is making three and a half to four ft per 24 hours. The ore extraction for the next four ft per day will be light, as some openings have to be made before they can take out the ore to advantage. Have shipped 20 bare bullion, value, $9,073.23.

Higginbotham.—The ore bodies continue yielding very rich ore for reduction. The prospecting drifts show no material change. Have advanced the 6th level 35 ft south and 44 ft north. The 7th level 21 ft in hard blasting ground, making 100 ft of drifts run for the week ending this date. The mill resumed crushing Highbridge ore on the 1st.

EUREKA DISTRICT.

Secret Canyon.—*Sentinel*, April 12: The Oeddes & Bertrand mine is now worked under a lease. The main shaft is down 320 ft. Twenty ft above this point a level was opened and the drift is in 200 ft. The formation encountered is blue quartz, and pockets of rich ore are frequently opened up which go from $600 to $800 per ton. On the 75 level the drift is in 50 ft, and a winze driven down near the face has reached a depth of 20 ft. A shipment of 22 tons will take place in a few days which, it is thought, will average $250 to the ton. There is some water in the bottom of the shaft, and every Sunday the hoisting works are started up and the water hoisted to the surface. There are four claims in the Silver Cate Con. The main incline has reached a depth of 120 ft, with a very pretty ledge in the bottom. The vein, which was followed all the way down, at the widest part was three ft, but averages two ft in width. There are 30 tons of fine ore on the dump, assays from which run $105, $245 and $207 per ton. The ore in the bottom of the incline is not quite so high grade as that taken out at a less depth, yet at the time of our visit the prospect of opening up a large body of ore was very favorable. A tunnel sight was located, by means of which it is intended to thoroughly prospect these claims at a great depth. The Hogdon was the first claim located in Secret canyon, and over $30,000 was taken out within 15 ft of the surface. There are three shafts—one 234, one 170 and the other 75 ft. No crosscuts have been started in the 230 shaft. The croppings are high up and fair assays have

(Continued on Page 260.)

The Flounders of our Markets.—No. 2.

[Read by W. N. Lockington before the San Francisco Academy of Sciences, March 17th, 1879.]

Glyptocephalus pacificus, nov. sp.—On visiting ths market on the 13th of March, I found among the small flat fish exposed for sale two small specimens, which, from their excessively elougated form, and tbe considerahle thickness of the hody, seemed new to me.

These fish were between eight and nine inches long, their width was hut little more than a fourth of their length (a most remarkable proportion for a flounder) and the short head was less than the greatest depth; the moutb was very small, the lateral line quite straight; the scales minute and quite smooth; and the color dark blackish gray, with ths tips of the fius darker, approaching black.

Ths dorsal fin, as might he expected from the proportions of the fish, was exceedingly elongated and contained many more rays than that of any other of our flat-fish, the two specimens having respectively 102 and 104 rays. The anal fin was correspondingly elongated and contained 84 rays in one, 87 in ths other.

The teeth, twelve in nuniher in the lower, and nins or ten in the upper jaw, were hroad and flat, with a cutting edge, like ths incisors of a mammal, and formed a close row along the jaws on the blind side and in front, while there were none upon the colored side.

On inquiry I ascertained that a much larger individual, 14 inches or more in length, had been in the market the day before.

As I have never met with this species hefore, notwithstanding my frequent visits to the market, I coucluds that it must be of rare occurrence. Nothing at all like it has been described from tbis coast by Girard, Ayres, Gunther or Gill, and Prof. Jordan does not mention it in a list of the flounders which he was so kind as to send me.

It agrses, however, in the length of the dorsal, elongated body, smooth scales, and straight lateral lins, with ths genus *Glyptocephalus*, and I havs accordingly prepared a technical description of it under the name of *G. pacificus*.

Hypsopsetta guttulatus; Parophrys Ayresii, Gunther; *Pleuroniehthys guttulatus*, Girard.—This fish, ths "Turhot" of our market, is one of the commonest of our flounders, but is usually of small size. Occasionally, however, individuals are taken weighing as much as five pounds, and measuring 18 iuches in length. The color alone is sufficient to distinguish it from every species. On the colored sids it is, when quite fresh, of a dark olive green, sometimes hlotched witb irregular whitish spots. By exposure to the air the color deepens to nearly black. Ths under side is opaque white, liks white lead, hut along the margin of ths head from some distanes above the eye, and continuing to the anus, is a border of hright gamhoge yellow, broadest and brightest upon the snout and lower jaw. Sometimes ths whole of the under surface is yellow. It is a very broad species, in this respect rivalling and exceeding *Platichthys stellatus* (the "Flounder"); the width being nearly or quite half of the breadth. Another characteristic may be found in the teeth, which, instead of bcing a single row, form several rows, a character shared only hy one other of our flat-fish, *Pleuronichthys coenosus*, which differs widely in the color, as well as in having ths dorsal fin continued downwards along the blind side of the head, and in the very much larger eyes.

In several specimens the rays of which I counted, I found the number to agree with that given hy Gunther, viz.: 66 dorsal, and 47 anal. An individual which has been in tbe Museum a long time has, however, 72 dorsal, 54 anal rays, rather a larger variation than usual, but as I can detect no otber difference, I conclude they are the same species. Girard describes a spscies which hs named *Pleuronichthys guttulatus;* the nuniher of the fin rays of dorsal and anal in this was respectively 67 and 47; and the color "grayish or lead, sprinkled all over with black dots and white spots." After this, Dr. Gunther received ssveral specimens which he descrihes as *Parophrys Ayresii*, placing it in a different genus from Girard's species. Now Girard's *guttulatus* came from Tomales hay, and certainly ought therefore to bs found in our markets. Ths fact that I did not meet with it led me to examine and compare the descriptions of these two authors, and my conclusion is that Girard's *guttulatus* and Gunther's *Ayresii* are ths same species. In this case, the oldsr specific nams, *guttulatus*, will of course taks prscedsnce.

Pleuronichthys coenosus, Girard.—This is a very rare species, and evidently inhahits deep water, since the eyes of those I have seen protrude from their sockets, tbrough the sudden change from the pressure at the depths wbere they resided to that of the surface.

There are three characters ahout it which reuder it impossible to coufound it with any other species; the very large eyes, which equal or exceed in diameter one-third of the length of the head, from the tip of the snout to that of the gill-covers; the very short, snub suout, scarcely projecting heyond the protruding eyo; and the siugular course of tbe dorsal fiu, the front part of which, instead of endiug upon the dorsal ridge somewhere over tbe eyes, as in other species, curves over at that point to the blind side of the fish, and continues downwards along that side till it reaches a poiut level with, and not far from, the end of the maxillary or upper jaw. About eigbt rays are thus twisted over to the left side. The color also, a uniform warm reddish brown, is very distinctive. Tbe teeth, like those of the last species, (*H. guttulatus*) are in several rows, and in ths form of the hody and fins the two kinds are also much alike.

Girard's original description was drawn from a single specimen, the only one he had seen, and as yst I have only met with two individuals. It is taken near the Farallones.

Parophrys vetula, Girard.—It is difficult, without thorough examination, to distiuguish this species from its congener, *P. digrammus;* hut from all our other *Pleurenectidæ* it can be known by its elongated head, with the upper eye placed upon the dorsal ridge, so as to look obliquely upward as well as laterally; hy its elongated rhomhoidal form, the outliue of the posterior portion of the hody heing nearly straight; and by the development of the teeth upon the blind side, where thcy form a single row. In color it is usually of a uniform reddish ash, hut some of the younger individuals are irregularly spotted with darker hlotches. On tbs hlind side it is of a creamy white. The nuniher of rays in the dorsal and anal fins is not constant. In the species of *Parophrys* the upper eye is so close to the dorsal ridge that it looks obliquely upwards. So far as I have been able to ascertain, this species, together with *P. digrammus*, is not taken within the Bay of San Francisco. As the fishermen have not thought proper to give any specific English name to this species, I propose to call it ths Long Flounder. The form which, from its near correspondence with the *Pleuronectes digrammus* of Gunther, I suppose to be that species, is chiefly distinguished hy its shorter head, narrower snout, and the smaller numher of rays in ths dorsal and anal fins. The number of dorsal rays which I have found in specimens which I refer to, *digrammus*, varies from 74 to 77; that of the anal from 54 to 60. Gunther gives the dorsal 79; the anal 60. In the specimen I refer to, *vetula*, I find 86 dorsal rays, and from 64 to 68 anal rays; the numher of dorsal and the smaller number of anal rays agreeing with those given by Girard. As, bowever, I counted an intermediate number, 81, in ths dorsal fin of another specimen, I am not quite sure whether the species are distinct, or whether it is one very variable species.

Lepidopsetta bilineata, Jordan; *Platessa bilineata*, Ayres.—The first description of this fish will he found in the "Proceedings of the Cabfornia Academy of Sciences," Vol. 1. It is one of ths numerous forms described hy Dr. Ayres, and has always been oue of the rarest and least kuown of our fishes, very little having been added to our knowledge of it since Ayres wrote. It may he readily known from every other kind found here by the following characters: Many of the scales upon the body are ctenoid, that is, set upon their hinder edges with spinules; those on the cheeks are tubercular or roughened with hluntish points upon a large part of their surface; ths form is regularly oval, the width of the body almost equal to half of the total length; and the color is a quite light yellow, with irregular white spots. This last character, with the very rough cheeks aud large, rough scales, serves to infallihly ideutify the species. As in so many other of the more nearly related flat-fishes, the teeth, whicb are in a single row, are not equally developed on the two sides of the jaws, hut are principally upon the hlind side. The eyes are large, forming two-sevenths or the length of the head. This species is only occasionally brought to the markets, where, with two species previously mentioned, it bears the name of "sole." Those brought are usually of tolerahly largs size, from 14 to 15 inches long; and are caught at or near ths Farallone islands, though probably not in such deep water as *Pleurounhthys coenosus*, since ths eyes do not protrude, as is usually the case with thc eyes of fishes suddenly brought up from deep water.

Lepidopsetta umbrosa; Pleuronectes umbrosus, Girard.—This species, notwithstanding its very rough covering of highly ctenoid or comh-like scales, is by the dealers confounded with the two species of *Hippoglossoides* under the common nams of "sole." In reality it is most nearly related to the Mottled Sole from the Farallone islands (*L. bilineata*), sharing with it ths charactsrs of rongh scales aud lateral lins considerably arched above the pectoral fin. From that species it may bs very readily distinguished by its color, which is of a dark, uniform, slaty hrown; and from all othsr speciss by ths combination of the two characters first mentioned, together with its regularly ovate form and small, quits laterally-placed, eyes. It does not appear to bs very common, as I rarely find ahove two or three specimens among a miscellaneous heap of flat fishes. Those I have yet seen have not exceeded 10 or 11 inches in length.

Platichthys stellatus, Gunther; *Platichthys tugosus*, Girard.—This species, commonly called Flouuder, is by far the most abundant of the kinds brought to our market, and attains a larger size thau any otber except the Bastard Halibut (*Uropsetta Californica*). The eyes and color, are sometimes on the right side, sometimes on the left, while in all our other species they are always on the same side. It may be easily known by its short, broad form, the width exceeding somewhat the half of the length (excluding thc caudal fin); by the presence, instead of scales, of scattered, rough, stellated tubercles; and by the hlack hands upon dorsal, anal, and caudal fins; four upon the first, three upon the secoud, and three upon the last, all of them running in the direction of the rays.

This species is of wide distribution, occurring along the coast of Kamtschatka, and from thence extending by Behring's straits, Alaska, and British Columbia southward to San Francisco. How far it may occur to the south of the latter point does not appear to he known with certainty, but as it is cvidently a northern form, it is probable that its southern limit will he found near Monterey, at which point there is a mingling of northern and southern forms, resulting in an extremely rich local marine fauna; rich not only in species of fishes, but in mollucca, echinoderms, and cœlenterates.

The flounder occurs within the Bay of San Francisco, and is brought to market not only from thence, hut from various points outside the heads; some are even sent from Humboldt bay, but it is said that these are far coarser than those ohtained slsewhere, with comparatively less meat, and fetch a much lower price in the market. Thoss taken here attain a weight of 8, 10, or even 12 pounds, hut thoss sent from Humboldt hay are much heavier.

[Concluded.]

Railroad Prospects.

Dr. D. S. Baker, of Walla Walla, inteuds pushing his railroad eastward toward the Blue mountains the present season, with a view of crossing the mountains into Grand Ronde valley. The short railroad already built hetween Walla Walla and the Columbia river has proved a grand success, and has so completely demonstrated the necessity and utility of a railroad to connect the farming country witb the river that the extension eastward of this line is awaited with much anxiety. Once completed across the mountains to La Grande, an immense local trade would spring up, which would soon repay the expense of building the road. Apart from all other business, that of transporting lumber and timher from the Blue mountains for huilding, fencing, fusl and other purposes would of itself he a very important element of trade. The only serious engineering difficulties would be encountered in crossing the mountaius, and these have been fully ascertained hy accurate surveys and careful estimates, and are known not to bs at all formidable. Once in the Grand Roude valley, the road would be pushed eastward in this direction, and would not stop until it was met hy the Utah Northern, or some other road advancing from the east.

The peopls of Pendleton are urging the completion of a railroad east from Umatilla through that place. This enterprise is thought to bs in the hands of the O. S. N. Company, which is intsrested in making the country to hs traversed trihutary to their river trade.

It may be that upon reaching the Blue mountains a combination will he effected bet ween ths O. S. N. Company and Dr. Baker. This would insure the more rapid advancs of the road eastward, and bring it within easy reach of Boise City in a short time.

The project of huilding a railroad from Walla Walla to Seattle on Pugst souud, though long discussed and deferred, has been hy no means given up. It is bslieved hy many that a road connecting the Columbia basin directly with the Sound, would hs best for all interested.

The future of the North Pacific railroad, so far as the Pacific end is concerned, is at present involved in much doubt and uncertainty. It is said that the company intend huilding eastward from the mouth of Snake river this season; but it is not likely that they will do more, until compelled to, than to keep up appearances until they can get an extension of time for their chartsr; and even after that is secured they will only huild down ths Columhia as fast as ths conditions which may be imposed shall compel them.—*Idaho Statesman.*

James' Single-Track Railway.—Mr. D. B. James is constructing a car to run on the single-track railway in his hall, near the *Delta* office. The car is eight feet long—one-third the length of a full sized ons of this kind. This car is a good deal largsr thau the one he mads two or three years ago, and is large euough to prove that it can he successfully worked when put in actual use. It is not quite completed, but will hold seven or eight psrsons standing up, and runs from one side of the hall to the other with the greatest of ease. Mr. James has spent a number of years in perfecting his invention, and has succeeded in overcomiug all obstacles that presented themsslves, and there is not the least doubt that his single-track railway will work well in places for which it is adapted. The front wheel is so regulated that the car will make a curve as easily as a wagon, and the hanging platform on which the passengers are placed will prevent the car from being too heavily loaded on one side. A good locomotive it is estimated can be built for $1,500, and one for a test for $400. This is tbe cheapest railroad yet invented, and we see no reason why it could not he made to operate successfully; and it is our opinion that sooner or later this road will he as common for short lines as the narrow gauge douhle-track road.—*Visalia Delta.* [Mr. James secured his patent through Dewey & Co., and his one-track system was illustrated and descrihed in the Press some months ago.]

Honors to an American Savant.—At the annual gcneral meeting of the Royal Astronomical Society, held on Friday, February 14th, the Prcsident, Lord Lindsay, formally announced the presentation of the gold medal of the Society to Prof. Asaph Hall, of Washington, D. C., "for his disoovery and observations of the satolbtes of Mars."

Arizona Catacombs.

The Phœnix *Herald* gives the following dscription of recsnt discoveries of Arizona catacombs hy an exploring party, which will be read with interest:

Ths discovery was made about one mils east of Mountain Springs station, in the southeastern part of the Territory. Ths cave was found to have an arched entrance, about three feet wids and four feet high. Two of the explorers took the lead with candles placed in a small board and this fastened to a long pole, which was carried so that ths light was cast far ahead of them, and danger from pits or other obstacles thus avoided.

After proceeding about 100 feet down an incline, they came to the two main branches of the cave. Taking the one to the right and leaving candles at various points by which to find their way back, there being innumerable chambers branching out in all directions, they continued their way through a chamber, the walls of which, though presenting the appearance of stalactic formation, wers black and dingy, which was accounted for by the finding of ashes and other indications of fire, evidsntly very old. Here, no doubt, was one of ths haunts and resting places of the Apaches. Bones of all kinds of animals lay scattered around, no less than 200 deer antlers being seen, and other evidences of life-destruction and feasting. Animals may have done the work, hut if so they must havs had great strength to carry their prey to such a distancs.

Into this cavern they gropsd their way for a distance of 500 feet and found no end. In some places the cave was so small thsy would havs to creep through, and then suddenly would find themselves in a large room, full of gloomy grandeur, still as death and as full of mystery. Their candles giving out at a point about 500 feet from the entrance, they returned to the light of day for refreshments and more candles.

Upon re-entering, they explored ths passage to the left. The entrancs to this branch is ahout three fest high, hut narrow aud irregular for 300 feet; but passing through the aperture, the party found themselves in a large chamber with a heautifully draped stalactits ceiling, fully 75 feet above the floor. Here was glittsring grandeur, with a thousand varied beautiss and fantastic figures. This point is ahout 150 feet lower thau the entrance. From this chamher the cave, or caves, bore upward. Thers were three distinct passages, one above the other, and the explorers taking the uppsr one, went on and up for a distance of ahout 5,000 fest, until, as they believed, thsy were approaching a top entrance, the purity of the air in this hall leading them to ths conclusion that there was an exit ahove. Here again their candles gave out and they were compelled to return, only to hehold more and varied wonders, caves leading in every direction. Here and there was a small hole in the wall, into which the curiosity-seckers would thrust their torches, only to bshold immense chambers and shafts without hottoms. Every now and then the ring of ths passageway from their feet warned them that the floor upon which they stood was the roof or covering of another subterranean cave or pitfall. For five hours thsy penetrated into the dark recesses of these wonderful passages, chambers and complsx catacombs, only to arrive at the conclusion that to explore the great natural wonders hefors them would take days and perhaps months.

A Word of Caution.

The reliahle mining journals of the country are beginning to find out that it is necessary to give the people of the East caution respecting the purchase of wild-cat or valueless mining propsrty in ths West. There is an awakening interest in the East in mining west of the Rocky mountains, and it is important that that interest should bs judiciously directed and encouraged. Hundreds of impecunious and unreliable adventurers havs visited the wealthy cities of the Eastern States, and sold, from time to tims, utterly worthless property. The people who have bought the same are themselves responsible to a great sxtent for the injury dons. They were not justified in investing their monsy without first examining ths property purchased. But while many bad claims bave heen put on the market, much valuable property has besn disposed of, and many people have gained wealth hy investing in mining.

The gold and silver mines west of the Missouri river yield over $100,000,000 annually, and profitable purchases can, with care, he made almost at any time, hut caution must hs exercised and the door closed against unprincipled adventurers. It is generally conceded that there never was a better time for engaging in legitimate mining on the Pacific coast, than the present, but discrimination in the properties offered for sale must he made. Because one mine pays dividends under a wise and judicious management, it does not follow that all mines will pay. Good mines will pay better than any other class of property. Colossal fortunes are often accumulated in a very few years by the mere luck of discovery.—*Silver Reef Miner.*

According to the statement of the Atchison, Topeka & Santa Fe Railroad Co., filed lately, tbat corporation owns 245.26 miles of railroad within the Colorado, of the average value of $3,500 per mile, or in all worth $858,410.

Comparative Rainfall.

(Written for the PRESS by JAMES BLAKE, M. D.)

The statistics we possess of the rainfall in different parts of the State for a number of years are valuable as showing one of the most important elements of climate in the location to which they refer. There is, however, one point of view from which the large mass of figures we have accumulated on the subject has not been investigated, but which I think is likely to lead to interesting generalizations in connection with scientific meteorology. I allude to the quantity of rain that falls at any one place in different seasons, as compared with the rainfall at other places during the same season. This relative rainfall varies very much in different seasons, as will be evident from the accompanying table, which shows the rainfall at five places for the last six seasons, the rainfall at San Francisco each season being taken as the unit. The stations selected for comparison are San Francisco, Colfax, and Emigrant Gap, on the western slope of the Sierra; the former 4,231 feet and the latter 5,270 feet above the sea; Truckee, on the eastern slope of the Sierra, at an elevation of 5,600 feet; Calistoga, and my residence in the Coast range; the former 400 feet and the latter 2,100 feet above the sea:

YEARS.	San Francisco.	Colfax.	Emigrant Gap.	Truckee.	Calistoga.	Blake's.
1872-73.....	18.02	1.60	2.04	1.21	.....	.....
1873-74.....	23.08	2.00	3.00	1.23	1.17	.....
1874-75.....	18.40	2.00	2.33	1.17	1.44	.....
1875-76.....	28.01	2.40	2.57	1.60	1.56	.....
1876-77.....	9.00	2.10	2.10	2.00	2.00	.....
1877-78.....	32.15	1.35	1.70	0.75	1.50	*2.40
Mean.....	1	1.04	3.44	1.35	1.65	.....

A simple inspection of the table shows how different is the relative quantity of rain that falls at the same place in different years. In the column for San Francisco I have put the quantity of rain for each season, and which serves as the unit of comparison. We see that whilst in the winter 1873-74 three times as much rain fell at Emigrant Gap as at San Francisco, last winter only 1.7 inches fell at Emigrant Gap to 1 inch at San Francisco. All the stations have a larger average rainfall than San Francisco, but the relative difference was the least in almost every instance during the excessive rainy season of 1877-78, and above the average difference in the season of 1876-77, when the rainfall was least. This was most marked at the station on the eastern slope of the Sierra. The average rainfall at Truckee, as compared with San Francisco, is as 1.35 to 1; but during our wettest season it was only as 0.75 to 1, whilst during the dry winter of the preceding year it was as 2 to 1. Should a more extended series of observations show that there is an inverse proportion in the rainfall on the two slopes of the Sierra, this in itself will be an interesting fact. I regret that I have not been able to bring the subject before the academy in a more complete shape. These few remarks have been made principally to point out one direction in which the data we possess on the rainfall can be utilized, and I trust that some person with more leisure than I can command, will work up the subject. In preparing this paper, and others which I hope to present to the academy, I have availed myself of the data collected by the railroad company, which have been obligingly placed at my disposal. They contain a great deal of most important matter for the elucidation of the meteorology of the State.

*I have shown the rainfall at my residence on the St. Helena mountain for 1877-78 (the only year available) as an example of the large quantity of rain that falls there, and that, too, in a season in which almost every other locality shows the least relative fall. Twice as much rain fell there as at Colfax, a station on the Sierra, 300 feet higher.

A Leadville Romance.

The Deer Lodge shaft, owned by three Leadville men, had been sunk 130 feet, and on Friday afternoon the miners were working in porphyry and iron, and the indications were good. A party of capitalists visited the shaft about noon, and considered a proposition by the owners to buy a half interest for $6,000. They were to deposit the money at the Leadville Bank before five o'clock that afternoon or lose the bargain. A few minutes after five o'clock one of the owners of the mine calmly entered the bank and asked if the money had been deposited. He received an answer in the negative, whereupon he threw his hat up in the air and executed a breakdown before the astonished gaze of the bank people. Being asked the reason for his strange antics, he paused in his contortions, and said:

"Waal, gentlemen, I kinder think them air fellers got left this yar time. A half of the Deer Lodge, just at this precise minit, is worth $60,000."

It appeare that about four o'clock the men down in the mine struck mineral. Specimens were hurriedly sent up the shaft to the owners, who quietly went down town and caused them to be assayed, the result showing silver worth $400 a ton. The only fear then was that their offer of $6,000 for half the mine would be accepted. But the capitalists overreached themselves that time, sure enough.—*Leadville Cor. Chicago Tribune.*

Useful Information.

A NEW TEST FOR FLOUR.—A correspondent of the *Northwestern Miller* says: "In regard to the best method of testing flour for strength and color, I beg to say that for the past 30 years I have adopted the practical method of boiling dumplings for this purpose as follows: I am provided with a small pair of scales, and I weigh off three ounces (which is about two tablespoonfuls) of the flour I desire to test. I place it in a small basin, and add the necessary quantity of water to make it into a dough, which tie up in a cloth, and boil for about 20 minutes. The dumpling, on the removal of the cloth, if the flour is strong and good, should present a smooth appearance, and the creases produced by the cloth should be clear and well defined; if, on the contrary, the dough hangs to the cloth, and the creases are flat and ill defined, the flour is weak, and its baking properties bad. On cutting the dumpling, if the color is good it will not darken on cooling; but flour of bad color, on the contrary, becomes darker as it cools. I use a graduated glass to measure the water. The quantity of water used to make the dough of the usual consistency varies considerably, and is also a guide to the strength of the flour, as the stronger the flour the more water it will take."

WATERPROOFING FOR LEATHER.—A good article may be made by using paraffine melted with the requisite quantity of drying oil, and casting it into suitable blocks for subsequent use. This being softened by heat, the leather of the manufactured articles, as shoes and harness, is coated with it, and placed near a fire or in a warm place, until the composition has been absorbed. When leather has been impregnated with the mixture it is not only perfectly waterproof, but it is also rendered softer and more durable. Shoes retain all their firmness and natural elasticity, and blacking makes upon them a better polish than before. This same composition is also useful for waterproofing woven goods. It is placed on the under side of cloth for garments, either by melting and applying moderately with a brush, or by rubbing with a block of the preparation. The complete diffusion of it through the texture is effected by passing the cloth between hot rollers. Fabrics prepared in this manner, while they repel water, are perfectly pervious to air. For this reason they are superior to ordinary oil-cloth and rubber goods. They also look better than garments made of rubber, as the finished appearance of the cloth is in no way changed by the treatment.

ARTIFICIAL SILVER.—A correspondent of the Burlington *Hawkeye* tells a sensational story of an alleged discovery of the artificial manufacture of silver, by Dr. T. Farriss, Jr., of the Iowa Wesleyan University, which carries one back to the days of the old alchemists. Dr. Farriss, it seems, when taking his class through a course of instruction in the primary chemical compounds, was in the habit of setting aside the refuse waters, and one day was startled by the unusual silvery reaction which had taken place in these solutions. This led him to investigate. Result—the artificial manufacture of silver, a business on which the Doctor is said to have entered now on a large scale. Of course, details of the new process are kept rigedly secret from the scientific world, though credulous capitalists may be attracted by the glittering prospect just as they have been in the past by Keeley motors, Paraff's gold process and other impossibilities.

A GOOD GLASS CEMENT.—Mix 10½ pounds of pulverized stone and glass with 4½ pounds of sulphur. Subject the mixture to such a moderate degree of heat that the sulphur melts. Stir until the whole becomes homogeneous, and then run it into molds. When required for use it is to be heated to 248°, at which temperature it melts, and may be employed in the usual manner. It resists the action of acids, never changes in the air, and is not affected in boiling water. At 230° it is as hard as stone.

PAINT AND PAPER FOR HOUSES.—In the first place, all the painted wood-work should be varnished; in this way the deleterious ingredients of the paint are rendered harmless, and the cleaning is much more easily accomplished. In regard to paper, it may be said that all rough papers should be avoided, because they collect, absorb and retain too much dust. All papers containing arsenic or Paris green in their coloring should be avoided. The smoother the surface of the paper the better. Whenever rooms are to be repapered, all the old paper should be removed.

To "dry" linseed oil without boiling it, add to old oil about two per cent. of borate of manganese, and heat in water-bath to almost 225° F., stirring well. To accelerate the process of filtering, Ehermayer advises to put first in the funnel a piece of cotton cloth folded exactly as a filter, and then outside of the cloth to place the paper filter.

SOMETHING NEW IN JEWELRY.—Articles of jewelry have lately been made in Europe from dried ox-blood. Blood is strained, dried, powdered, sifted, and pressed in molds at a temperature of about 300° F., for from five to ten minutes. The casts are then taken out and polished.

THE artificial propagation of sponges having been demonstrated by Brehms and Buccich to be possible and easy of accomplishment in the Mediterranean, although, through the ignorant prejudice of the fishing population, their very instructive experiments have as yet yielded no practical results, the *Scientific American* suggests that it might prove a profitable venture for some of our enterprising citizens to undertake the propagation of fine sponges in American waters. The Florida Keys and the Gulf of Mexico are affirmed to be suited for this purpose.

HARNESS SOAP.—Take resin soap, 2 lbs.; sperm oil, ¾ lb. Digest the soap with a quantity of boiling water, just sufficient to soften it thoroughly, when it may be triturated with the warm oil and a sufficient quantity of fine bone-black until a uniform paste is obtained. Ordinary unmixed soap turns brown many of the black pigments in use. The addition of oil is a great improvement.

A NEW THING IN WALL PAPERS.—The *Chemiker-Zeitung* states that wall-papers, in imitation of silk, are now manufactured at Aschaffenburg, dyed in the mass, and afterwards printed by means of the cylinder machine. The paper is made of cellulose. It has a decidedly silky appearance and feel, and the effect is pronounced pleasing. The designs are always executed in darker shades of the ground color.

To remove grease spots from hemp carpets, use a solution of borax, one pound to one gallon of warm water. Heat rancid oil with a little calcined magnesia, and it will be restored to its original purity.

Good Health.

Disease Germs in Diphtheria.

The recent application of the microscope to medical inquiries has developed the important fact that many diseases are occasioned by malign attacks upon the vital domain by germs of various kinds. It is well known that typhoid fever, yellow fever, malarial fevers, and most other febrile diseases, are occasioned by the introduction of germs into the system; but it has not, in many cases, been the good fortune of physicians to discover the exact character of these microscopic enemies of human life. In the case of diphtheria, many most eminent physicians and scientists are satisfied that the mischievous germ has been discovered, after a long and pains-taking search.

The germ causes of diphtheria are very minute organisms, being too small to be seen except by the aid of a very good microscope. They are so small that a row of them an inch long would contain from 10,000 to 20,000. Singly they are too insignificant to deserve attention, except as microscopical curiosities; but when massed together in the countless numbers in which they infest the mucous membrane in this disease, they acquire an importance which is often terribly great to the victim of their ravages. There are two varieties of these parasites, known respectively as *micrococcus* and *bacterium termo;* the names are certainly no more formidable than the creatures themselves, small though they are. The two organisms are always associated, and can be very easily studied with the aid of a good microscope, by anyone at all familiar with the use of the instrument, by examination of the false membrane, freshly taken from a patient.

We have just taken a small piece of diphtheritic membrane from the throat of a patient suffering with the disease, and placing it under the microscope, with a little mucous from the same source, the germs referred to are distinctly visible in great number, all actively swimming about, making the whole microscopic field alive with motion. Just so they existed in the throat of the patient a few moments ago, vigorously at work insinuating themselves into the mucous membrane, prying their way in between the cells, even getting into their interior and depriving them of the power to perform their functions, clogging the bloodvessels, causing irritation of the membrane, and, as a consequence, the pouring out of fibrous matter which forms false membrane.—*J. H. Kellogg, M. D.*

SOCIETY AND SOLITUDE.—A correspondent writes that she thinks her health would be much better if she did not get so lonesome, and asks if lonesomeness is not the cause of a morbid condition bordering on disease? To which we answer, that man by nature seeks society and also solitude. A harmonious change from one to the other is essential to the best health. Where there is too much solitude there is apt to be despondency. Where one has too much society he is apt to wear out prematurely. It is not easy to arrange life so as to have just enough of each. If every hour brings a swarm of company the result upon the moral nature is unfavorable. If, on the other hand, man is too much isolated from his fellow men his social nature suffers, and the mental faculties are not properly developed. Lonesome people who live in the country should make friends of nature; animals, plants, trees. These become to them, in a certain sense, society. A horse and dog make very good friends indeed, and rarely give offense.—*Herald of Health.*

GLOOMY THOUGHTS AND GLOOMY WEATHER.—Dull, depressing, dingy days produce dispiriting reflections and gloomy thoughts, and small wonder when we remember that the mind is not only a motive, but a receptive organ, and that all the impressions it receives from without reach it through the media of senses which are directly dependent on the conditions of light and atmosphere for their action, and therefore immediately influenced by the surrounding conditions. It is a common sense inference that if the impressions from without reach the mind through imperfectly acting organs of sense, and those impressions themselves are set in a minor æsthetic key of color, sound and general qualities, the mind must be what is called "moody." It is not the habit of even sensible people to make sufficient allowance for this *rationale* of dullness and subjective weakness. Some persons are more dependent on external circumstances and conditions for their energy—or the stimulus that converts potential into kinetic force—than others; but all feel the influence of the world without, and to this influence the sick and the weak are especially responsive. Hence the varying temperaments of mind changing with the weather, the outlook and the wind.—*Lancet.*

LET CHILDREN HAVE PLENTY OF SLEEP.—As sleep is the period for replenishing the system, for restoring the cells wasted by the nervous activity of the day—the period when the processes of digestion reach their final result, by identifying the new nutriment with the system in the place of the waste of the tissues—it follows that children need more sleep than grown persons. Many who might be plump, active and happy, if given sleep sufficient, are flaccid and sallow, weary and fretful, because they do not sleep enough to allow the demand of the system for nutrition to be supplied. Children often feel it very hard that they are sent to bed early, while the grown people sit up and enjoy themselves long after they are in bed. If any children chance to read this paragraph, to them we would say: You need more sleep than your parents, because you have to grow and they do not. You need to use a good deal of the food you eat in growing larger and stronger; if you consume it all in activity, you will not have enough to grow with. Therefore you ought to sleep a great deal, and let the body rest, if you would grow strong and healthy.

THE WILLOW AS A PREVENTIVE OF MALARIA. Mr. Von Lennep, Swedish consul, writes from "Mahazik, near Smyrna," to the London *Times* as follows: "Before the encalyptus was ever heard of in Asia Minor, I had seen the bark of the willow used as a febrifuge. I had remarked the easy and inexpensive reproduction of this tree, its quick growth in damp places, its excellent qualities for fuel and for agricultural implements, and its great advantage for strengthening the banks of capricious streams, and had thence taken every opportunity after the winter floods to stick willow cuttings along the banks of streams and other damp places in my property; also to scatter the plane-tree seeds in marshy spots. The result has been that, whereas 20 years ago the full grown trees in this neighborhood might have been counted, a luxurious growth of willows and plane-trees marks my place, fuel is abundant, fever is steadily decreasing, the meandering propensities of the streams are checked, my neighbors have come to me for agricultural implements, and I have not far to go for timber for rough purposes.

MEDICINAL EFFECTS OF ONIONS.—A mother writes to an English agricultural journal as follows: "Twice a week—and it was generally when we had cold meat minced—I gave the children a dinner which was hailed with delight and looked forward to. This was a dish of boiled onions. The little ones knew not that they were taking the best medicine for expelling what most children suffer from—worms. Mine were kept free by this remedy alone. It was a medical man who taught me to eat boiled onions as a specific for cold in the chest. He did not know at the time, till I told him, that they were good for anything else." The editor of the journal adds: "A case is now under our own observation in which a rheumatic patient, an extreme sufferer, finds great relief from eating onions freely, either cooked or raw." Dr. G. W. Balfour, in the Edinburg *Medical Journal*, records three cases in which much benefit was afforded patients by the eating of raw onions in large quantities. They acted as a diuretic in each instance.

A RESPIRATORY VAIL.—As a rule vails covering the nose prevent full respirations, but they are at times useful, as when one is exposed to dust, as in riding upon dusty roads, either by rail or carriage. In such cases a properly constructed vail keeps the dust from entering the breathing organs. The best method of making one is as follows: Take an ordinary piece of blonde 12 inches wide, over the lower four inches sew a double thickness of gossamer silk. Two layers are sewn to the piece without difficulty. Ladies may attach them to the lower part of an ordinary vail, and thus the objection made to the appearance of ordinary respirators, so much used in England, is avoided.—*Herald of Health.*

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Mining and Locomotive Head-Light, Emile Boesch, S. F.
Asbeetos Wanted, Wm. Oliver, 323 Mongomery st, S. F.
Wanted—100,000 Tone of Steel Rails.

The Week.

The week has been characterized by nothing of special importance among mining interests. Ths abundance of water this season admits of the working of both placer and quartz mines to tbsir fullest capacities. That the time has not been wasted in their development is evidenced hy the number and size of the late bullion shipments. It is estimated that during the past week the various gravel mines of Nevada county alone bave clearsd up from $100,000 to $125,000. Othsr counties speak up quite as favorably, and in all the general indications seem to grow more and more favorable with each day's work.

The workings on the Comstocks are fast approaching the points where the new bonanzas are promised and expected, and Ophir is reported to have been already fortunate in the discovery of a rich new ore body. At Sutro, 200 men have heen knocked off from the tunnel force, for the reason that there were not cars enough to run out all the dirt made hy the gangs. The shares of the Bulwer mine have been increased from 50,000 to 100,000, and the stock will he entered on the New York boards. We note also that the mines in Washington Territory and neighhorhood are awakening some interest, hut their development is greatly retarded hy inaccessibility and the rigor of the climate. Reports are still received of large prospects and attainments at Leadville, and immense crowds are heing drawn together from all parts of the oouutry, and yet, in the face of these reports, Colorado papers are cautioning people against flocking in, and stating facts to prove that nothing hut hardship and disappointment can result to the mass of the treasurs seekers. Large numhers are reported to he leaving Leadville and returning to the Black Hills and elsewhere, failing to find smploymsnt in the new camp.

Investing in Dividend-Paying Mines.

We are advised by the Eastern mining press that whils the shares of sonnd, dividend-paying mines find ready market in that quarter, worthless properties and mere prospects meet with no favor, nor are thsy ever likely to do so. Eastern adventurers have heretofore suffered so much through worthless and deceptive purchases, that they havs resolved to act with extreme caution in ths future. This we are glad to learn, snd hope they will stesdfastly adhere to this wise policy hereafter. It is a good thing for parties about to purchase mining shares to secure only those of dividend-paying properties; and let it only be known that there is a demand for snch in the East, and, we answer for it, there will be no lack of supply. We greatly mistake the capacities of our mine manipulators if they shall not be able to meet all requirements of this kind, furnishing dividend-paying mines of any pattern and to any extent. Let the people of the East or any other part of the world try the experiment, and if the managers of our mines fail to fill all orders, then we have greatly underrated their resources in an exigency of this kind. To fill a lsrge invoice would, of course, take some time; hut it can be done. If the ore required for making ths necessary amount of bullion is not just in sight, it can with a little extra effort he gouged out and hurried through the mill, a little extra milling capacity being meantime engaged to expedite the husiness; or if the ore is not in the mine, it can, of course, he obtained in the neighborhood, and if not, why then the shareholders can be assessed to pay the dividends. It is by no means so hard a matter to get a mine on to a dividend-paying basis as some people suppose. But to maintain it on such basis becomes often a troublesome business. Our mines have a had habit, after having heen brought into a dividend-paying condition, of suspending these dividends and substituting assessments in their stead. This has happened one time or another with nine-tenths of this class of mines in the country; wherefore, the Eastern investor, when he buys the shares of a dividend-paying property, can have no guarantee that it will long continue such. He may fondly believe, as he did when a year or two since he bought the bonanza stocks, that the disbursement of dividends will be, for a long series of years, as snre as the payment of interest on United States bonds, only to find in the course of a few months that he has heen grossly mistaken.

We will not expose ourselves to the charge of being invidious by pointing out with more particularity the instances in which people, hoth here and elsewhere, have been grievously disappointed through investments made in mines that it was supposed would prove to be permanently dividend-paying properties. It is enough to say that these instances have been sufficiently numerous to prove the very treacherous character of these investments, and to admonish our Eastern friends that they have a care how they buy the shares of even our dividend-paying mines.

As it was only last week that we took it upon us to suggest the need of caution in the purchase of mining properties on this coast, it may be asked what then are Eastern investors to do if both the stocks and the mines themselves are such dangerous things to meddle with. To this it may be replied, that if parties abroad desire to become interested in our mines they had better go about the business as is the practice with us on this side; that is, buy up partially or fully developed claims already located, equipping them themselves or else buy mines opened, outfitted and actively productive, being careful not to pay more in any instance than a fair equivalent for what they get. Or they might, as is the custom in all mining countries, provision and send out experienced prospectors to hunt for and take up mineral deposits on joint account, a very good plan where there remains, as on this coast, so much territory but partially explored. The mining field in this region of the extreme West is very extensive; its forms of wealth are varied, and it is, comparatively speaking, but little occupied, offering every inducement for parties to enter and search after metalliferous deposits for themselves. As an encouragement to this course it may he stated that more valuahle mineral developments, productive mines and promising prospects included, have been made in Mono county, California, within the past two years than have within a like period ever before heen made in any county in this State; and yet Mono was overrun with prospectors as much as 16 or 18 years ago and afterwards almost totally ahandoned, simply because the first crop of prospectors lacked the pluck, or rather perhaps we should say the means, to open up the gold-hearing lodes that so abound here, to even the most inconsiderable depths. California, the most thoroughly explored and extensively worked of all our Pacific coast possessions, after a thirty years' mining experience, remains to energetic enterprise hacked by ample pecuniary means an almost virgin field, the whole State from San Diego to Siskiyou being full of undeveloped and undiscovered mines of gold and silver. In scarifying the surfacc here and there we have scratched out the more superficial deposits of gold dust, hut have as yet done hardly anything towards developing the deep-lying placers or the metalliferous veins, the sources of a much larger and more permsnent wealth.

We know well how badly, in many instances, capitsl has fared, even in California. But we ars of the opinion, for ressons not long since set forth, that investors in our mines will be more fortunate hereafter thsn they havs been. There has not heen much money lost in mining of late, the fortunes of this class of investors having taken a turn here several years ago; and we incline to the belief that the era of profit that has so set in will extend into the indefinite future—satisfactory gains being the rule, and not, as heretofore, the exception. At all events we are impressed with the idea that money embarked in practical mining will be ssfer and more likely to earn something continuously, than if invested in the shares of even dividend-paying properties. If only there was any certainty that these disbursements could he kept up steadily and permanently, then, to be sure, would these securities prove a very enticing sort of investment, as they are apt to bs liberal enough while they last. But the trouble is they do not last long, as ths history of this class of properties on the Pacific coast tends to show. Of all the mines whose shares are now called at the San Francisco and the New York stock exchangss, scarcely a dozen are yielding a net revenus. Two years ago, when the bonsnza mines were paying dividends, and were gensrally esteemed a desirable investment, tbs principal owners of these sbares were buying largely United States four per cent. bonds, and subsequent events have approved their financial acumen. Only one year since Bodie shares were largely bought up at extravagsnt figures, ths public being assured that there was ore enough in sight to make dividends certain for a long time to come, and yet some months have elapsed sincs Bodie passed over to ths list of profitless mines.

The number of these dead properties, so once of good repute and excellent promise, is, indeed, so great that one is almost forced to conclude that they were only by a spasmodic effort rushed into a seeming and short-lived prosperity that their worthless shares might be unloaded upon the public, and we counsel our Eastern friends to beware, lest, while they are congratulating themselves on their shrewdness in buying only the shares of divident-paying mines, they be preparing for themselves a bitter disappointment.

Stock manipulators on this coast are not more unscrupulous than stock operators elsewhere, but they are not the philanthropists to offer mining shares or anything else at much less than what they believe to bs their real value simply for the good it will do others. If they offer these shares on the Eastern market, it is because they expect to get the full worth of them. But, as this whole business is merely a species of gamhling, intelligent people everywhere ought to know something of the chances they take when they engage in it. If, depending on long practice or their natural astuteness, they think they can "beat the game," it may, perhaps, be as well for them to continue "bucking" against it till that point is determined in the affirmative or otherwise. We have no advice to give those engaged in, or who purpose to engage in, stock dealings. This is a mining journal, not the organ or adviser of speculators in mining shares. Our work lies in another direction. We have to do with the practical branches of the business. It is ours to counsel and advise with those who toil and invest in the fields of this mighty industry, and for them ws have words of good cheer. The best days of mining are before them. Its great successes remain to be achieved. What has been done will he as nothing compared with what we shall soon accomplish. We are apt to think that '49 was the epoch of great things, but a hundred men shall shortly produce more bullion than ten thousand did in the early days. This industry is embryotic; it has not yet reached its infantile state. The new men, who are now coming here from the Eastern States and from Europe to engage in practical mining, will yet be accounted almost as mnch pioneers as those who came thirty years ago.

That those in the East, who have studied this matter closely, take the above view of it is evident from the number who are now coming to this coast with the intention of spending here enough time to acquaint themselves thoroughly with our mineral resources through a personal inspection of the same. In times past, the most of those who have visited us on errands of this kind have been only speculators, agents or middlemen. But now, principals, capitalists and thorough-going business men begin to make their appearance, having concluded to come and see for themselves. If now these parties will proceed with this business leisurely, availing themselves of the services of competent experts, being careful to select such as have had large practical experience, they can hardly fail to find, in almost any of our mining counties, properties in which it will do to invest their money, and that can be obtained on terms that will leave no reasonahle grounds for complaint. There are in this State vein mines, as well as hydraulic and drift diggings, that strongly invite examination. Then, too, we have sea heaches to he worked, modern river beds to he dredged and deep hasins to be cleaned out, to say nothing of the vast accumulations of rich tailings that call for re-washing. The mineral wealth of other countries is apt to be confined to one, or two forms at most. But here in California it takes on many shapes; our assortment, to adopt the language of commerce, being choice, varied and complets.

The Restless Blacks.

Since we commented last week upon the emigration movements among the negross of ths Southern Statcs, there have been received dispatches annouucing that the people are still in motion, and various objective points are being borne down upon. We notice tbat in a mseting favoring tbs emigration, held in New York city, one of the speakers encouraged ths idea that California bs made ths promised lsnd of ths new exodus. This orator clsimed that thousands of negroes could easily find employment "along the coast" in this State. What this throng could do unless they take to hunting "coast whales," it is difficult to imagine. It is true thst our coast counties are prosperous, and the chancs for steady employmsnt is as good, if not better, than elsewhsre in the State, but there is no reason to expect that a throng of dependent lahorers like ths negroes, who are douhtless, for the most part, wholly unacquainted with our various styles of work, could find the asylum they need. If adequate cspital and effective management were furnished it is possibls that soms parts of our Stats would bs found admirably adaptsd to cane and cotton growing. But these industries have not passed the expsrimental stage in this State. If the reduction of the labor force of the South should rsducs the cotton supply, there would bs an advance in price which might make our cotton ventures attractive, but this is problematical. As for csne growing on a large scals, it is a branch which it would take time to devslop even if climatic and pecuniary conditions should be favorable. It is plain to our minds that a lsrge influx of negroes would be unfortunate for the immigrants and a burden to the State. For the negro has grown under a system of lahor most unlike that which prevails in this State. He is wholly unaccustomed to shift for himself. The old regime of the plantation made him the object of the planter's especial care, and he is probably the most dependent laborer in the world. Here the case is exactly otherwise, and the laborer is thrown upon his own resources as soon as the heavy work of the season is done. Even if a number of the negroes could find work during harvest, it would be work to which they are wholly unaccustomed and their earnings would be small. When harvest is over they would go to swell the burden of improvident and dependent men, of which the State has already a surfeit. It is possible that if a number of ths men should reach this coast they would be forwarded to the cane fields of Hawaii where they are needed, but the movement would be a hazardous one unless arrangements were made beforehand with the capitalists who are carrying on the Hawaiian enterprises.

Our State would welcome a larger population it is true, but it should be composed of men fitted by disposition, skill and money to undertake moderate ventures of their own. There is no reason why the unskilled, the dependent, and the empty-handed should make this State tbe goal of their wanderings.

The Western Shore Ice Company.

We visited this week the works of the Western Shore Ics Company, at 821 Battery street, and saw the machinery for the manufacture of ice, which we illustrated and described a short time since. Ths ice mads is very clear and solid, and does not have the snowy appearance common to most manufactured ice. The machinery which they have in operation is capable of making a ton and a quarter of ice per day, and is kept running simply to show the process. They have made two other one-ton machines and a five-ton machine.

In places where power is already in use and available, ice can he made at a less cost than where a separate engine is used. The apparatus is very simple in its operation and not likely to get out of order. It requires only the attention of one man. By the peculiar system of agitation of the water during the process of freezing the resultant ice is clear and hard, and contains no air, as artificial ice usually does. It will therefore keep much longer.

A one-ton machine will make ice for a quartsr of a cent per pound; while a 20-ton machine will make it at a cost of one-twentieth of a cent. The apparatus will cool air also, and is very useful for brewers, pork packers, etc. The company are prepared to manufacture machines of various sizes for use in interior towns, where ice cau he made and sold as a business. Several of them have already heen put to use for this purpose. They are made under the H. J. West patent, which is in extensive use in Europe, where all the large hreweriss have adopted the system. Among other uses for which the machinery is invaluahle, are preserving meat, fish, vegetables, fruits, etc.; cooling mines, theaters, dairies, and for all purposes where a low temperature is desired. The company sell the machines with a guarantee to do csrtain work.

THERE are 15 logging camps in active operation within hailing distance of Olympia, W. T., and many others are preparing to start up.

A New Alden Fruit Drier.

We give helow a cut and description of heater, hoisting apparatus and system of ventilation, recently patented for the Alden Fruit Preserving Co., through Dewey & Co's. agency, which seems to present some decided improvements on the old Alden invention, both in machinery and process, and we commend the same to the candid consideration of our readers. The Alden Company has certainly done much to advertise the business of fruit growing and drying, and since the first factory was started in this State, thousands of acres have been planted to the finer sorts of fruit, with special reference to drying them. There are now some 40 Alden evaporators in this State, and probably an equal number in Oregon, and the demand for Alden goods is constantly increasing. The merchants who sell them report that the price of Alden products is about 50% higher than fruits dried by other machines, and more than 200% higher than sun-dried fruits. Alden apples are quoted at 10 to 13 cents per lb; apples dried by other machines at 5 to 7 cents, and sun-dried apples at 2 to 4 cents, and other fruits in proportion. These figures should have great weight with fruit growers, as it is but another demonstration that it is useless and wasteful to place on the market common or inferior fruits, either green or dried. The Alden products may be no better than those dried by some of the other machines, but they secured for themselves a distinctive recognition and remunerative prices in the world's markets, and owners of Alden driers will do all they can to preserve this valuable prestige.

We learn that the "Improved Alden Evaporator" has been in use during the past season in this State, Utah and other places, and has given perfect satisfaction, and that it is about to be introduced in Oregon. The greatest objection to the old Alden is the high price for the machinery and royalty, and as the royalty has been abolished and the prices of the apparatus so greatly reduced, under the new *regime*, placing the improved evaporators within the means of our fruit growers, we may look for an increased interest in this important and growing industry.

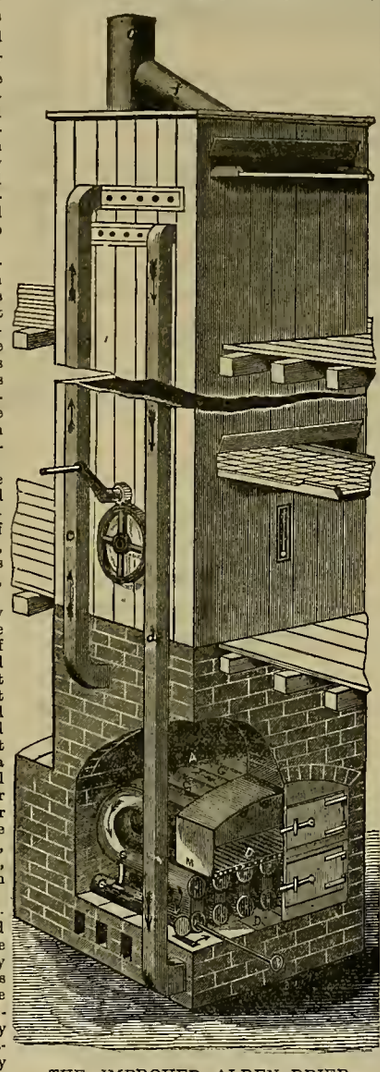
During the five years of practice which the managers of the Alden fruit company have had in this State, they have discovered room for improvement, and they now offer the result of their experiments in the shape of an evaporator, for which they claim superiority over all others in simplicity of construction and operation, durability, capacity and cheapness.

It will be noticed by the engraving that they retain the Alden process, *i. e.*, "moving the fruit, in a vertical chamber, in currents of heated and humid air;" but they have added important improvements, by which they not only generate the heat at less cost of fuel, but also apply it in a more effective manner and secure a more *rapid* current of air through and over the fruit-loaded frames. All know that the most essential thing in fruit drying is a rapid current of air. Water evaporates at all temperatures when in contact with air, or other gases. The higher the temperature the greater will be the evaporation. But if the air be heated and at rest, fruit will not dry. Wind, air in motion, is necessary to dry any substance, and more is due to the wind than to the sun, in drying the earth after a shower.

So soon as fruit is heated to a proper temperature, the affinity between the solids and liquids is broken, and if the application of the heated air is not such as immediately to carry away the watery vapor, it at once commences to consume the vital and sugary part of the fruit, by the process of fermentation, which destroys the color and the flavor of the fruit, by converting the saccharine element into caramel—burnt sugar—as in sun-drying or in any other slow method of evaporation. By the improved Alden method the saccharine matter is developed by a rapid ripening process into glucose or grape sugar; the fruit is preserved in its own concentrated juices and will keep for years in any climate; and as every particle of the fruit is subjected to precisely the same conditions of *heat*, *humidity* and *time*, the products have a uniformity of appearance and excellence of quality not attainable in any contrivance in which the frames remain stationary; so the grand secret of success in fruit drying consists in moving the fruit in a *rapid current of air* through the evaporating chamber. To secure such a rapid current of air a variety of methods have been employed, but all have failed to produce satisfactory results, except suction fans or blowers; but as such blowers add largely to the cost and operating expenses, they can never be used economically except in very large establishments.

The improved Alden patent covers improvements in air-heating furnaces, hoisting apparatus, and a novel arrangement or system of heat-distributing and ventilating flues, of which the following is a brief description, references being had to the accompanying cut: *A* is the heater, and is composed essentially of the fire-box, *D*; ash box, *D'*; and double return horizontal pipes, *G*. There are six such pipes, four inches in diameter, running parallel with each other, and the products of combustion pass through them, as shown by the arrows, and are discharged into the smoke-stack, *O*, at the back of the heater. The fire-box is surrounded by an air space, with openings, at *M*. Similar cold air openings are provided on the sides, near the bottom of the enclosing walls. The cold air comes first in contact with the lower and moderately heated pipes; then rising successively to the second and third tiers (the upper tier being the hottest), it is heated by degrees, and as the pipes are placed close together, the air is *filtered* through the narrow spaces between them, thus bringing every atom of the air into close contact with the heated pipes, which, all will admit, is a much more effective method of heating air than by radiation. Air will not heat air, and is only heated by actual contact, or by admixture of its atoms.

It will be noticed that the new furnace has an immense heating surface, and that the pipes can be easily cleaned of soot. The entire structure is made of cast iron, with very few joints, which are made perfectly tight. If the pipes are kept clean, the heat will pass readily through their walls, and as the air, coming in contact with their exterior surfaces, will carry the heat rapidly away, the pipes and fire-box will not be subjected to any destructive heat, which secures the three important considerations in a heater: First, utilization of large percentage of heat;



THE IMPROVED ALDEN DRIER.

second, atmosphere unimpaired by overheat; and third, a durable pot.

This furnace, with the flue, *d*, affords, also, a most effective and economical method of heating and ventilating houses. The furnace is placed in the basement with the usual arrangement of hot-air pipes. The fire-box is connected with the apartments above the basement by means of the flue, *d*, and in this way, perfect and cheap ventilation is secured.

In the old style of heaters, with domes and vertical pipes (which cannot be cleaned) only a very small portion of the cold air admitted into the area enclosed by the brick walls, comes in contact with the heated plates, and a large fire is required to produce the proper temperature of the air after admixture of its atoms. Such a high heat is very destructive to the furnace and impairs the vitalizing qualities of the air. Besides, the old style of heater has no convenience for cleaning the pipes and dome, and all know that the accumulation of soot and dust acts as a perfect non-conductor, so that only a very small percentage of the theoretical heat-value of the fuel is utilized—the bulk escapes through the smoke pipe and is lost.

There are several serious objections to the Alden hoisting machinery, aside from its great cost. The breaking of the lugs, or the slipping of the endless chains (which happens often), cause loss and great annoyance, and the wheels and worm screws wear out in a short time. Besides, the chains leave air spaces on the sides of the chamber, through which considerable heat escapes and is lost. The new apparatus is simple, strong and cheap, and will last for years. It is located on the first floor (the old Alden is on the top), which is a decided advantage in operating, and allows a great saving of labor and material in constructing the evaporator. The fruit frames are square and fit closely the sides of the evaporating chamber, which is, say, two inches larger from front to back than from side to side. The first fruit frame is pushed in to the *back* wall of the chamber, and is then raised about five inches by simply turning the crank; the pawls catch and hold it while the rack is turned down to its original place. The next frame is then pushed in so as to rest against the front wall of the chamber, when the operation is repeated. By this method a space of, say, two inches is left between the front and back walls of the chamber and the ends of the frames, thus giving to the heated air a zigzag course over the fruit-loaded frames in its ascent through the chamber.

The object of the heat distributing flue, *C*, is to convey hot air from immediately above the furnace, to be admitted into the chamber at one or more places between the feed and discharge doors, through openings in the wall of said chamber, which openings are provided with regulating registers. The hot air, so admitted, will force up and carry off any moisture which might otherwise condense and fall back on the fruit in the upper part of the chamber. The original Alden has no such heat-distributing flues, and the result is that the fruit often arrives at the discharge door in a wet and clammy condition and unfit for packing without further drying.

The most valuable feature of the new invention is the flue, *d*, which connects the top of the chamber with the fire-box of the furnace. When we state that it has been ascertained that the amount of air required for combustion, in one of the furnaces herein described, is about 25,000 cubic feet per hour, all of which is taken from near the top of the chamber (which chamber is closed against the external air) through the flue, *d*, the great importance of this system of ventilation will be appreciated and need no further argument. The removal of such a vast volume of air produces a partial vacuum at the top, and, as a consequence, causes a very *rapid current* of hot air through and over the fruit frames in the chamber, a condition absolutely essential, as before stated, to the attainment of highest perfection in the art of fruit preservation by pneumatic evaporation. It will be noticed, too, that the air, so supplied to the combustion chamber, is already heated, which effects a saving of fuel.

Worthington's Improved Windmill.

The top of the evaporating chamber is connected with the smoke-pipe by the flue, *f*, through which is carried off considerable air by the force of draft or suction in the smoke-pipe.

The thermometer is set into the wall with the bulb *inside* and the scale outside, as shown, so as to ascertain the temperature in the chamber without opening the feed door, as is done in the old Alden, admitting a large volume of cold air, which is very objectionable. The improved Alden evaporator has been in actual use during the past season, and we are told it has given perfect satisfaction. We are also informed that being conscious that business is dull and money scarce, the Alden company offer their new evaporator at prices in accord with the times. They furnish to each purchaser plans and directions for the erection and operation of the evaporator. Almost any ordinary two-story building (the old Alden requires a three-story building) can be cheaply altered into a serviceable factory for the large evaporators, while any room or shed about the premises will answer for the family size. No skilled labor or high salaried superintendent will be necessary to erect or operate the new evaporators. They have been sent to Australia, Utah and other distant places, and no complaint has been made.

The company are doing a good public work in giving detailed directions for preparing fruits, vegetables, hops, beef, etc., before placing the same in the evaporators, and for packing and marketing the products. We can only say here, in a general way, that it is very important that all articles, especially fruits with white meat, such as apples, pears, etc., should be placed in the evaporator as soon as possible, after being pared, *to prevent oxidation*. Cut articles, allowed to accumulate and to be exposed to the atmosphere, will soon lose their color, which no art can restore. To prevent such discoloration —browning—it is only necessary to exclude the *air* and *light*, and the simplest process is to drop such articles, as soon as sliced, into a vessel of fresh water impregnated with a small quantity of any acid—tartaric acid is cheap and quite harmless. Or, the articles may be subjected, for a few moments, to the vapors of sulphur, coke, or any other substance possessing similar bleaching properties. These methods are much cheaper and more convenient than the secret "bleaching" and "antiseptic processes," brought before the public, many of which are objectionable, because it is claimed "they diminish the nutritious quality and impair the taste of the fruit and injure the teeth and the digestive organs."

The new Alden evaporator is furnished in three sizes, of capacities ranging from 40 to 300 bushels of apples per day, and other fruits and vegetables in proportion, at prices about 400% below those heretofore charged for Alden machines. The former price of an Alden machine of capacity of 100 bushels per day was $1,500, including royalty; the present price of one of the new machines of same capacity is $400, including royalty. To show, still further, the great reduction in cost of machinery and building, the company refer to the first Alden factory started in California, which had five machines and cost $15,000. Now they are ready to contract to erect a factory of larger capacity for $3,500, including royalty, and furnish everything (except the land) complete and ready for operation. The building they promise shall be substantial and of sufficient dimensions for a factory of such capacity. The fruit frames shall have galvanized wire cloth, and the heater and all the apparatus shall be well made end of the best material. The products will be superior, under proper management, and as they may be placed on the market under the Alden brand, they will have the benefit of the prestige enjoyed by the Alden goods, to which we have alluded, and may also meet the demand for army and navy contracts which are now restricted to this class of dried fruit. The new Alden machines are being introduced to the public by the Alden Fruit Company, room 20, No. 328 Montgomery street, S. F.

A New Windmill.

In the making of windmills as of books there is no end; and so long as the inventors and manufacturers bring out good points and lessen the cost of their machines, the public interest is served. It is our practice to give notes and engravings of these new devices, in order that all our readers may know what is in the wind.

The windmill shown in the engraving on this page, is called "Worthington's Improved." The improvement has been patented by Warren D. Parson, who was the inventor of the celebrated "Colorado wind engine," which is widely known. In the Worthington improved mill it is claimed that simplicity and cheapness have been combined, with sound principles and practical working qualities.

The inventor claims especial merit for the regulating features of the mill. An ingenious device, in the form of a regulating weight, causes the wheel to be extremely sensitive to start out of the wind. As it goes out of the wind the weight is compounded, offering greater resistance the farther out it goes. Thus the disposition which this class of mills have to stay in the wind too long, and to go out too far when they do start, is counteracted.

The motion to the pump-rod is communicated from a common crank in such a manner that the pump-rod moves straight up and down through the turn table, which is small and has but little friction. The wheel is balanced well on the tower by the vane. The bed plate, carrying the wheel and weather vane, is supported by a peculiar truss, which obviates the tendency to sag, causing the wheel and vane to always maintain their original positions. The inventor claims that his mill can be more cheaply manufactured than any other reliable mill in the market. He is manufacturing the mills at No. 1,364 San Pablo avenue, Oakland, Cal., and informs us that he desires to sell county and State rights of his device. The mill is represented in San Francisco by D. W. Grant & Co., No. 111 Washington street.

PERSONAL.—One of our publishers, Mr. A. T. Dewey, has left us for a two weeks' jaunt in the northern part of the State. He goes for business and recreation, and we trust the ingredients may be mingled in a comfortable ratio.

THERE are 70 ships on the English stocks and shipyards being fitted for the transportation of American live stock.

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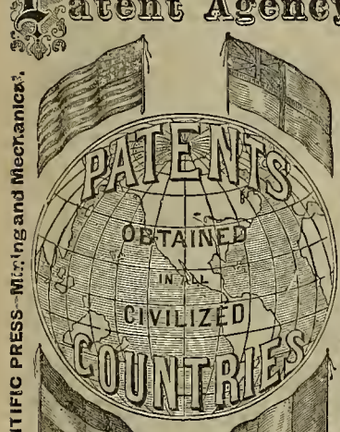

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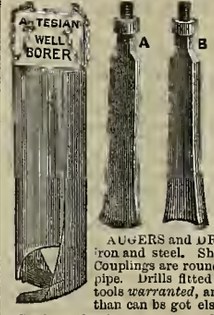

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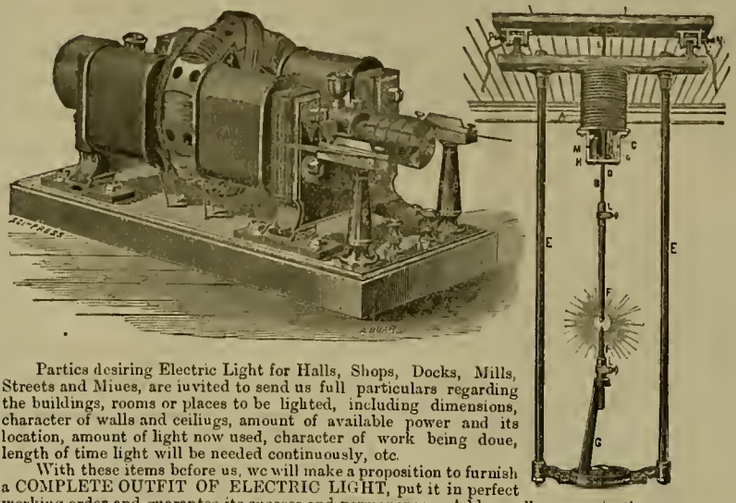

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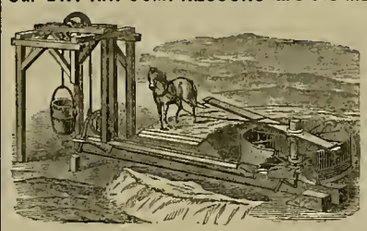

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[Continued from page 253.]

been obtained from them. The Hogdon shows a well-defined ledge.

TEM PAHUTE.—Matters at Tem Pahute look well, and work is progressing satisfactorily. The Wysndotte ledge shows an average width of about 10 ft, and is splendidly defined at the greatest depth reached by the inclines. The ore is above the average of silver-bearing ores. Mr. Killen has no doubt that the Eastern purchasers have a valuable property. Talk is that the company will erect a mill as soon as a supply of water can be obtained.

MISCELLANEOUS.—The Jackson are hoisting their usual amount of ore, and the mine is improving as the work proceeds. Some of the directors in San Francisco are expected shortly. They come for the purpose of inspecting the mine. A large ore dump has been built at the Phenix and the work of hoisting ore will be shortly commenced. The recent strike in this mine has caused a rise in its stock in the San Francisco market. At the K. K. they are engaged in cutting out the 800 station, and when finished, prospecting will begin on this level. The force has lately been increased, and a large number of men are engaged in prospecting and stoping ore on the upper levels. The working force of the Richmond has also been increased. An average of 130 tons of ore is shipped daily. A large reservoir is being built above the Albion hoisting works, to be used in case of fire Some high-grade ore has been taken out of the Alexandria mine during the past week. Their incline is now 160 ft deep, and is following the ledge, which dips at an angle of about 65°. The Eureka tunnel is now in 635 ft, and crystallized lime and ledge matter appears in the face. Recent assays yielded $300 per ton. Work has been commenced on the Wales Con., and is being pushed forward vigorously. The sum of $35,000 was paid by the Eureka Con. for labor during the month of March. Mr. H. T. Hoadley reports that the Tybo Con. is running along as usual. The Fourth of July has liquidated all its indebtedness. Work will soon be commenced, with Mr. Thomss as superintendent.

MOUNT ROSE DISTRICT.

THE NORTH MAMMOTH.—*Silver State*, April 12: The North Mammoth mine, in Mount Rose district, recently incorporated in San Francisco, is proving to be valuable property. There are eight men at work on the mine at present. They are sinking a shaft on the vein and uncovering the ledge north and south from the shaft. The lead is from three to four ft wide, and the ore assays $25 in gold and $30 in silver to the ton. The company intend sinking to an indefinite depth, and the object in uncovering the vein is to trace it down the mountain to a point where a tunnel can be run in on the ledge at a depth of 400 or 500 ft below the croppings on the summit.

THE MINER'S DELIGHT.—This mine has a vein somewhat over three ft in thickness on the surface, and a shaft sunk to a depth of 85 ft. Within the past few days they encountered a body of ore at the bottom of the shaft, which, from certificates of assay, ranges from $100 to $623 per ton.

REESE RIVER DISTRICT.

WESTERN NYE.—Grantsville *Sun*, April 9: In the 1st and 2d levels of the Alexander mine men are at work stoping. Large bodies of ore in these levels are piled up waiting to be conveyed by the car to the mill. On the track floor between the 2d and 3d levels, the amount of ore in sight is very large. In the 4th level, work in the crosscut is progressing finely, about 14 ft having been run. The crosscut is in good sulphuret ore.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, April 12: The owners of the Independence are timbering the drift; are satisfied with developments. The Alice is improving in quantity and quality of ore. In the southwest extension of the Alice, at a depth of 32 ft, fair ore has been developed. A new discovery, on Eagle creek, of ore-bearing copper and silver. The ledge is reported from 10 to 12 ft wide, and assays have been made from it which gives from $200 to $300 in silver. The La Plata mine, in Richmond basin, is looking splendid. The shaft on the main ledge is now down 35 ft, with three and one-half ft of ore in width, which will average $200 per ton.

IMPORTANT IF TRUE.—*Sentinel*, April 12: Castle Dome landing reports that water has been struck in the Arkansaw shaft, in such quantity as to drive the miners out of the bottom, no preparation having been made for bailing or pumping. This shaft cannot be much over 200 ft in depth. All water heretofore used at the mines has been hauled from the Colorado river, 18 miles distant. Yet the mines have been worked continuously and profitably for 10 or 12 years past. The striking of water there in considerable quantity will revolutionize the whole camp. All work hitherto has been done under windlass, and usually abandoned at depth exceeding 150 ft. With water, steam hoisting works can be put up, and the rich scams of lead ore followed down indefinitely. Some change is likely to occur in the character of the ore below water-level, but the change will probably be for the better. Immense quantities of lead ore mixed with spar for profitable shipment or reduction have been found at Castle Dome, which can be utilized, with water, for stamping and concentration works.

COLORADO.

LEADVILLE NEWS.—Cor. *Tribune*, April 0: About half a mile to the south of Fryer hill, and separated therefrom by Stray Horse creek, lie the Crescent, recently sold to New York parties; the Carbonate, Little Giant, and Ætna, very valuable mines, and all yielding paying ore in large quantities. Still farther to the south is Iron hill, upon which are situated the celebrated Stevens iron mine, the Bull's Eye, Iron Hat, and Hidden Treasure. The first named mine is believed by many to be the richest in the district, while all the others turn out rich ore in profusion. The Iron mine is perhaps the best worked in the camp, or rather the most systematically operated. The ore is of the richest quality, and it is claimed to be inexhaustible in quantity. The amount of ore in sight is fabulous. To the east, and separated from Iron hill by California and Iowa gulches, is Long & Derry hill, upon which are to be found the J. D. Dana, Porphyry, and Faint Hope, the rich mining property of the Messrs. Long & Derry. These mines are situated very near the summit of the mountain, at an elevation of upwards of 11,500 ft; are difficult of access, but exceedingly rich and productive. Ore taken from these mines is sold for $3 per pound. The grade is very high and little is sold to the mill even here, the most of it being put in sacks and shipped to Omaha, St. Louis, and Chicago. The first workings of these mines were exceedingly irregular and entirely without system, the desire of the discoverers seeming to be to find out if there was sufficient ore to justify working. None of them are now worked to anything near their capacity, for the reason that the fortunate owners have no pressing need for money, and are, in consequence, able to await cheaper rates of transportation and better prices for bullion. Other claims immediately adjoining the Long & Derry mines are being rapidly developed, with indications of the most promising character. Among these are the Last Chance, Wide Awake, and Homestake, all in excellent localities, with near prospects of rich paying ore. The best paying localities are found to be upon the four hills already named. There may be as rich deposits upon some of the other hills in the vicinity of Leadville, but as yet there are no mines sufficiently developed to warrant the statement. There are several claims in the vicinity of the Breece Iron mine that present excellent indications. The Flower of Edinburgh, located on Little Evans gulch, a mine comparatively unknown to the mining world, has been sold to Chicago parties. About 12 ft below the surface a solid bed of mineral was struck, said to be 20 ft in thickness, specimens of which assayed from 40 to 51 ounces in silver and 30% lead. The character of the ore is similar to that found in the Camp Bird, the Adelaide and Pine Lodes.

IDAHO.

ALTURAS ITEMS.—Cor. *Statesman*, April 12: The Vishnu company have been compelled to abandon work in their mine for the present, on account of too much water, but they have over 100 tons of good ore on the dump which is now being crushed. This mine is owned by George F. Settle and Jacob Reeser, and is one of the best paying gold mines in Idsho. Hon. George M. Parsons is one of the lessees that have worked it for the past three years. The Alturas mine, in Blake's gulch, is another important auxiliary, and has been worked during the past winter by six men. Thomas L. Johnson is the "commander in chief." The Wide West has yielded 150 tons of fair ore since the tunnel was completed, and the John Sheffer, owned by Pearson & Co., has also been doing as well, if not better, than the year before. Jacob Reesor has had four men at work on the Independent, and although the vein is small, the rock is rich and will pay well. A number of other mines are also turning out pay rock, so that the mills and arastras will have enough to do as soon as they start up.

BOISE RIVER.—*World*, April 12: Two hydraulic pipes are running on separate claims 10 miles below Mr. Buckley's ground. They have been in operation about a week, and the prospects are good. Mr. Buckley has reliable information that a man who is shoveling into boxes on the opposite side of the river is making $4 per day. There will be no trouble in working any of the bars, as the tailings will be dumped into the river and carried away by the large body of water.

NEW MEXICO.

MINING NOTES.—*Grant County Herald*, April 5: Repairs on Bremen's mill are progressing rapidly, and everything will be in running order by the middle of next week. J. M. Campbell, a practical machinist who has been for a long time connected with Fraser, Chalmers & Co., of Chicago, has arrived to take charge of the mechanical department of the mill. During the time that work has been suspended, the ore wagons have been busy, and some 350 tons, from the Seventy-Six mine, have accumulated in the bins. Mr. Bremen has also struck a remarkably rich body of ore in his new mine in Chloride district. This is the "Lily" purchased from J. G. Ward and relocated with adjoining ground. The new location covers 1,500 by 600 ft, and has been named the Baltic mine. Mr. Bremen struck a body of ore here soon after commencing operations, the average of which will run at least 65 ounces to the ton, while specimens, some of them weighing 40 to 50 pounds, will assay up into the thousands. About 70 tons of this ore have been taken out and delivered at the mill, and the mine still shows up as well as when the metal was first struck. Three hammers are at work on the Baltic. The Seventy-Six mine is now the deepest in the county, work on the main shaft having been pushed to the depth of 250 ft. Work will be renewed here next week. When the mill starts up, Mr. Bremen will take personal charge of the treatment of his ores.

OREGON.

RYE VALLEY.—Bedrock *Democrat*, April 9: Placer mining in Rye valley and vicinity is running in full blast, although with a limited supply of water there seems to be fair headway made. In many places the bars or flats are deep, requiring a large quantity of water to carry off so much debris; the ditch company are piping on a 60-ft bank, running night and day, and clearing $100 per day. The Rye Valley mill and mining company are, as usual, carrying on operations in and around the mine; having attempted to sink a winze recently, without the aid of a pump, the water being to much to handle by hand after reaching 20 ft in depth, the project was given up until the arrival of Supt. Fisk from Portland, where he is now procuring the necessary machinery, in the meantime work is progressing, running west in the drift, which shows a body of very rich ore.

MINING NOTES.—*Sentinel*, April 12: Piping still continues at the Centennial, at Willow springs, with every indication that the ground is paying well. The claim of V. S. Ralls, at Willow springs, is paying five ounces per day for the work of four hands, ground sluicing. Chinaman Lin's ground is evidently better than it was last year, when it paid over $100 per day to the pipe. Frank Ennis is pushing work at the Sterling. He is working in rich ground and there is every indication of an immense wash up. News from Silver creek is still favorable. A piece worth nearly $700 has been found in the claim of Black & Co. News from Briggs creek, in Josephine county, is flattering. Ferren & Co. have recently found some heavy gold in their claim, one nugget weighing $37 and another $26, being found in the gravel three ft from the bedrock.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

THE NORTH STANDARD G. & M. Co.—Object: To operate in Bodie. Capital, $10,000,000. Directors—J. McMechan, Bernard Lande, A. Burr and H. C. Van Dyck.

WESTERN G. & S. M. Co.—Object: To operate in Bodie. Capital, $10,000,000. Directors—J. McMechan, Bernard Lande, A. Burr and H. C. Van Dyck.

CARSON RIVER M. Co.—Object: To mine for coal in Washington Territory. Capital, $1,000,000. Directors—W. S. Rosecrans, Horatio McPherson, J. R. Erringer, I. W. Smith, J. F. Brodhead.

TACOMA COKE & IRON Co.—Object: To manufacture iron in Washington Territory. Capital, $500,000. Directors—C. A. Henry, J. A. Pickens, W. S. Rosecrans, John R. Erringer and J. F. Brodhead.

MONTEZUMA G. & S. M. Co.—Object: To operate in the Canton De Rayond district, State of Chihuahua, Mexico. Capital, $50,000. Directors—Samuel Hendy, Theodore A. P. Brown, Clemens Hohwiesner, Arthur Sincock and J. H. Miles.

WORTH READING.—This volume, the "Pacific Rural Handbook," contains a series of brief essays and notes on the culture of trees, vegetables and flowers, adapted to the Pacific coast; also, hints on home and farm improvements, by Chas. H. Shinn. "Enthusiasm," to quote our author, "is the birthright of youth;" but we defy anyone, though he may long have passed the period of such heritage, to seat himself to a careful perusal of these pages without becoming enthusiastic. Their merit lies in literary worth as well as in horticultural lore. The voice of experience speaks through gracefully turned sentences, which abound with sentiments of culture and refinement, and thrill with the accents of one whose heart is in his work. We read, and we long for the wings of a dove that we might fly away to that golden land where the fertile valleys, mysterious storehouses of houndless treasures, are lifting their flower-garlauded faces beneath the protecting shadows of the everlasting hills. The work is especially designed to aid the cultivator of the Pacific coast, but scores of useful hints can be gleaned from it that will prove applicable to our own colder climate. San Francisco: Dewey & Co. Price, post-paid, $1.—*Prairie Farmer, Chicago.*

THE NOTICE in our columns of an engineer who is desirous of coming to California, refers to one whom we believe to he an ahle gentleman, whose permanent establishment on this coast would be a favorahle acquisition to our building and progressive interests.

News in Brief.

A METEOR fell lately in Chicago.

NEW YORK has had an earthquake.

HAY sells for $13 a ton at Olympia.

HAY cutting has hegun in Napa county.

PEOPLE in Bolivia are suffering from starvation.

A LIGHTHOUSE is to be built on Point-no-Point.

THE widow Oliver has entered the lecture field.

AN attempt has been made to assassinate the Czar.

OVER 1,000 Nihilists have been arrested at Charkoff, Russia.

THERE is great suffering among the hlack immigrants in Kansas.

A REPUTABLE oooking school has heen opened in Boston.

UNION COLLEGE is admitting women on the same plan as Harvard.

THE manufacture of sherry wine has been commeuced in Napa county.

TWENTY-SIX tourists have so far entered the Yosemite valley this year.

AT Szegedin, Hungary, 17,000 persons are still suhsisting on charity.

PRESIDENT HAYES is getting ready to veto the army appropriation bill.

A VEIN of anthracite coal was recently found in excavating at Washington.

THE Petaluma broom factory last season made 1,500 dozen hrooms.

SIXTEEN THOUSAND persons in the prisons of the United States are unemployed.

OF the 27,000,000 inhahitants of Italy, 14,000,000 can neither read nor write.

WITHIN the past year eight Mormon girls have married colored men in Salt Lake.

THE festive grasshopper is gnawing the grass and vegetahles in the vicinity of Provo, Utah.

MOST of the natural ice used on the coast is manufactured and stored on the Truckee river.

ARMS for the Zulus are heing shipped from New York, presumahly through Russian influence.

A CONVENTION of colored men is soon to meet at Milwaukee, to discuss Western colonization schemes.

TULARE LAKE continues to fall, and the shore is heing hought from the State as fast as the water recedes.

THE Silver City jail was destroyed by the late hig fire, and prisoners are now confined in a stone cellar.

THE electric light has heen found a valuahle accessory for surgical operations in dull weather and after dark.

ON the third inst. there was something like a cloud hurst in Soda Springs canyon, five miles east of Lower Lake.

WOMEN have recently heen elected to the superintendence of schools in several New Hampshire towns.

TWO of the principal streets of Paris have had their names Americanized to Rue Lincoln and Rue Washington.

JOSIAH BACON was found dead in his room at the Baldwin hotel on Sunday under very mysterious circumstances.

THERE are 100 hostile Indians encamped on the middle fork of the Salmon river, Idaho. Settlers are hecoming uneasy.

THE first Indian ever sworn in a court of justice, in Nevada, lately testified against a white man for selling him whisky.

THE distance from Yuma to Tucson by the new railroad route will he 247 miles, a saving of 53 miles over the old stage route.

FRED DOUGLASS attrihutes the colored exodus from the South to attempts of the whites to again reduce the hlacks to slavery, hy overcharging, etc.

THE first marriage in this city, according to Chinese rites, took place lately, hetween Chas. Jamison, Chinese interpreter, and a Chinese girl named "Alice, the Angel."

TWO rival colored preachers in Texas, joined by their factions, came to hlows in the church. The preachers went home on shutters, and the police clubbed the rest to snhmission.

AN ITEM IN THE HOMESTEAD ACT.—The Register and Receiver of the Land Office in this city have issued a circular calling attention to a decision of the Commissioner of the General Land Office dated March 8th, to the effect that the Homestead Act requires residence, improvement and cultivation on the part of those who locate land under it. Therefore they say: "It will, therefore, he useless to send testimony to this office, unless it he therehy clearly shown that the claimant cultivates part of his claim. As to the least number of acres in cultivation that the Hon. Commissioner will consider a compliance with the law, this office is not informed." This announcement of the land authorities should be heeded hy those closing homestead entries.

THE Richmann drill and compressor works, of Arnold & Richmann, 13 and 15 Fremont street, are now preparing to make their patent drills and compressors on a large scale. This drill is a new invention which has accomplished some wonderful results. It is extremely light and requires only slight power to operate. We shall shortly describe the machine in detail, and meantime anyone interested can see it at work hy calling at the above address. The invention is worthy the attention of all mining men interested in machine drills.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING APRIL 1ST, 1879.

213,802.—GAG-RUNNER FOR HARNESS—Wm. M. Blain, Salinas, Cal.

213,814.—COMBINED WRITING DESK AND WORK TABLE—E. Emanuel, S. F.

213,902.—WATER AND STEAM COCK—Wm. H. Hoyt, Sacramento, Cal.

213,833.—STEM-WINDING AND SETTING WATCH—J. Bauer, Petaluma, Cal. (assignee of U. Opplinger, Chaux-de-Fonds, Switzerland.)

213,839.—BARREL-TAP—E. J. Rubottom, Spadra, Cal.

213,835.—WATER CLOSET—F. Pohley, S. F.

FOR THE WEEK ENDING APRIL 8TH, 1879.

214,080.—LATCH—P. H. Baker, S. F.

8,664.—HATCH FOR STREET ELEVATORS—Philip Hinkle, S. F. (re-issue.)

214,138.—CULTIVATORS—S. B. Holly and J. Jones, Stony Point, Cal.

214,145.—SICKLE GRINDERS—T. J. Hubbell, Yountville, Cal.

214,158.—VENETIAN BLINDS—Thos. Langdon, Castroville, Cal.

214,055.—EXTRACTING PRECIOUS METALS FROM ORES—Jno. A. Robertson, Oakland, Cal.

——The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

A COPPER-PLATED FURNACE.—The Clifton copper mines situated in the extreme eastern part of Arizona, have long heen remarked for the richness of their ores, which are said to carry on an average some 50% or 60% of metal. Being suhject to several hundred miles of wagon transportation over a harren country these ores would not hear shipment to market, notwithstanding their richness, and, therefore, had to he smelted on the ground. But, owing to a lack of ordinary facilities, the smelting of these ores at the mines proved so expensive that the owners, Messrs. Sesinsky & Co., exercised their ingenuity to effect such improvements in their furnaces as would tend to reduce the same. This it seems they have at last accomplished through the introduction of copper-plated furnaces, which, cheap and simple in themselves, have also proved very durahle. These works employ 200 men, and it is expected that the output of metal will henceforth he large, uninterrupted and profitable.

Iron in New Zealand.

In our advertising columns will be found a remarkable invitation addressed to the Iron Masters of of Europe and America by the government of New Zealaud. The two great Islands which form that rapidly prospering colony are remarkably rich in iron and coal of excellent quality. The government has within a few years constructed over 1,000 miles of railroad, all the materials for which, except the sleepers, have been carried out at a heavy charge in the way of freight, etc., from England. Yet the Public Works Department of the Colony is even still, with so many lines laid down and working with a dividend, only perhaps at the outset of its labors. The present Minister of Public Works, Hon. James McAndrew, has determined to make a bold experiment to naturalize the iron industry in the Colony, and has in the terms of the notice which we publish to-day, called for tenders for 100,000 tons of steel rails (or any portion thereof) to be manufactured in the Colony from New Zealand ores. A pamphlet containing the fullest information on the subject, illustrated by maps and plans, has been published by order of the government, and may be had from the Agent-General of the Colony, Sir Julius Vogel, K. C. M. G., at 7, Westminster Chambers, by Iron Masters and others desirous of obtaining authentic information on the sublect.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

AN ENGINEER, favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design stationary, marine, locomotive, mill work, sugar and hydraulic machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams, 1867. The most complete treatise. Published at this office. Price, $7.50. Postage, 50 cents extra.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

WATSONVILLE, July 29th, 1878,

MESSRS. DEWEY & CO.—*Gents*:—I was not expecting my patent so soon. You certainly kept your word when you said no time would be lost. I remain, yourstruly,

W. T. EASTERDAY.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

LEATHER.

(WHOLESALE.)

WEDNESDAY, M., April 16, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil, doz	48 00 @60 00
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	53 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ulmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
ot Lo egs, French Calf, pair	4 00 @ —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
eather, Harness, lb	35 @ 38
LFair Bridle, doz	48 00 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	18 @ 21
Wax Side	17 @ 80

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, April 16, 3 P. M.

SILVER, 1¼@1¼.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₰ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾, Commercial, 50; Paris, five francs ₰ dollar; Mexican dollars, 88½@89.

LONDON Consols, 97; Bonds, 103.

QUICKSILVER in S. F., by the flask, 32 lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 15, 1879.

HIGHEST AND LOWEST BAROMETER.

Apr 9	Apr 10	Apr 11	Apr 12	Apr 13	Apr 14	Apr 15
30.254	30.066	29.995	30.013	30.055	30.190	30.278
30.152	29.998	29.853	29.904	29.951	29.999	30.238

MAXIMUM AND MINIMUM THERMOMETER.

57.5	56.3	50.7	60	53	57.3	59
47	47	46.5	40.2	40.5	52	48

MEAN DAILY HUMIDITY.

63.3	64.7	67	30.3	31.7	31	62

PREVAILING WIND.

W	W	W	SW	SW	W	W

WIND—MILES TRAVELED.

204	228	338	213	206	233	246

STATE OF WEATHER.

Clear.	Cloudy	Clear.	Cloudy	Rainy	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

	.24			.13	.12	

Total rain during the season, from July 1, 1878. 21.25 in.

SUMMER-FALLOWING LAND FOR SALE OR RENT upon the most reasonable terms—in subdivisions of from 50 to 1,000 acres. Climate healthy. Average rainfall over 20 inches annually. Crops sure. A diversity of semi-tropical and other fruits, corn, vegetables, etc., raised with ease. Address for particulars EDWARD FRISBIE, proprietor of the Reading Ranch, Anderson, Shasta Co., Cal.

A VALUABLE MINING BOOK.

BY J. S. PHILLIPS.

The Explorers', Miners' and Metallurgists' Companion, 682 pages, 83 illustrations. Second Edition. A California publication.

OPINIONS OF THE PRESS.

The book is exactly calculated to suit the views and meet the requirements of those for whom it has been written.—*London Mining Journal.*

The most practical and comprehensive work on mining subjects extant, and valuable book of reference.—*Mining and Scientific Press, San Francisco.*

We know of no work on these subjects in the English language at once so comprehensive, practical and intelligible.—*S. F. Golden Era.*

He has rendered to the leading industry of the coast a valuable service—has furnished the millman and miner a safe and much needed practical guide.—*Overland Monthly.*

This book, which treats in an intelligent and practical way on almost every topic connected with mining pursuits, should be in the hands of every millman, metallurgist, prospector and miner on the Pacific coast. Even the capitalist, and, in fact, every person already engaged in, or likely to become interested in the business of mining, will find in this comprehensive work an amount of information that they cannot afford to dispense with.—*S. F. Commercial Herald.*

This book is free from trash, and solid throughout; all its matter is intelligible to men of ordinary education, and all of it is valuable to miners.—*S. F. Daily Alta.*

In the several sections the work is eminently practical. Is very comprehensive, and contains a great deal of useful information which cannot be obtained from the previous books that have been written on these subjects.—*S. F. Daily Examiner.*

It affords a vast quantity of information as to the appearance and value of different ores.—*S. F. News Letter.*

It is the best single English treatise we know for the use of prospectors and practical miners.—*The Engineering and Mining Journal, New York.*

Sold by Dewey & Co., at this office. Price $10.50.

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco, at favorable rates. Send stamp for our circular and samples.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Mount Jefferson Milling and Mining Company.

—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors held on the 21st day of March, 1879, an assessment (No. 6) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 318 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 2d day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 27th day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco, Cal.

California and Oregon Land Company.—

Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 2) levied on the first day of March, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Allen, J O	130	400	$100 00
Pond, E B	120	50	20 00
Woodsum, O P	106	100	40 00
Woodsum, O P	107	100	40 00
Woodsum, O P	108	100	40 00
Woodsum, O P	100	100	40 00

And in accordance with law, and on order of the Board of Directors, made on the first day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Saturday, the tenth day of May, A. D., 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of Works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Directors, held on the tenth day of April, A. D., 1879, an assessment (No. 41), of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the company.

Any stock upon which this assessment shall remain unpaid on the twelfth day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the tenth day of June, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco, Cal.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	38	700	35 00
Edwards, J E	39	700	35 00
Cautier, Custave	150	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public suction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

POSTPONEMENT.—The sale of delinquent stock of the above named Company is hereby postponed until Tuesday, the Sixth day of May, 1879, at the same hour and place. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

Union Stone Company.—The Regular

Annual meeting of the Union Stone Company of California for an election of a Board of Directors (to act as Trustees) to serve the Company for the ensuing year, and for such other business as may properly come before the meeting, will be held at the office of the Secretary of the Company at 237 First Street, San Francisco, California, on Tuesday, April 8th, 1879, at 11 o'clock A. M.

R. F. KNOX, Secretary.

San Francisco, March 20th, 1879.

The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana-British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
F. LYSTER.....Acting Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

ITALIAN OPERA.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

THE SHAUGHRAUN.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

GRAND OPERA HOUSE.

THOMAS MACUIRE.....Manager.
FRED LYSTER.....Acting Manager.

THE PASSION PLAY.

Mission Street, near Third. Box office open daily.

New Zealand Steel Rails.

TENDERS INVITED.

To Iron-Masters—Wanted—100,000 Tons of Steel Rails, to be Manufactured in New Zealand.

PUBLIC WORKS OFFICE, Wellington, New Zealand, November 6th, 1878.

Written TENDERS will be received at Wellington by the Hon the Minister for Public Works up to the 30th day of September, 1879, for the supply of the whole or any portion of 100,000 tons of STEEL RAILS, to be manufactured within the Colony from New Zealand ores. Payment will be made in cash on delivery at the Works—the government of New Zealand agreeing to pay, in addition, one half of the cost of conveyance to the Colony by sea of the workmen to be engaged in the manufacture.

Information as to the mineral resources of New Zealand, and maps indicating the various localities in which mineral deposits are situated, in relation to means of transport, may be had on application to the Agent-General of New Zealand, 7, Westminster Chambers, Victoria Street, London, or to Walton W Evans, Esq., 66½ Pine street, New York.

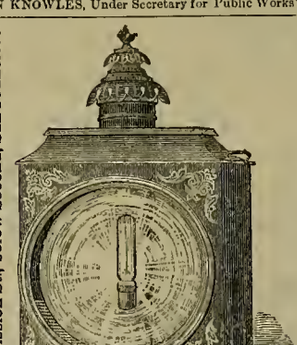
As it is unlikely that intending contractors will enter into an engagement of the above nature without first satisfying themselves by personal inspection as to the position and extent of the raw material in New Zealand required for the manufacture of iron, every facility and information on this subject will be afforded on application to Dr. Hector, C. M. G., F. R. S., Director of the Geological Dep't, Wellington.

For the information of parties desiring to tender, it may be stated that the official returns show that there were imported into New Zealand within the last eight years, 15,500 tons of cast-iron, and 93,000 tons of wrought iron, exclusive of iron for government and other railways, during which period 1068 miles have been constructed and opened for traffic.

New Zealand colonists who may have friends and correspondents connected with the iron manufacture are requested to be good enough to draw attention to the highly advantageous and profitable field for enterprise which this Colony presents to those who can bring the necessary capital and practical experience to bear upon such manufacture.

JOHN KNOWLES, Under Secretary for Public Works.

EMILE BOESCH, (Patentee and Manufacturer), 569 Mission St., below Second, San Francisco.



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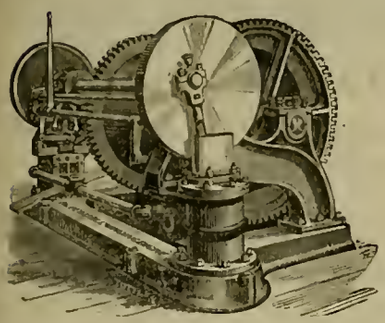

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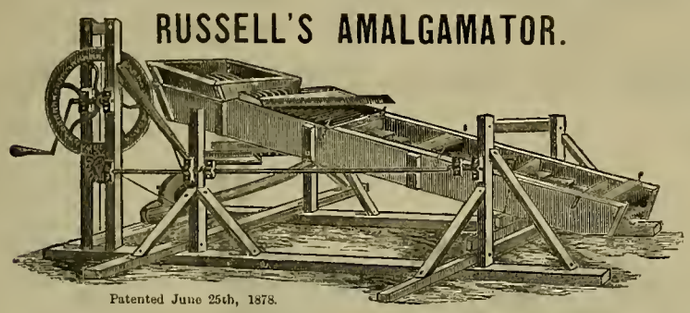

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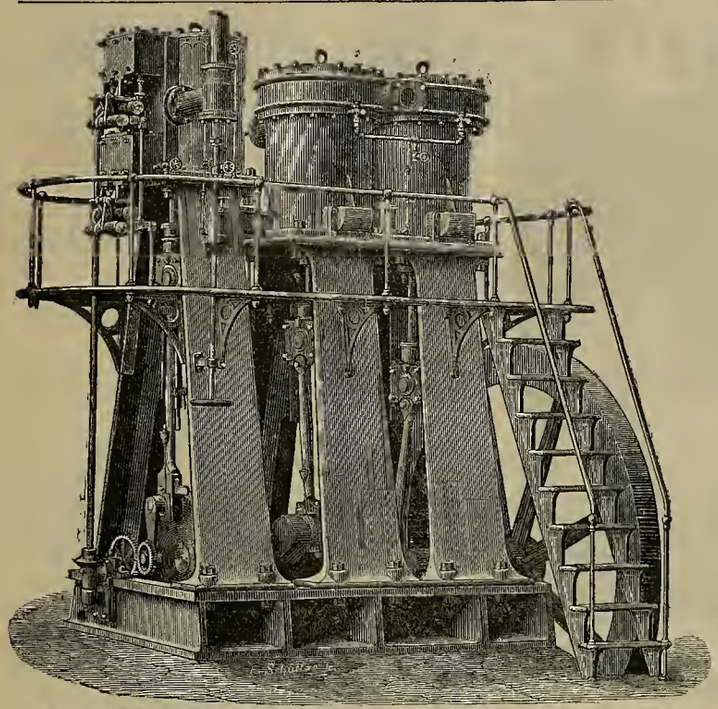

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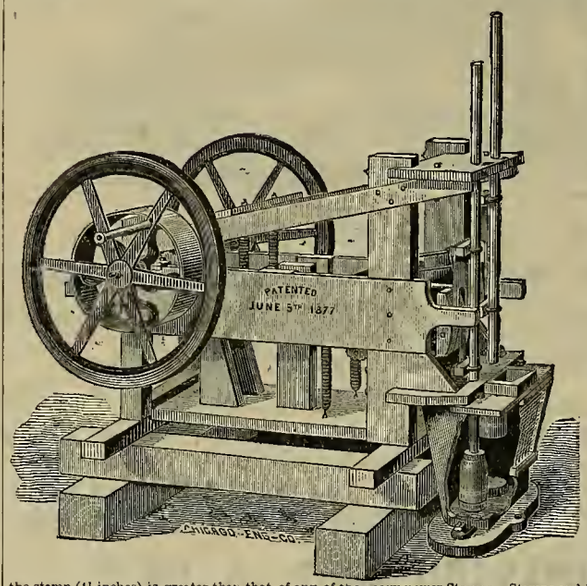

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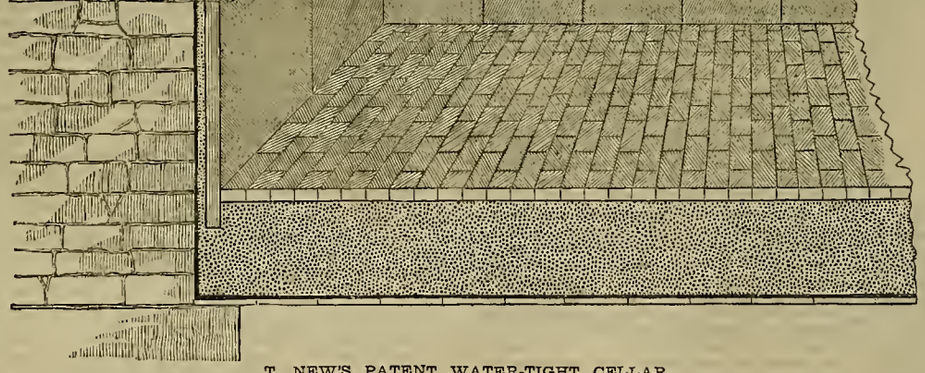
Waterproof Cellars.

It is not enough to have pure air and pure water in the house we live or do business in, but it is equally necessary that the health of the occupant should be looked after by having perfect ventilation, heating and drainage. Were it not for the trade-winds that blow in from the ocean during the summer months that carry away the exhalations arising from imperfect sewerage of this city, our death rate would be largely increased. We have another source of evil in the exhalations arising from damp and wet cellars in that part of the city extending up from the water front to a line of Sansome street, and extending south across Market street, which has been filled in above water level with the sand taken from the sand hills in leveling. The cellars of the buildings erected on this "made land" are not, in most cases, of sufficient depth for business purposes; that is, on the part furthest away from the bay. Those nearest the bay scarcely admit of standing room, and the buildings on the water front have no cellars at all.

The buildings on Market street, near Main, have basements about five feet six inches in depth, while those on Market and First or Davis are but six feet high in the clear; the depth increases as we approach Sansome street. The noxious exhalations arising from the stagnant waters directly beneath the floors when the floors are made just above the water level and with only a film of asphaltum for covering, renders these apartments damp, and the asphaltum does not seal the exhalations like an impervious coating.

Not only that, but in many cases the property is deprived of valuable business room by not having sufficient light of story for a proper business apartment. Mr. Tobias New, of New York city, has invented a valuable device for remedying these evils by which any of these basements may be made as dry as possible, and useful for the sale of the finest dry-goods. They are entirely free from damp and moisture, even when the basement floor is six feet below the water level. With a construction of this character all the basements on the city front could be made available for business purposes.



T. NEW'S PATENT WATER-TIGHT CELLAR.

In all methods of making water-tight cellars heretofore, the inventors have had to depend on a waterproof lining of impervious materials, the pressure of the water being counterbalanced by weight being placed on the floor. It is evident that in cases where the water was deep and the foundation of the building was not sufficiently deep to allow the excavation necessary to contain the required load or weight to counterbalance the great depth of water, it would be impossible to get the necessary amount of head room; and the lower down the waterproof lining is placed the greater becomes the weight of masonry. The great desideratum has been to get some kind of construction that should offer the required resistance to counterbalance the upward pressure of water, and still occupy a minimum depth, so that by keeping as near the surface of the cellar as possible, or by stopping the water at as high a level as possible, there would be less weight of water to overcome, and of course, a proportionally less excavation and less cost of construction.

The waterproof layer is placed on the inner sides of the cellar wall shown in the engraving. The inner wall is constructed of flagstones or other suitable material of sufficient strength to resist any expected pressure from without. The floor is made smooth, with either concrete or lumber, and the waterproof lining is applied, extending also along the perpendicular walls to a sufficient hight to be above the greatest rise of water. A layer of concrete is next applied on the waterproof lining and then, across the cellar, tie rods are placed of sufficient number and strength, when combined with the weight of concrete, to resist the upward pressure of the water. The flagstones will be anchored at the top and backed up with concrete, so that the tie rods are held rigidly in their places and prevented from rising when strain is brought upon them by the upward pressure of the water. To complete the bottom and form the floor for storing merchandise or other uses, and to prevent the flagstones from being forced inward by the pressure of water and the strain of the tie rods, the latter are covered with another layer of concrete or artificial stone, or, if preferred, with a compact layer of brick or tiling. It is evident that by this construction a flat arch or truss is formed in the bottom, of great strength and sufficient to counterbalance with six or eight inches, four to six feet depth of water. The concrete below the tie rod is made to resist the upward pressure, tending to crown the floor and the tie rods, re-enforce the same by their tensile resistance, preventing an arching of the structure. The effect of the upward or lifting pressure of the water will be to bring the strain on the tie rods, and before the floor can be lifted the rods must break or the artificial stone must crush. It has been learned by actual experiment that the same amount of water can be counterbalanced by about one-third the thickness of construction now required; consequently two-thirds of the thickness of floor is saved and an equal amount of excavation.

With this construction, cellars can be made dry below tide water; and cellars now full of water may be made dry enough for the storage of silk. Cellars now unfit for use, and that cannot be rented for any price, can be made as dry as any room in the building, and when so fixed can be used for any purpose. In many cases the rent for the first year will pay for the work in making the necessary alteration.

P. H. Jackson & Co., No. 2 California street, in this city, are agents for the new patent cellar. They are also manufacturers and licensees for Pacific coast of Hyatt's patent vault lights and illuminating tiles, and Hyatt's patent basement extension roof. They will give any desired further information on the subject.

THEY have three mining academies, in Austria, for the education of engineers and officers in the higher branches of the business, and six schools for affording workmen such instructions as they most require.

DURING the three months ending March 31st, there were 2,523 failures in the United States and Territories, with liabilities amounting to $43,112,665.

NAPA county is manufacturing olive oil.

AN UNFORTUNATE CLASS OF INVESTORS.—That English mine investors should have become discouraged not to say disgusted with their experience on this coast, is not to be wondered at. With few exceptions their investments whether made in stocks, mines, tunnel or other schemes, have turned out badly. Whatever they have been concerned in has been attended with disappointment and failure. They had only to touch a living thing and it died. And yet they do not seem to have acted precipitately in making these investments. They neglected none of the usual precautions and overlooked none of the safeguards that are considered essential to success. On the contrary they appear to have acted with prudence—coolly, deliberately, with all that business acumen and commercial sagacity for which they are proverbial. They consulted what were deemed intelligent and reliable sources of information in regard to our mines; they employed competent experts to examine them; they came and looked at them themselves; and, finally, having purchased these properties and raised sufficiency of working capital, placed them under a capable supervision, and awaited results, which, in nine cases out of ten, have come only in the shape of disappointment, vexation and loss. It may well be asked how this has happened! There is something phenomenal about it. It is inexplicable! We cannot account for it, and allude to the fact because of its strangeness, and in the hope that some one, being especially informed touching the causes of these failures, so general and almost uniform, if any such there be, will vouchsafe to give the public the benefit of his knowledge.

THE LICK OBSERVATORY.—Mount Hamilton was long ago selected by the trustees of the Lick Trust as the most elegible site in the State for the location of the observatory projected by the late James Lick, and for which he provided the sum of $700.000. But the mountain has three peaks—Observatory peak, 4,302 feet high; East peak, 4,448 feet; and Middle peak, 4,318 feet, and on which of these the observatory is to be erected has never as yet been decided. Late Eastern dispatches state that on the recommendation of Prof. Newcomb, of the Washington observatory, Mr. S. W. Burnham, a Chicago lawyer and astronomer of some distinction, has been appointed by the trustees to make this selection, and he will at once proceed to carefully test their comparative suitableness, with a view to its definite location and immediate erection.

THE silver question is rapidly coming to the front in England.

Extending the Scale of Vein Mining Operations.

Prof. J. E. Clayton, now of Salt Lake, formerly a resident of California, has been discussing of late, both through the press and before the Bullion club and other financial organizations in New York, the manner in which mining enterprises should be undertaken and carried on, this gentleman contending that mining for the precious metals is not only a legitimate but a highly useful industry, and, when properly pursued, as little risky and as certain in its results as any other. In some remarks recently made by Prof. Clayton before the New York Bullion club, he advocated the policy of forming companies with enough capital to purchase entire groups of mines or even whole mining districts, as one that, by reason of the large scale on which the business could be prosecuted, would reduce the hazards to a minimum, while the chances for profit would be increased in a like ratio, instances being cited in which this plan would be especially applicable. Where, for example, the veins are small but numerous, a large success can be gained in no other way. In localities of this kind, if care is taken to find out the position of the largest and best bunches of ore, extensive reduction works may be kept in steady operation, even in districts where there are lodes of only the smallest size.

Prof. Clayton then indicated certain rules that would aid the mine explorer in locating the more valuable ore deposits in a district, such as a careful examination of the geology; also, a close inspection of the outcrop of each lode, with a view to ascertaining the length of any ore bodies that might appear on the surface, a thorough test of the ore being meantime made; the surface ore will, as a general rule, be found to indicate the average value of that met with for several hundred feet below. This is work that should be faithfully performed preliminary to anything being done underground. In entering upon this, it is of the first importance that the shafts put down and the levels run are in the proper places with reference to the outcrops and ore chutes. The pitch of the latter should be noted, so they can be opened with as little dead work as possible, and the depth at which they will be likely to pass the end lines of the locator's claim and enter that adjoining, be ascertained. Generally the pitch of an ore chute can be determined before opening up the latter to any great depth, such pitch being denoted pretty accurately by the structure of the lode and the *striæ* or grooves on its walls, these lines of movement being always present in true veins.

When a number of the principal lodes in a district have been opened up to a considerable depth, the results afford a clue to the probable value of the other lodes in the neighborhood. The danger of putting up too large reduction works is one to be guarded against. A mine should have ore enough in the reserves to repay the purchase money and put up mills at the very start, a two years' stock being afterwards always kept in sight.

NO BOTTOM TO IT.—We have the authority of Prof. Frank Stewart for saying that there is not a permanent, mineralized vein in the entire Leadville district. They have there nothing but argentiferous lead ores, which almost invariably occur in shallow beds and limited chambers. Hence the danger that the bitter experiences of White Pine will find repetition in these much talked of Colorado mines.

THE President has set aside a large reservation in Washington Territory for Chief Moses and his tribe.

Silver with the Gold.

[Written for the PRESS by A. B. PAUL.]

Whenever anyone refers to mining in the State of Nevada, silver, as the metal worked for, is inferred, and when such reference is made to California, gold is implisd; all arising from the fact that the first State mentioned is celebrated for its production of silver and the latter for its gold. I do not say this is strictly incorrect, and yet in ons sense it is, as each State produces hoth silver and gold. There are two facts, however, to hs considered in connection with this matter; first, milling in Nevada is so superior in its systems of amalgamating, that if ores contain gold they get there a hetter per cent. of it than is done in California. The other fact is that where silver is associated with the gold in the California ores, the system hy which the gold is here undertaken to he saved, viz: hy the use of stamps, copper plates and hlankets, precludes the possihility of saving the eilver. Owing to this latter fact, the opinion generally prevails that in California the "gold leade" do not carry silver. Now, I can assure those who entertain this idea that if they will make trial of 100 of the "gold mines" of this State, that 75 of them will be found to carry enough silver to pay all the expenses of extraction and reduction, provided their mille are so constructed and operated as to save this metal as well as the gold. Several years ago I made extended experiments with this class of ores and here present some of the results ohtained, and which I happen to have at hand.

Assay on five lots of *tailing*, from different places, went as follows:

	Gold.	Silver.
No. 1	10.04	3.14
No. 2	5.02	3.93
No. 3	13.55	9.28
No. 4	12.06	4.90
No. 5	4.13	6.77

From the ahove it will be seen that the average of tbese five tests was $8.96 gold, and $5.01 silver.

Two tests of concentrations went as follows:

	Gold.	Silver.
No. 1	81.40	35.06
No. 2	56.00	33.00

Showing that concentrations carry a goodly quantity of silver, all of which ie lost.

One tells us, when we speak of losing gold by hattery working, that he gets all lost in his eulphurets, which he works hy chlorination. He may in this way get a fair percentage of the gold, hut at the loss of all the silver; and this is a serious loss, if those who chlorinate will only examine *before roasting*.

Some years ago a compilation of assays made by United States assayers of per cent. of gold and eilver in tbe various mines of this State was made hy Mr. Hanks, the results of which fully establishes my position, the statement in percentage being as follows:

	Gold.	Silver.
No. 1	76.86	20.67
No. 2	86.57	12.33
No. 3	86.87	12.33
No. 4	88.75	8.88
No. 5	89.10	10.50
No. 6	89.61	10.05
No. 7	90.01	9.01
No. 8	90.38	6.80
No. 9	90.70	8.88
No. 10	90.90	8.70
No. 11	90.96	9.04
No. 12	94.00	7.00
No. 13	92.70	6.90
No. 14	93.53	6.47
No. 15	96.42	3.50

The average of the ahove tests is $89.68 gold, and $9.41 eilver. This ought to lead to investigation hy our gold miners, that they may ascertain how much silver their oree contain; for, while some may carry 20% or 30% silver, others may not carry enough to make the saving an ohject. From the foregoing it will he seen that when I deride the mode of amalgamating the precious metals generally adopted in California, I have good reason for so doing, my opinion heing founded on investigation, not mere guess work.

Crushing rock seeme to he the great ohject with California millmen—not saving the metal—make sure to get so many tons of rock through, and everything else is satisfactory, till they come to clean up, when tbere is surprise and disappointment. Crushing machiuery has been brought to perfection here.

No where else have they more powerful machinery or greater completeness of mechanical detail. But reducing ore is one thing, and proper amalgamation of the precions metals is another. Now if our ores contain say $5 a ton in silver, why not save a proper percentage of it? This would in some mills pay all expenses, and leave the gold product clear profit. Times are hard, men work for even a dollar a day, and yet there is waste enough going on in our California mills to *more than equal the present product*. If every mill in the State was used simply as a crushing machine, taking up what can he secured on copper plates, and the old Mexican arastras were put in bclow, it wonld, in my opinion, make a difference of $10,000,000 per annum in the bullion product of the State. With no other change than this, there would he euccess in scores of cases where now is only failure. In fact, failure in this State is only another name for inexcusahle waete.

In view of the past, one would he almost lead to helieve that a premium had heen offered for a device hy which the largest amount of the precious metals could he run off and lost, and that our California millmen had secured the bonus.

Papago Country.

For the past few years the *Arizona Sentinel* has heen industriously calling puhlic attention to that part of Arizona lying south of the Gila and west of the Santa Cruz, known as the Papago country. Few men traveling along the levsl deserts hordering the Gila have been ahle to comprehend that 40 miles south of that stream, and along the Sonora houndary, extends a far more attractive country; whose mountains are not altogether of lava, and whose valleys are watered hy a rainfall heavy enough to clothe them with grass and trees, and to enable the Papago Indians to raise crops of cereals and vegetahles without irrigation; to understand that its geological formation is highly favorahle to the existence of hig and rich mines of silver, copper, lead, and antimony. The persistence of their assertions has led to vigorous prospecting down in that section, and to the discovery of great mines, to which value is now heing given by construction of the Southern Pacific railroad. These mines are already attracting the attention of Eastern capitalists. Fourteen of them have recently heen honded for New York parties hy Mr. George Tyng, at $175,000. The figure is large, but the property gives reasonahle promise of heing worth it. These mines include the Gunsing group, which has already attracted some attention hy shipment of ores, which pulped from $400 to nearly $3,000 per ton. Though these mines have heen considerahly overrated, they certainly are large, etrong veins, cropping boldly for distances of eeveral hundred feet, and to widths of 10 to 40 feet. They carry a large proportion of lead, whose decomposed forms attract and deceive tbe unpracticed eye; hut they also carry rich seams of silver ore, sprinkled with particles of horn silver and wax cblorides, ahout which there can he no mistake. Mr. Tyng has sent to San Francisco for an ample etock of tools and supplies, and the true character of these great veins ie likely to be determined within a few months. It is to he hoped the result will be satisfactory, as this will lead to rapid development of many large and promising mines in the vicinity.

At first eight there appears to be a scarcity of water, but careful examination of the country must convince anyone that plenty of water can be found by wells of moderate depth. The rainfall ie considerahle; the washes and gulches made hy surface drainage do not indicate the flowing away of masses of water proportionate to the area of country drained; the eoil, and much of the bedrock, is porous; the natural inference is that its water seeps away very slowly through underground channels, or is retained by cross-dykes. This theory is supported hy the result of the few wells that have heen dug down there.

EUREKA MINING PRODUCT.—Within a radius of five miles of the town of Eureka, there are at the present time 70 producing mines, yielding in the neighhorhood of 700 tons of ore per day. The amount of ore extracted varies from 200 tons apiece, as at the Eureka Con. and Richmond, to a few hundred pounds picked out hy chloriders in the less famous properties. Some of this ore is very rich and will assay up into the hundreds, and none extracted will work less than an average of $50 per ton, and it can he safely estimated that the regular daily yield of the district will reach $35,000. Not all of this output goes directly to the furnaces, as, in the case of the emaller mines, it is stored upon the dumps until it accumulates in sufficient quantities to warrant a shipment. In some instances as much as 300 tons have heen hoisted out and stored away, waiting for roads and trails to hecome eolid, and this ore will he sent to the smelting works next month. On Prospect mountain the rock hae to he transported hy mule trains, a tedious and costly method, and one that forhids the utilizing of any except a very high grade, and it is a notorious fact that thousands of tons of second-class rock have heen exposed in the shafts and levels of Prospect Mountain claims that would pay a handsome profit for working, if there were good wagon roade leading to the apex of the mountain.—*Eureka Leader.*

THE BIG TREES OF CALIFORNIA.—Prof. Brewer points out two errors that are current about them, one relating to their hight, and the other to their age. The "Father of the Forest" is generally said to have been 450 feet high when in hie glory. The fact is, no one knows how high it was. When the grove was first seen hy white men, the prostrate tree was already part rotten, and the whole top hurned away. The highest tree in the Calaveras grove is 225 feet, and the highest in the Mariposa 272 feet. The highest in the Kings River grove is 300 feet. As to their age, their is no reason to helieve that even the eldest hegan its growth "long hefere David reigned in Israel," as people are fond of asserting. One of these trees was felled in 1853, and found to be sound to the core. Its age is known to within a few years, and it hegan its growth more than 2,500 years after David died. It is possihle that some of the oldest trees of this speciee may have hegun its growth 2,000 years ago, hut not at all prohable that any reached hack to within a thousand years of the time of the Jewish king.—*Silver State.*

A Monster Locomotive.

Uncle Dick weighs sixty-five tons, and he is sixty feet long from his head light to the rear end of his tsnder. He is the higgest locomotive in the world, and has just been turned out of ths Baldwin locomotive works for duty on the precipitious inclines of the Atchison, Topeka and Santa Fe railroad. A hoiler 21 fect long supplies steam for cylinders 20 inches 26, and gives motion to eight 42-inch drivers, while a large tank surmounting the entire structure not only carries a water supply, hut helps to give Uncle Dick a tighter grip on the rails. His driver will have control of three independent systems of air brakes, and can hring to hear at once upon his wheels a restraining force of 75 tons, which is none too large, inasmuch as a "shoe pressure" of 50,000 pounds is required to keep him, when standing still and alone on the steep road over the Ruton pass, from surrendering to gravitation and rushing down hill hy his own weight. How heavy these grades are can he underetood when it is noted that one end of Uncle Dick will often stand more than three feet higher than the other, so that in traveling his own length he will do the work of lifting ahout 250 tons a perpendicular foot. And yet thie moneter, rejoicing in his etrength, will rush up the flank of the Rocky mountains with ten loaded cars hehind him.—*Denver Tribune.*

THE BODIE PLACERS.—The excitement over our placer mines, saye the Bodie *News*, continues to increase. All are anxious to get in. Over 100 shafts have heen commenced; all that sunk to the gravel got first-rate prospects. The great difficulty in sinking is the water struck after sinking 6 or 10 feet, which will require pumps to free them so they can he worked to advantage. John Cullen and his company have the richest claim so far as opened; they find some of the richest quality of quartz that fairly sparkles with gold, others with seams of gold running through it. This will surely lead to the thorough development of the whole canyon and flat, with the almost certain probahility of finding some rich ledges. Already has ground heen taken up for quartz mining. This, of course, does not interfere with the claimante of placer mines. There are more prospective millionaires to-day, in Bodie, than any other town in the State. The shrcwd ones are on the alert to locate or snap up any claime offered for sale. The prospects are that 1,000 men will be at work in these placer minee within a month, especially if water is furnished to work them. Still we would not advise miners from other parts to come here as we have all the labor required.

COAL IN IDAHO.—The Silver City *Avalanche* saye that a 12-foot vein of coal was discovered in the vicinity of Sinker creek. Indicatione of its existence were discovered there a long time ago hy Judge Tutt and others, and within a few days he and W. H. Cooper, James Lyman, John Grete and P. Brennan, located the ground and put a small force of men at work einking pits. At the depth of six feet from the surface it has been tested hy hlacksmiths with very favorahle results, revealing a considerable portion of material for fuel in its composition. The light which comes from it ehows considerahle gas, and it is expected that the quality will improve as the descent progresses. If it should turn out to he the genuine article, and there are etrong indications that it is, it will he a hig thing for the country. There can he no douht that hoth coal and iron exist in abundance in various parts of Idaho, and that these, as well as many other of our great resources, have not heen touched as yet. Gold and eilver are not the only treasures that are hidden within these vast ranges of mountains.

WATER CONSUMPTION.—The quantity of water now heing consumed hy the Southern Pacific Railroad Company, at its construction front, is prodigous. Eight huge water-tanks are daily hauled out to the front. No water is now sold hy the company at Gila Bend. All that used hy outsiders there hae to he hauled on wagons from the Gila river, four miles distant. An additional line of pipes has heen laid from water-works to the tank at Yuma. The pumping engine is kept at work till a late hour at night. The new water-works at Texas Hill are progressing well; and will soon afford some relief to those here, the tanks are all set up and the pipe is nearly laid. The water is to be pumped up into a reservoir on a bluff near the river, from which it will flow through five miles of pipe into the tanks at Texas Hill. An artesian well is heing hored for the S. P. R. R., out on the California desert, hy a company of Chicago men, who have the finest outfit of horing tools ever hrought to this coast. Their derrick is eighty feet high. They are making good progress.

ARIZONA RAILROAD IRON.—For some time, large quantities of railroad iron have heen going through for the extension of the Southern Pacific railroad in Arizona. Hundreds of tons pass through almost every day. In the last month at least 2,000 or 3,000 tons must have gone through, and more continues to come every day. This would indicate a determination on the part of the Southern Pacific managers to push their road East very rapidly this summer. The prohahilities are that the heart of Arizona will he pierced hy a railroad inside of a year. This railroad company are not buying this iron to let it lie in idleness.—*Reno Gazette.*

The Geology of the Leadville Carbonates.

Prof. Weiser writes to the Georgetown (Colorado) *Courier* the following statement of his investigations and conclusions:

The carhonate field of Leadvills is at this time attracting more puhlic attention than any other mineral locality in the world. Scientific men everywhere are anxious to know something ahout the formation of this extraordinary locality. I havs heen engaged for soms days examining the geology of this field, and although the snow has prevented ms from making a thorough examination, yet I have seen enough to satisfy my own mind that the whole territory of California gulch, with all its lateral hranches, swells and hills, helongs to the cenozoic time and in the lower eocene of the tertiary, with the lignitic of the cenozoic just helow it, and the upper cretaceous of the mesozoic just helow that. Between the main range of the Rocky mountains, and one of the large eastern spurs, there was at one time, prohahly hefore the glacial age, a large fresh water lake, the waters of which held in solution carhonate of lime, lead, silver, gold, and iron. These minerals in the oourse of long ages were slowly precipitated to the hottom of this lake. Ages after this precipitation, and perhaps after this lake had become drained, the internal oscillation of the earth, occasioned by the motions of the liquid material of the earth, threw up the hills and swells as we now see them. The whole territory once covered hy this mountain-lake must, therefore, contain a deposit of the precious metals, together with lead, iron, lime and silica. This is my theory on the formation of the carhonate fields. I am aware that eome scientiste reject the theory of precipitation from solution in water, hut I think the majority of most advanced geologists have agreed that mineral may all have heen precipitated in water, and after its precipitation may have been disturhed hy igneous action. This is the opinion of Prof. Von Cotta in his great work on "Ore Deposits." Prof. Newhury, in "Appleton's Encyclopædia," in the article on "Mineral Deposits," also admite the water deposit. (See his article.)

The superposition of tbe carhonate, as far as my ohservations extend, is ahout as follows:

First—There is a post-glacial deposit of from 6 to 150 feet, for it eeems to vary in differcnt localities, but there is as yet not data enough to determine anything about the depth of tbis deposit.

Second—An anti-glacial deposit consisting of half-rounded houldere and gravel of from 4 to 10 feet in thickness.

Third—A deposit of calcite (here called porphyry) several feet thick. This stratum is looked upon hy prospectors as a good indication: it seems to vary very much in thickness—from a mere trace to several feet.

Fourth—An iron hand, in some places many feet thick and at others also a mere trace. This iron stratum lies on the mineral eratum, so that as soon as iron is etruck, which ie here called the point of contact, the miner knows that the mineral belt is near at band.

This mineral helt is sometimes very large, *i. e.*, wide and thick. I do not know that anything very definite has yet heen determined as to the full extent of this helt. The opinion is largely entertained here that the mineral helt is found in wavy undulations, hecause the mineral is found at some points much nearer the surface than at others. These undulations were evidently formed soon after, or prohahly hefore the lake was drained, and were caused hy the internal oscillatione of the earth, the same forces that threw up at an earlier period the Rocky mountains.

In regard to the quantity of the mineral, which is an argentiferous carbonate of lead, we have not as yet sufficient data to come to any definite conclusion, hnt from the developments thus far made the quantity must he immense. Thns at one point the mineral etratum has heen penetrated to the depth of over 40 feet, and at other points it may he even thicker. Now suppose we hase our calculation on the quantity of mineral, upon a single mine site, which in Lake county is 1,500x300 feet, it would give ahout 250,000 tons to each acre, and as there are 10 acres to each claim, we have 2,500,000 tons in a single mine; and as there are hundreds of mines already located and hundreds more to locate, some idea of the quantity of mineral here may he formed. The territory over which this carhonate field extends mayhe 30 miles long and 6 wide, making an area of 115,000 acres. When will such a field be exhausted? Verily, this is a wonderful country, the like of which the world has never seen.

CAPT. BOYNTON'S RUBBER SUIT.—The ruhher life-saving dress is in two parts, tunic and pantaloons. The latter contains an air chamher in each leg, which extends to the tops of the hoots, while the waist is girdled with a resisting steel hand, on which is mounted a flange or ridge of heavy rubher. The jointure is made hy lapping the tunic over the hand, and a similar ridge drops into the groove formed. A helt thrown over the whole makee a perfectly tight joint. The tunic contains three air chambers; one in the hreast, hack and head. When the latter chamher is inflated through the tuhe, it forms an excellent pillow, raising the head of the occnpant sufficiently to give him a complete range of vision. The suit is of most delicate construction, and yet it will resist the most terrihle breakers and seas. The face ie the only portion of the hody exposed, and this accounts for ths hronzed features of the famoue navigator.—*Cincinnati Commercial.*

MECHANICAL PROGRESS.

Improvements in Iron Production.

The grand fact in the history of iron for the last 20 years bas been the gradual hut pretty rapid substitution of the softer varieties of steel to a very large extent for wrought iron. The earlier experiments of Bessemer and some others who worked at about the samo time, were directed to the production of this latter material by a quicker and easier process than "puddling" for the removal nf the carbon of cast iron. These experiments were unsuccessful so far as the complete removal of carbou and production of thoroughly soft, pure iron was concerned; bnt they proved the feasibility of manufacturing steel diroctly from cast iron with far less expenditure of time, fuel and labor than older methods, snch as "cementation," involved, in which carbon had first to he removed, producing wrought iron, and subsequently added again slowly and in restricted amount. The new processes, moreover, carried with them the great advantage of nperation at so high a temperature that tho metal was completely fused, aud hence much more uniform in character than when masses were consolidated hy welding only from parts varying in the amount of carbon, and hence in physical properties, and retaining also in the case of bar iron more nr less romains of slag.

It did not take long to show that these characteristically new processes were not destined to replace the older ones for tho manufacture of wrought iron, properly so-called, but it was not so quickly perceived that neither were they fitted for the production of the best steel, of sucb kinds as the name had previously been most connected with, and for such uses as it had previously been most largely applied to. Gradually it became apparent that the true function of the newly invented methods was mainly the production of a new material, ontaining carbon in relatively small amount, combining the toughness and workable qualities of wrought iron with the great tensile strength, rigidity, some of the hardness, and especially the homogeneity due to practicable fusibility, of eteel. The "mild eteel" which is the essential result of the recent processes of manufacture, is not the "tool steel" which, not many years ago, was pictured in every one's mind in connection with the name steel, but it is a substance available for a far wider range of uses and applicable upon a far greater scale.

Of the various individual processes which have been proposed and tried for the rapid production of mild steel, decidedly the most successful have been those of Bessemer and Siemens; the former consisting essentially in forcing a blast of air nnder high pressure into molten cast iron in a suitahle "converting vessel," thus rapidly burning out the carbon and silicon, mixing with the fluid metal a determined amount of separately fused cast iron containing a known amount of carbon, and casting the product into ingot molds; while the latter brings into play the admirable peculiarities of the gas furnace, by fusing together at the extremely high temperature which it affords, and in the entirely controllahle chemical atmoephere of its hearth, pig iron and scrap wrought iron, as suggested hy Martin, or pig iron and iron ore (an oxide) on the plan of Uchatius, hut on a much greater scale in either case, so apportioning the carhon and iron left together in the fused product that steel of the required character shall be obtained. In a sense it may he said that the invention of Siemens, leading to the manufacture of "Siemens-Martin" and "Landon-Siemens" steel, has supplemented the Bessemer converter, and hy providing a way for profitahly using up vast etores of old wrought iron already on hand, has permitted the more rapid substitution of eteel manufactured by both methods. By these two processes, within the last two or three years an annual product of more than 2,500,000 tons for the world at large hae been turned out.

During the period in which so much attention has been concentrated upon steel, much has been learned in refereuce to the effect in its production and upon its properties of even very small quantities of other elements than iron, though much still remains to be ascertained in thie direction. The most important points which have been ascertained are those in regard to the benefit derivable in the manufacture, particularly of Bessemer steel, from the presence in the iron of manganese and silicon, tbe chief function of the former being the removal, to some extent, of sulphur, phosphorue and oxygen, which, if allowed to remain, greatly impair the mechanical excellence of the product, while they exhibit a stronger tendency to combine with manganese than with iron, and thue get carried off into the slag; eilicon, on the other hand, aiding by its combustion to keep up the high temperature in the converter which maintains the fluidity of the metal, and uniting, when hurned, with the hasic oxides to form and eeparate from the metal a removahle form of fluid elag. The observed benefit arising from the preeence of theee two euhstancee has stimulated the production, for use in connection with ateel-making, of cast iron rich iu eilicon, of crystalline "epiegel-eieen," containing a large and uniform amount of carhon along with manganeee, and lately of alloye of iron and manganese—the so-called ferro-manganese—containing, as in tbe product of the French Terro-Noire works, up to 65%, and even 85% of the latter metal.

Another point, and of unexpected character, has but lately been ascertained—namely, that if the percentage of carbon in steel be reduced, phosphorus may bo admitted to an extent which would be seriously injurious if the normal amount of carbon for the kind of steel required had been present. Some remarkablo specimens of steel from works ou the Siemens-Martin plan, iu New Jersey, in the possession nf tho writer, illustrate this distinctly.

Notwithstanding the numorous attempts, too often reported on by interested parties, to produce valuable alloyed forms of iron or steol by additiou of other metals, most of which attempts have led to no permanent results of real importance, it remains much to be desired that a systematic examination should bo made by impartial hands of the alloys of iron, with and without the presence of carbon, trustworthy analyscs being made of the products, and at the same time their physical charactere submitted to well-defined tests. Up to this time the only two of the more refractory metals which seem to have proved themselves capable of influencing in any useful way the properties of steel, are tungsteu and chromium, which give hardness, accompanied, however, by iucreased brittleness. The increase of retentive capacity for magnetism which tungsten is reported as producing, may perhaps prove valuahle in the construction of dynamo-electric machiues.—*American Chemical Journal.*

Hahn's Iron Scaffolding.

Mr. Max Hahn has inveuted a new scaffolding composed of iron pipes, which no doubt is superior iu many respects to the old wooden scaffoldings usually erected for huilding purposes. The number of accidents arising annually from iusecure scaffolds is yet very large, and this circumstance alone would make the general adoption of iron as a material for ecaffoldiugs advisable. But there are yet other advantages connected with this invention. The new scaffolding is easily transported, pnt together and taken apart; when not in use it takee up but very little room; it is very cheap, as it is almost indestructible. Besides, it does not hide the building from view, but permits a free inspection of the progress of the work.

The scaffolding cousists of two rows of four-inch iron pipes, sunk about three feet into the ground and resting on piecee of hoard. They are provided with sockets, at regular intervals, which take up the horizontal pipes, which are three inches thick. They are firmly connected by cyliudrical couplings, consisting of pieces of pipe strengthened at the ends hy riugs of wrought iron and fastened by screws.

The horizontal pipes are provided with holders receiving tbe puttocks, which are lastly placed in position. The thicknesses of the pipes varies for each story. While for the lower story four-inch pipes are used, those used for the fifth story only measure three inches. Two men can easily put up the entire scaffolding in lese than a day. The area of cross section of the pipes may he one-third smaller than that of timber of correspending etrength, or allowing the same dimensions, the strength and safety will be increased 33%.

A New Railroad Tie.—At the regular monthly meeting of the Eogineere' Club of Philadelphia, a model of an iron railroad tie, which is being tried on the Philadelphia & Baltimore Central railroad, was exhibited. The device dispenses with all spikes, bolts, nuts or fish plates, and drilling or punching the rails, avoiding fractures from such causes. The iron tie, it is claimed, will outlast 12 renewals of the ordinary tie at one-half the cost to keep in repair. Each tie is recessed under its rails, and along the bottom of the recess wedge-shaped pieces are cast transversely. At the sides of each recess are creosoted hlocks, which form a cushion and a fulcrum for two clamps, which grasp the flange and weh of the rail above, hearing upon opposite faces of the wedge below. The weight of the train forces the clamps upon the wedge, epreads them at the bottom and grips the rail. The first cost is eomewhat greater than the wooden tie, hut it is said to offset this in durability.

Case-Hardening Iron.—In order to economize in the more expensive materials for case-hardening cast, wrought or malleable iron, and to harden only portions of the article in different degrees, if required, Mr. Gracie S. Roberts, of Brooklyn, England, makes uee of an improved method. After polishing the eurface, he gluee to the portions to be case-hardened a coating of yellow prusaiate of potash. A number of coats are given, according to the degree of the case-hardening required. A cheaper material or simply honehlack is used where a eligbt effect only is required. When the glue is eet hard, the article is packed in powdered charcoal, heated to redness in a quick fire and maintained at that heat for half an hour. Then it is hardened and tempered in the usual manner.

Steel and iron raile have become nearly of the eame price in Europe. At a recent letting in Belgium, the loweet price at which iron was offered, was hut $2 per ton less than for steel, and the great Cockerill Worke of Seraing bid the eame price ($26.25 per ton) for iron and for eteel, heing the loweet bidder for eteel. Very little difference is made in England aleo, and it ie probable that really good iron rails would coet just as much as eteel.

SCIENTIFIC PROGRESS.

A New Instrument for the Mineral Analyst.—At a recent meeting of the Philadelphia Acadomy of Natural Sciencies, Prnf. Kœuig, of the Uuiversity of Peuusylvania, exhibited wbat he calls a chromometer (or color-measurer), a now instrument be has designed for mekiug exquisitely delicate determinations of the presecuce of certain metale in oree. It ie based on tho optical fact that complementary colors will extinguish each other if mixed in proper proportion—*e. g.*, if to a green solution a red solution he added iu euitablo proportion, the liquid will hecome colorless. Prof. Kœnig has applied this principle to tho colors which certain metale as iron, manganese, copper, etc., produce when fused with borax, the only chemical used in this method nf analysis. He preparee such glasses or beads contaiuing kuown quautities of a metal in 100 parts, and observes how thick a glass of the complementary color must be to produco extinction. This chromometer is furnisbed with a glass wedge of a green or red color, cut at an angle of ahout 1°. By moving this wedge before the glass bead witb the belp of a suitahle rack movemeut, a scale is moved at the same time, and when the point of extinction of color is arrived at the reading of the ecale refers to a table shewing the perceutage of metal contained in the examined substance. By this method of analysis a correct dctermination of manganese in iron ore can be made in 15 minutes, which is not more than one-third of the time required hy the usual metbods of analysis.

Frozen Dynamite.—Major Majendie, R. A., has made a series of experiments in order to ascertain whether dynamite in the frozen condition was more or less susceptible to explosion by percussion and by the action of fire than dynamite in an unfrozen plastic conditiou. This question is one which had not, so far as he is aware, been carefully investigated or determined, at any rate in this country. He has come to the conclusions that frozen dynamite is considerably less eensitive to explosion by a hlow than unfrozen dynamite; that cartridgee of dynamite having small quantities of exuded nitro-glycerine within them are decidedly more sensitive to explosion hy a blow than cartridges in which there is no such exudation; that frozen dynamite is much more susceptible to explosion by simple ignition than unfrozen dynamite; that frozen dynamite is much less sensitive to explosion by the impact of a bullet than uufrozen dynamite; that the danger attending the mere hreaking in two of a frozen dynamite cartridge does not seem to be of the formidahle character indicated by the Austrian regulations; and that frozen nitro-glycerine is not susceptible of detonation by detonators of the same strength as these with which the detonation of unfrozen nitro-glycerine may be readily and certainly effected. Major Majendie's report has been printed.

A Jew Among the Immortals.—M. Renan, the author of the life of Christ, and of several similar publications, has heen elected a member of the French Academy, and takes his seat among the 40 immortals of that grand assemblage of the scholarship of France. It is a remarkable fact and certainly a magnificent proof of the intellectual trepidity of the French people that, though both of the Napoleons sought the honor, neither of them succeeded in being elected members of the French Academy. The academy was founded by Cardinal Richelieu, who liberally endowed it from his own private fortune, and provided that it should never have more than 40 members, thus heing outside of the State, it has never been swallowed up or modified in any respect by that terrible centralism which in France has engulfed all other institutions in the changes of the last 100 years.—*Day Book.*

Analogy Between Animal and Plant Life. M. van der Harst, in Utrecht, has discovered in the common garden hean, when it hegins to sprout, a ferment analagous to pepsin, which can be extracted hy means of glycerine. It has the power of changing albuminoue into peptonic substances, and starch into glucose. It is found exclusively in the cotyledons. In the case of flesh-eating plants, all the eteps of digestion seem to take place in the eame manner as in animals.

The hypothesis of a one-time igneous fluidity of the earth was combated in a paper lately read before the French Academy hy M. Hermite, entitled "The Unity of Forces in Geology." He would explain the present form of the earth hy the presence and action of its seas, and denies that we are justified in assuming the existence of central fires or even of extensive eeas of lava, from the phenomena of volcanoes. For the paper *in extenso*, eee the *Comptes Rendus* of March 3d.

The Difference.—According to documente which have recently heen puhliehed, the differences of the speed with which electricity travels in overland wires and in suh-marine cahles ie enormous; the speed in a wire euspended in the air heing about 22,400 miles per eecond, and in a aub-marine wire only ahout 2,500 milee.

A Royal Commission on Coal-Mine Accidents.—A commission comprising iu its *personnel* the namee of several eminent scientific men, has just been formed in England, to investigate the following important questions relating to coal mining: The commissioners, we learn from the *English Mechanic*, are appointed "for the purpoec of inquiring and reporting whether, with reepect to the influeuce of fluctuations of atmospheric pressure upon the issue of fire-damp from coal; to the adoption and efficient application of trustworthy indicators of tho presence of fire-damp, aud generally to eystematio nbservation of the air in mines; to improved methods in ventilation and illumination; to the employment of explosive agents in the getting of minorals; and to other particulare relating to mines and mining operations, the resourcce of scicuce furnish any practicablo expedients that are not now in use, and are calculated to prevent tho occurrence of accidents, or limit their disastrous consequencce." The report of this commission will undoubtedly embody a large mass of facts and suggestions wbich will be of the highest value and importance to every class of mine operators.

Electricity and Rain.—Lord Rayleigh has communicated to the London Royal Society, a paper "On the Influence of Electricity on Colliding Water-drops," in which he points nut that he believes that the phenomena in some of the experiments he has made, suggest an explanation of tbe remarkable, "hut hitherto mysterious, connection between rain and elcctrical manifestatione." His experiments were on ordinary slender water jets, and the electricity was in some cases from a rubbed rod of sealing wax, and in othere from a single Grove cell. In the normal state ascending jete resolve themselves into drops, which evcn bcfore passing the summit, and still more after passing it, are scattered through a considerable width. When a feebly electrified body is brought near the jet, the stream is in appearance not broken up into drops—it becomes contiuuous; but with a powerful electric action the scattering becomes even greater than at first. The normal scattering is proved to be due to the rebound of the drops as they come in collision with one another. A number of further experiments with very slight electrical effect are heing tried, and a further communication on them is expccted.

Electrodynamic Induction.—It is a common impression among elcctricians that a telegraphic conducter can be withdrawn from the inductive influence of neighboring conductors by metallic envelopes whicb are connected with the ground, hut H. DeMauex tried some experiments in the month of Februaary, 1878, preparatory to the establishment of the telegraphic service of the French exposition, which led him to the discovery of a new law. In electrostatio action, the induction may be prevented hy the proposed method, hut the law relative to electrodynamic induction is thus stated: In a closed circuit the intensity of the current, which ie determined hy the induction of a cylindrical conducter upon another of the same form, cannot be changed even hy surrounding one or both of those conducters by a concentrio metallic envelope communicating with the ground through its entire length.

Von Oppolzer's Planet.—The tenth orhital confirmation of Chase'e harmonic astronomical prediction, represents the closest planetary proximity to the sun of which any indications have yet been found. There are six interior positions, but they are connected with planetary rotations. Von Oppolzer finde that hie orhit accords very well with the three latest observations, which are the most important because the exact time of observation is known. It alsn satisfactorily represents five other observations. It is impossible to connect it with either of Watson's two planets. Lescarbault's observation being one of the three latest, thie appears to be the true Vulcan, and other names must be found for its companions.—*Comptes Rendus.*

Influence of Color on Warmth of Soil.—By an extensive eeriee of experiments, E. Wollny shows that the color of the surfaco has an important influence on the heating of the ground in a dry condition, where the mineral constituents are substantially the same, and the difference in the quantity of humue is only such as to produce a difference of color, without changing the specific heat or conductivity.—*Dingler's Journal.*

Experiments on Production of Plants.—Prof. H. Hoffman has been for 22 years engaged in experiments on the modification of plants by interference in their external vital conditions. He concludes that the cause of the evolution of new species lies, not, as Darwin believes, in outward influences, hut in internal organic laws, whose nature is at present concealed.

Atmospheric Impurities.—It is estimated that England yearly usee 114,043,940 tons of coal. If we euppoee it to contain only one per cent. of eulphur, there is an annual infusion of 3,500,000 tons of sulphuric acid into the air, which the inhahitants are obliged to hreathe.

The use of chloride of calcium has been eug-geeted hy Prof. Thaler to he driven against the walls of coal mines in form of epray, to fix the duet (it being a deliquescent eubstance), and thus to reduce the liability of dust explosions.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 3.		Week Ending Apr. 10.		Week Ending Apr. 17.		Week Ending Apr. 24.	
Alpha	18¼	17	20	16¾	23½	19½	19¼	18½
Alta	5½	4½	5¼	3¾	5⅝	4.90	5¾	4½
Andes	40c	....	40c	30c	40c	35c	45c	35c
Alps	....	....	....	....	....	....	....	....
Argenta	1	....	1.30	1.05	1.65	1.20	1.80	1.60
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	15c	....
Baltimore Con	1	90c	50c	....	....	....	....	....
Belcher	8⅜	6	6½	5¼	6	5⅝	5⅝	5⅝
Belmont	45c	40c	40c	15c	30c	25c	10c	....
Best & Belcher	16¼	15	16¼	14	17	15⅜	16	15½
Bullion	5½	4.95	5½	4.70	5½	5¼	5¼	4.80
Bechtel	1.90	1½	1.80	1½	1.60	1¼	1¼	90c
Belle Isle	35c	30c	45c	35c	40c	35c	45c	....
Bodie	7	6¼	10	7½	9½	7⅜	9¾	8
Benton	3½	3	3½	3	3½	3	3¾	2.20
Bulwer	16½	15½	21	18	22	19½	22	20
Boyle	....	....	....	....	....	....	....	....
Black Hawk	3½	3.20	4½	3.60	4.70	2.60	2.85	2.05
Belvidere	1¾	1.30	2	1.30	1.80	1¾	1.70	1.40
Booker	70c	50c	75c	50c	70c	55c	55c	45c
Caledonia	2.55	2.10	2½	2.15	2¼	1¾	1.90	1¾
California	5½	4.90	5⅞	5¼	6	5⅜	6¾	6⅜
Challenge	3	2½	2.90	2½	3.20	2.80	2.85	2.80
Chollar	46½	42	6¾	5¼	6½	5⅞	6	5⅞
Confidence	14	11	14½	12	15	14	13⅞	13
Con Imperial	1.35	1.05	1.55	1.20	1.70	1.35	1.45	1.35
Con Virginia	5⅞	4.90	6	4.95	6	5⅜	6½	5⅝
Crown Point	5⅝	4½	5⅝	4½	5¼	4¾	4.95	4¾
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	15c	40c	30c	35c	25c	25c	....
Concordia	25c	....	35c	....	....	....	20c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	5c	....	....	....	20c	10c	....	....
Daney	....	....	....	....	....	....	....	....
Day	30c	25c	30c	25c	45c	30c	60c	45c
Eureka Con	19	15⅞	18	16	17	16	15	14
Exchequer	5	4.80	5	4¾	5⅞	5¼	5⅝	4.80
Endowment	30c	....	25c	....	25c	....	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	6⅞	3.35	3½	3¼	3½	3	3.60	3.05
Gila	....	....	30c	25c	35c	30c	35c	25c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	10	9	9½	....	9	....	9¼	9
Goodshaw	55c	45c	50c	45c	50c	40c	45c	40c
Gould & Curry	6¼	7	7¼	6⅝	8⅞	8¼	8¼	8⅛
Hale & Norcross	11⅞	10¼	10⅞	7¼	12¼	10⅛	11⅛	11
Hillside	1¾	1	2	1¼	2.15	....	2	....
Highbridge	45c	35c	45c	35c	50c	25c	35c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	15c	....	15c	....	20c	15c
Independence	1.60	1½	1.55	1¼	2¾	1.60	3¼	2¼
Julia	4.30	3.80	3.90	3.40	4.10	3½	3.90	3.55
Justice	3.85	3.20	4.70	3.15	4¼	3.60	3.90	3.60
Jackson	7	6	8	7	7¾	7¼	....	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6	4½	5¼	4.60	5	4¾	4¾	4½
Kossuth	10c	....	10c	....	20c	15c	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.15	80c	95c	75c	80c	60c	95c	50c
Lady Wash	1.10	1	1.20	70c	1	85c	1	....
Leopard	1	50c	75c	60c	1½	1.20	1.70	1½
Leviathan	30c	20c	50c	20c	50c	40c	60c	45c
Leeds	60c	....	60c	55c	....	....	50c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	....	25c	....	25c	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	1½	1.10	2½	2¼	2.95	2¼	2.60	2½
Martin White	6½	5½	6⅛	6¼	6½	6	....	....
McClinton	1.30	1.10	1.30	1	1¼	1.10	1.05	90c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	33¾	29	30⅞	29	32½	30	34	31⅞
Mides	....	....	....	....	1	....	....	....
Morning Star	3	....	....	....	2	....	....	....
North Con Virginia	9¼	7⅛	8	7⅞	8¼	8	10	7⅞
New York	80c	60c	70c	55c	70c	60c	65c	55c
Northern Belle	10	9½	10	9⅛	9⅜	8	8¼	7¼
New Coso	....	....	....	....	....	....	....	....
Navajo	25c	....	25c	....	25c	....	....	....
Occidental	....	....	75c	....	....	....	....	....
Ophir	24⅞	20¼	23	20⅞	25½	22¼	27	25
Oriental	60c	55c	60c	55c	55c	30c	40c	....
Overman	11	9½	9⅞	9	9⅞	9⅛	9⅞	6⅛
Panther	....	....	....	....	....	....	....	....
Phenix	2½	2	3¼	1⅞	3	....	....	....
Phil Sheridan	20c	10c	15c	10c	10c	5c	45c	4c
Potosi	....	....	5½	4	4⅛	3.95	3.85	3.70
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5½	5	5¼	4	5½	4¼	5	3.70
Richer	....	....	90c	75c	80c	70c	90c	70c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11¼	9⅜	10¼	9	11	9⅞	10	9⅞
Seg Belcher	....	....	31	20	....	....	....	....
Sierra Nevada	47	41¼	43⅞	40½	43½	41⅞	47	42¼
Silver Hill	1.60	1.35	1¼	1.10	1.30	1.05	1.30	1.15
Silver King	8	7½	7½	7	....	....	8	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	65c	40c	60c	50c	65c	50c	50c	25c
Summit	2¼	2.05	2½	2.10	2.40	2	2.30	2
Scorpion	1⅞	1.40	1.65	1.30	1.60	1.40	2⅞	1.60
Solid Silver	35c	....	35c	....	35c	30c	30c	....
South Bodie	35c	30c	60c	40c	50c	40c	45c	40c
South Standard	30c	20c	30c	15c	25c	20c	20c	15c
Star	60c	60c	50c	40c	....	....	40c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	....	....	....	....	....	....	2	....
Tioga Con	2	1⅜	2	1⅞	2.30	1.95	1.80	1.70
Tiptop	75c	....	75c	70c	75c	50c	75c	60c
Trojan	20c	15c	20c	10c	15c	10c	10c	....
Union Con	60	54½	56½	53	59½	57	69½	58
Utah	15½	13⅞	15	13½	15½	13⅞	14⅞	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.20	95c	1.10	95c	1.15	1.05	1.15	1.05
Wells-Fargo	15c	10c	10c	5c	10c	....	10c	5c
Woodville	15c	....	....	....	....	....	15c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	14⅞	13½	15¼	13	16¼	14⅞	16	15

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 18.
90 Alta....4.85
260 Alpha....18⅞@18½
300 Belcher....5⅞
105 Bullion....6
50 Best & Belcher....15½
100 Benton....3.15
440 California....6½@6⅝
895 Con Imperial..1.40@1.45
25 Crown Point....4.90
20 Confidence....13¼
305 Con Virginia....5⅞@6
295 Chollar....5⅞@6
85 Caledonia....1⅞
160 Challenge....2.80@2.85
570 Exchequer....5½@5
515 Flowery....60@65c
140 Gould & Curry....8¼
140 Hale & Nor....11⅛@11⅜
650 Julia....3.55@3.60
225 Justice....3.70@3.65
100 Kossuth....10c
50 Kentuck....4¾
200 Leviathan....55c
250 Lady Bryan....50@60c
230 Mackey....2½
35 North Con Vir....8
1020 N Bonanza....1.40
100 New York....55c
565 Ophir....25¼@25
20 Overman....8½
140 Potosi....3⅞
700 Phil Sheridan....5c
430 Solid Silver....30c
725 Scorpion....1.60@1.65
100 Succor....45c
45 Sierra Nevada....42¼
15 Savage....10
1130 Silver Hill....1.15@1¼
20 Union Con....58
40 Utah....13⅞@14
135 Ward....1.05@1.15
100 Woodville....15c
635 Yellow Jacket....15¼@15⅜
AFTERNOON SESSION.
600 Argenta....1⅞
700 Albion....25c
240 Bulwer....20@20¼
150 Belle Isle....45c
165 Bodie....8¼@8½
590 Black Hawk....2.55@2¼
150 Belvidere....1.70@1.60
695 Bechtel....1½@1.20
375 Booker....55@45c
205 C Pacific....2.40@2.30
300 Caledonia (B H)....2
500 Day....45@50c
200 Dudley....40@45c
600 Fourth July....30c
150 Gila....30@25c
105 Grand Prize...3.05@3.15
100 Goodshaw....45c
100 Golden Terra....9
150 Hillside....2
1200 Highbridge....30@35c
200 Ida....25c
545 Independence...2½@2.60
840 Jupiter....70@65c
100 Leopard....1¼
225 Manhattan....2.60
100 McClinton....1.05
270 Mono....2.90
40 Northern Belle....8¼
1150 Noonday....2¼@2
100 N Noonday....1.15
50 Oriental....40c
40 Raymond & Ely....4⅝
35 Real del Monte....4@4½
100 Star....40c
400 Summit....2.20@2.30
150 S Bodie....40c
500 S Standard....20c
140 S Bulwer....80@75c
490 Tioga Con....1⅞
300 University....50c

Saturday A.M., Apr. 19.
60 Alta....4½@4.80
120 Andes....35@40c
1250 Argenta....1.80@1.70
50 Alpha....18½
180 Best & Belcher....15⅛
280 Bullion....4.85@4.80
50 Benton....2.20
50 Belle Isle....45c
250 Belvidere....1.60@1½
545 Bodie....8½@8
1000 Bechtel....1.20@1.10
450 Booker....55@50c
365 Black Hawk...2.05@2.10
30 Bulwer....20½
580 California....6⅜
1295 Con Virginia....6@5⅞
825 Con Imperial..1.35@1.40
30 Crown Point....4.80
30 Confidence....13
300 Caledonia....1.80@1.85
200 Concordia....20c
20 C Pacific....2.40
100 Champion....25c
500 Day....50c
490 Exchequer....4.80@5⅛
460 Eureka Con....15@14⅞
350 Flowery....60@65c
900 Fourth July....40c
400 Grand Prize....3½@3.30
200 Gould & Curry....8⅜
300 Gila....30c
50 Goodshaw....40c
80 Golden Terra....9
200 H & Norcross....11¼
100 Hussey....20c
550 Highbridge....30@35c
100 Hamburg....50c
1141 Independence..2.70@2.90
100 Ida....25c
120 Justice....3.65@3.60
235 Julia....3⅞@3.80
500 Jupiter....65@60c
450 L Bryan....50@60c
485 Leopard....1½
300 Leviathan....50@45c
315 Mexican....31⅞@32
50 Mt View....4½
150 Mackey....1.95@1.90
20 Manhattan....2½
50 May Belle....25c
450 McClinton....1@90c
200 Mono....2.80@2⅞
100 New York....60c
550 N Bonanza....1¼
35 Northern Belle....8½@8¼
55 N Con Virginia....7⅞
550 Noonday....2¼@2½
475 N Noonday....1.15@1.05
625 Ophir....25½@25⅞
10 Overman....9
100 Potosi....3⅞
400 Phil Sheridan....4c
275 Paradise....1.40@1½
90 Raymond & E....5
100 Red Cloud....90c
30 Savage....10
115 Sierra Nevada....43
160 Succor....40c
100 Silver Hill....1.20
155 Scorpion....1.65
500 Solid Silver....30c
300 S Standard....15@20c
245 S Bulwer....70c
100 South Bodie....40c
320 Tioga....1⅞@1.80
1050 Trojan....10c
100 Tiptop....70c
20 Utah....13⅞
160 Union Con....59½@59¼
203 Ward....1.05@1.10
1000 Wells-Fargo....5c
415 Yellow Jacket....15@15⅜

Monday A. M., Apr. 21.
50 Alpha....18⅜
440 Alta....4.95@5
385 Bullion....6
215 Best & Belcher....15⅞@16
320 Belcher....5⅜@5⅞
630 California....6⅜@6½
1070 Con Virginia....5⅞
80 Chollar....5⅝
50 Challenge....2.85
290 Caledonia....1⅞
1730 Con Imperial....1.40
170 Crown Point...4.90@4.95
200 Exchequer....5@5⅛
100 Flowery....60c
220 Gould & Curry....8¼
110 Hale & Nor....11⅜@11⅞
300 Julia....3.85@3.80
80 Justice....3.80
100 Lady Bryan....65c
80 Leviathan....50c
150 Mackey....1.80
100 Mountain View....4¼
80 Mexican....31⅞@32
140 N Bonanza....1.30@1.35
60 North Con Vir....9¼
100 New York....60c
505 Ophir....25½@26
180 Overman....9
500 Phil Sheridan....5c
270 Silver Hill....1¼
200 Solid Silver....30c
70 Scorpion....1.70
350 Sierra Nevada....44⅞@46
200 Succor....50c
350 Union Con....63½@65
140 Utah....13⅞@13⅞
5550 Wells-Fargo....5c
210 Ward....1.10
250 Yellow Jacket...15¼@15⅛
AFTERNOON SESSION.
280 Argenta....1⅞@1.80
500 Albion....30c
550 Booker....55@50c
225 Belvidere....1½@1.40
350 Black Hawk....2.80@2⅞
60 Bulwer....21
80 Bodie....8@8½
1205 Bechtel....1.10@1
675 Crown Point....2¾@2.05
200 Champion....25c
550 Day....60c
200 Dudley....45c
30 Eureka Con....14¼@14½
500 Fourth July....40c
110 Golden Terra....9½
100 Grand Prize....3.40
300 Highbridge....30@35c
200 Hillside....2
100 Hussey....20c
835 Independence....2.95@3
810 Jupiter....40@50c
200 Leopard....1.55
350 Mono....3@3.05
250 McClinton....90@95c
624 Noonday....2½@2
35 Northern Belle....8¼
300 N Noonday....1
200 Paradise....1.40
100 Richer....90c
50 Raymond & Ely....4½
100 Red Cloud....75c
400 Summit....2¼
300 S Standard....15@20c
200 S Bulwer....65@70c
350 S Bodie....40@45c
100 Silver King....8
250 Tioga Con....1.80@1⅞
100 Tiptop....70c
150 University....55c

Tuesday A. M., Apr. 22.
1140 Alta....5⅞@5½
70 Alpha....19⅛
380 Andes....40c
65 Belcher....5⅞
140 Best & Belcher....15¼
650 Bullion....5
490 Benton....3⅞@3.7
60 California....6¼
110 Con Imperial....1.4
525 Crown Point...4.95@4.9
310 Con Virginia....5⅞
200 Challenge....2.80
130 Caledonia....1⅞@1.80
70 Confidence....13⅞@13½
30 Chollar....5⅞
225 Exchequer....5⅜
300 Flowery....70@65c
100 Gould & Curry....8⅜
435 H & Norcross....11⅛@11
110 Julia....3.80
230 Justice....3.80@3⅞
1380 L Bryan....85@95c
350 Leviathan....50@55c
100 Mt View....4⅜
585 Mexican....33@33⅜
1120 New York....60@65c
240 N Bonanza....1.30@1.40
595 North Con Vir....9⅞@9
750 Ophir....26½@26
60 Overman....9½
60 Potosi....3.70
1300 Phil Sheridan....5c
50 Savage....10
320 Silver Hill....1.20@1.30
100 Succor....45c
310 Scorpion....1.70@1.80
100 Solid Silver....30c
445 Sierra Nevada....47@46¼
1350 Trojan....10c
225 Utah....14⅞@14
435 Union Con....69@68
4350 Wells-Fargo....5c
380 Ward....1.10
250 Yellow Jacket....15½
AFTERNOON SESSION.
320 Argenta....1.65
100 Aurora T....15c
200 Albion....30c
330 Bodie....9⅞@9½
915 Sechtel....90@95c
240 Belvidere....1.40
140 Bulwer....20½@20¼
100 Benton....40c
195 Black Hawk....2½@2.85
10 Booker....50c
440 C Pacific....2
350 Dudley....45c
600 Day....60@55c
10 Eureka Con....14
30 Golden Terra....9
500 Goodshaw....40c
3.0 Grand Prize....3.60@3½
400 Gila....35@30c
300 Hussey....20@15c
20 Hamburg....50c
1250 Highbridge....30@25c
50 Hillside....2
1060 Independence....3@3¼
850 Jupiter....45c
735 Leopard....1.70@1.60
370 Mono....3@2.90
770 McClinton....95c@1
60 Manhattan....2.60
35 Northern Belle....7¼
435 Noonday....2@2.10
80 N Noonday....1
450 Paradise....1½
25 Real del Monte....4
50 Richer....70c
350 Raymond & Ely....4½@4¼
15 Silver King....8
400 S Bulwer....70@75c
50 South Standard....20c
100 Syndicate....2
675 Summit....2.10@2
300 S Bodie....40@45c
145 Tiptop....65c
500 Tioga....1⅞
1000 University....45c

Wed'sday A.M., Apr. 23.
75 Alpha....19⅛@19¼
450 Alta....5⅞@5½
220 Benton....3.65@3⅞
510 Bullion....5
130 Belcher....5⅞@5⅝
50 B & Belcher....16
1840 California....6½
60 Confidence....13⅞
340 Challenge....2.80
15 Caledonia....1.90@1.85
20 Chollar....5⅞
1705 Con Virginia....6@6⅛
1235 Con Imperial....1.35
825 Exchequer....5¼@5⅜
200 Flowery....60c
125 Gould & Curry....8⅜@8½
270 Hale & Nor....11⅛@11¼
370 Julia....3.85
440 Justice....3.90@3.85
10 Kentuck....4½
340 Leviathan....50@45c
100 Lady Wash....1
625 Lady Bryan....80@70c
255 Mackey....1½
100 Mount View....5⅛@5
390 Mexican....32¼
205 N Bonanza....1.40@1½
200 New York....65c
120 North Con Vir....9⅞@9
465 Ophir....26@26¼
80 Overman....9½@9⅞
20 Potosi....3.85
150 Phil Sheridan....5c
800 Solid Silver....30c
320 Silver Hill....1.20@1.15
280 Scorpion....2.35
150 Succor....45c
15 Savage....10
415 S Nevada....46@45
600 Trojan....10c
50 Utah....14½@14
150 Union....66@67
100 Ward....1.05
180 Yellow Jacket....15½@15⅞
AFTERNOON SESSION.
200 Aurora T....15c
650 Albion....80@90c
1430 Argenta....1.70@@1.60
1275 Bodie....9@8⅞
210 Bechtel....90c@1
35 Bulwer....22@21⅞
525 Booker....50@55c
700 Black Hawk....2⅞@2.55
300 Belmont....10c
365 Belvidere....1½
100 Concordia....20c
310 Crown Point....1.95@2
750 Champion....25c
100 Caledonia (B H)....2.10
300 Day....55c
50 Dudley....45c
1000 D Standard....75c
500 Endowment....25c
170 Eureka Con....14¼@14½
500 Fourth July....35c
70 Golden Terra....9
35 Grand Prize....3½
850 Gila....35c
700 Goodshaw....45@40c
100 Hamburg....50c
200 Hillside....2
1860 Independence....2.90@3
1350 Jupiter....55@60c
50 Leeds....50c
500 Leopard....1.60@1.65
1330 Mono....2.95@3.15
375 McClinton....1
100 Manhattan....2.60
280 Northern Belle....7¼
1010 Noonday....1.90@1⅞
200 N Noonday....1@90c
250 Paradiso....1½
25 Real del Monte....4
50 Richer....75c
250 Raymond & Ely.3⅞@3.70
70 Red Cloud....75c
330 Summit....2@2.10
450 S Bodie....40c
15 Silver King....8
130 S Bulwer....70@75c
880 Tiptop....60@75c
140 Tioga Con....1⅞@1.70
800 University....45c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Apr. 17.
150 Alta....5@4.90
100 Andes....40c
5 Best & Belcher....16
280 Belcher....5⅞
145 Bullion....5¼@5½
180 Chollar....5⅞@5⅞
1410 Con Virginia....5½
2220 Con Imperial....1.40
150 Crown Point....5@4.95
100 Confidence....14
1235 California....6
150 Challenge....2.60
225 Caledonia....1.80@1⅞
620 Exchequer....5⅜
55 Gould & Curry....8⅞@8¼
70 Hale & Nor....11⅞@11⅞
520 Justice....3.90@3.60
510 Julia....3.65@3.50
1220 L Bryan....70c
15 Lady Wash....1
100 Leviathan....45c
170 Mexican....31½@31
65 Mt View....4⅞
205 New York....60c
420 Ophir....24⅞@24½
130 Overman....9¼
150 Phil Sheridan....5c
80 Sierra Nevada....42@41⅞
175 Savage....10@9⅞
350 Succor....55c
200 Silver Hill....1.05
45 Utah....13⅞
30 Union Con....58@57½
910 Wells-Fargo....10c
170 Ward....1.10@1.05
165 Yellow Jacket....15⅞@15¼
AFTERNOON SESSION.
1030 Argenta....1¾@1.80
400 Belle Isle....40c
140 Bulwer....20
560 Bechtel....1¼@1.35
330 Bodie....7⅞@8
600 Booker....60@65c
700 Belvidere....1⅞
100 Caledonia (B H)....2.20
200 Champion....20c
165 C Pacific....2¼@2.45
200 DeFrees....5c
550 Day....45@50c
300 Dudley....45c
235 Eureka Con....15⅛@16
100 Hussey....20c
1450 Highbridge....30c
200 Hillside....2.10
1080 Independence.2.30@2.40
110 Jackson....7
576 Jupiter....70@75c
150 Leopard....1¼@1½
100 Manhattan....2⅞@2.80
425 McClinton....1¼@1.10
210 Mono....2.90
25 May Belle....25c
50 Northern Belle....8½
80 Navajo....15@20c
450 N Noonday....1½
150 Noonday....2¼@2.35
100 Oriental....50c
80 Paradise....1.40@1.45
150 Red Cloud....75c
550 S Bulwer....85@80c
300 Summit....2.10@2.20
50 Syndicate....2
200 South Standard....20c
970 S Bodie....40@45c
510 Tioga Con....1.70
400 University....50c

Thursd'y A. M., Apr. 24.
25 Alpha....19¼
240 Alta....5⅞@5⅞
700 Andes....40@45c
115 Best & Belcher....15⅞@16
280 Bullion....5¼@5¼
160 Belcher....6⅛
480 Benton....4
50 Chollar....5⅜
1885 Con Virginia....6⅛
200 Crown Point....4⅞
215 California....6⅞
350 Con Imperial..1.35@1.40
95 Confidence....14¼@14
210 Challenge....2.80@2.85
250 Exchequer....5¼@5⅞
800 Flowery....65c
120 Gould & Curry....8¼@8⅞
100 Hale & Nor....11¼@11½
560 Justice....3.70@3.65
235 Julia....3.90@3.85
10 Lady Bryan....70c
200 Lady Wash....1
475 Leviathan....50@60c
30 Mexican....34@34¼
135 Mackey....1½@1.60
500 Margarita....15c
150 Mountain View....5¼@5½
45 North Con Vir....10
650 New York....60@65c
910 N Bonanza....1.30@1.40
400 Ophir....26⅞@27
190 Overman....9⅞
70 Potosi....3.80
35 Phil Sheridan....45c
160 Sierra Nevada....46½@46
200 Succor....25c
255 Silver Hill....1.20@1¼
90 Savage....9⅞@10
700 Solid Silver....30c
995 Scorpion....2½@2⅞
280 Trojan....10c
130 Utah....14½
230 Union Con....69@69½
100 Ward....1.05
100 Wells-Fargo....10c
155 Yellow Jacket....15⅞@16
AFTERNOON SESSION.
630 Argenta....1.40@1½
495 Aurora T....15@20c
380 Albion....50c
80 Bodie....8
40 Bulwer....21⅞
200 Booker....50@55c
470 Belvidere....1.40@1½
335 Black Hawk...2.60@2.70
700 Belle Isle....35@40c
600 Belmont....10@30c
445 Bechtel....90@9[illegible]c
400 Caledonia (BH).2.10@2.20
100 C Pacific....2.10@2
30 Champion....25c
100 DeFrees....10c
575 Day....60@55c
350 Dudley....40c
90 Eureka Con....15
300 Goodshaw....30c
330 Grand Prize....3½
300 Gila....3[illegible]c
50 Highbridge....35c
600 Hamburg....50c
150 Hillside....2
375 Independence....2⅞@2.80
50 Jackson....6⅞@6⅞
3350 Jupiter....60@65c
350 Leopard....1½@1.60
20 Martin White....5⅞
220 Mono....3.10@3.05
300 May Belle....25c
520 McClinton....1@95c
125 Manhattan....2½@2.55
310 Northern Belle....7
1100 Navajo....20c
500 Noonday....1.90
100 N Noonday....80c
50 Paradise....1½
200 Richer....70@75c
320 Raymond & Ely..3⅞@3.90
225 Revenue....1
1000 S Bulwer....75@70c
100 S Standard....20c
570 S Bodie....40@35c
30 Silver King....8
80 Summit....2.20
1100 Tuscarora....5c
110 Tioga Con....1.70@1⅞
100 Tiptop....80c
300 University....40c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 9	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 7	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leviathan M Co	Nevada	8	25	Mar 6	Apr 12	May 2	F E Luty	507 Montgomery st
Leopard M Co	Nevada	10	50	Mar 10	Apr 14	May 5	R H Brown	327 Pine st
Manhattan S M Co	Nevada	2	1 00	Mar 3	Apr 8	Apr 30	Jno Crockett	203 Bush st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	May 5	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 15	H A Whiting	211 Sansome st
Mono G M Co	California	3	60	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Aurora T & M Co	California	3	20	Feb 24	April 1	Apr 30	C Van Dyck Hubbard	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Butte H M Co	California	2	25	Apr 16	May 17	June 17	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Con Dorsdo M Co	Nevada	1	50	Mar 10	Apr 12	Apr 30	J M Buffington	309 California st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgom·ry st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 16	O H Bogart	106 Leidesdorff st
Godfrey Gravel M Co	California	4	05	Jan 17	Feb 20	Apr 28	J M Buffington	309 California st
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	316 Pine st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Pinal M & M Co	Arizona	1	6 00	Feb 19	Apr 5	May 5	Amos Roberts	214 Sansome st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Summit M Co	California	7	05	Feb 4	Mar 11	May 6	R N Van Brunt	318 Pine st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	50	Apr 19	May 26	June 12	H Aug Whiting	211 Sansome st
Sophia G M Co	California	1	02½	Apr 23	May 26	June 13	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st
University G M Co	California	1	10	Mar 1	Apr 6	Apr 26	Wm Letts Oliver	328 Montgm'y st
Wide Awake Prospecting & M Co	Ariz	6	04	Feb 1	April 1	May 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Endowment M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 5
Golden Gate Con H M Co	California	Jno T Geoghehan	318 Pine st	Special	May 9
Golden Star M Co		J W Morgan	318 Pine st	Annual	April 26
Justice M Co	Nevada	R E Kelley	419 California st	Annual	May 5
Justice Con M Co	Nevada	R E Kelley	419 California st	Annual	May 5
Morgan M Co	California	J J Raphael	633 Kearny st	Annual	May 3
Morning Star M Co	Nevada	Jas B Maholm	331 Montgomery st	Annual	April 29
Richer M Co	California	Wm H Lent	309 Montgomery st	Annual	Apr 29
San Francisco Copper M Co	California	P Sanchez	258 Market st	Annual	May 5
Tiger M Co	Arizona	Wm H Lent	309 Montgomery st	Annual	May 6
Woodville Con S M Co	Nevada	R E Kelley	419 California st	Annual	May 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Bodie G M Co	California	W H Lent	327 Pine st	1 00	Jan 20
California M Co	Nevada	C P Gordon	23 Nevada Block	1 00	Jan 16
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	April 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	Apr 21
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

Pacific Board—Latest Sales.

Wed'sday A.M., Apr. 23.
60 Alpha....19½
60 Belcher....5⅞
120 Best & Belcher....15⅞@16
150 Benton....5@4.95
190 California....6.60
90 Chollar....5⅛
500 Con Imperial....1⅜
170 Con Virginia....6¼@6.20
60 Crown Point....4.85
30 Gould & Curry....8⅛
10 Hale & Nor....11¼
30 Kentuck....4.80
150 Mexican....33¾@33½
160 Ophir....26¼@26⅜
100 Potosi....3.85
300 Savage....10
30 Sierra Nevada...45⅞@45½
50 Yellow Jacket....15⅝
AFTERNOON SESSION.
180 Alta....5⅞@5½
60 Andes....35c
50 Argenta....1.65
345 Benton....3.85@3.95
50 Bodie....9½@8⅞
360 Boston....2.45@2¼
190 California....6.55
50 Con Virginia....6⅜
[illegible]0 Crown Point....4.90
100 Exchequer....5⅜
20 Gould & Curry....8¼
30 Hale & Nor....11¼
40 Justice....3.90
100 Mackey....1⅜
100 Mexican....33⅜@33⅞
130 New York....65c
50 Ophir....26¼
110 Savage....10
30 Scorpion....2.70
50 Silver Hill....1.20
200 S Bodie....40c
500 S Utah....4c

California Board—Latest Sales.

Wed'sday A.M., Apr. 23.
500 Ætna....7c
120 Andes....40@42½c
20 Alta....5¼@5.30
50 Alpha....19@19¼
90 Belcher....5.70@5⅞
120 Boston....2½@2.60
30 Best & Belcher....1[illegible]
70 Bullion....4.90@4.95
50 California....6⅞@6¼
60 Con Virginia....6@6⅛
200 Con Imperial....1⅜@1.40
110 Crown Point...4.95@4.85
80 Chollar....5.70@5.80
120 Crevice....10c
50 Challenge....2.80@2.85
50 Caledonia....1.80@1.85
50 Exchequer....5¼@5.20
250 Favorite....30c
30 Gould & Curry....8⅞@8¼
110 Goodshaw....40c
20 Hale & Nor....10⅞
60 Julia....3.80@3.95
120 Justice....3.70
30 Mexican....33@33½
100 N Sierra Nevada....1c
70 Ophir....25⅞@25¼
200 Phil Sheridan....5c
70 Potosi....3.70@3⅞
30 Savage....9⅞
100 S Utah....1c
50 Sierra Nevada...45⅞@46⅞
100 Silver Hill....1.22½
50 Silver Jacket....60c
90 Union....66½@66¼
2000 U Flag....4c
100 Wm Penn....20c
200 Wells-Fargo....8c
50 Yellow Jacket..15¼@15⅜
AFTERNOON SESSION.
300 Ætna....4c
1400 Atlanta....1@2c
2500 Almaden Q....25c
700 Alexander....5@3½
200 Andes....40c
50 Alpha....19⅛@19⅞
60 Alta....5½@5⅞
50 Belcher....5⅞@5.70
50 Best & Belcher....16@16½
100 Bullion....5@5¼
65 California....6⅞@6⅞
50 Con Virginia....6⅞@6⅛
300 Con Imperial....1.35@1⅜
500 Coso Con....5c
60 Crown Point...4.75@4.70
50 Chollar....6⅜@5⅞
100 Enterprise....1
50 Exchequer....5⅛@5⅞
[illegible]0 Gould & Curry....8⅛@8⅜
100 Golden Chariot....35c
200 G Deposit....35c
50 Hale & Nor....11⅛@11⅛

40 Julia	3¾@3.70	50 Silver Hill	1.24
40 Mexican	33½@33½	100 S Bodie	40c
100 Newark	25c	50 Tiger	1.40
50 Ophir	26½@26½	150 Union Con	68@68½
40 Potosi	3.70@3½	100 Wales	1½@1
40 Savage	10@10½	100 Wells-Fargo	6c
50 Sierra Nevada	47@47½	50 Yellow Jacket	15½@15½

Mining Share Market.

There has been little or nothing of interest in the share market during the past week. The same listlessness and inactivity still prevails, and it is doubtful whether a lighter aggregate of sales has characterized any other period during the year. The uncertainty concerning the new Constitution has had the worst possible effect on both operators and market, preventing them from doing either one thing or the other until its rejection or acceptance is decided. This gives the market a freedom from fluctuation or excitement which many construe into a "hopeful firmness." The general talk predicts an immediate rise after election, and it is to be hoped that such will be the case. The only event worthy of notice during the week was the wholly unaccountable spurt in the Comstocks on Monday. There was a sharper rise in Union Con., Sierra Nevada, Mexican and other north end stocks than has been seen for a month past. No definite reason can be assigned for the movement, and, in fact, it was only temporary, the prices falling again on Tuesday to their old level, from which they did not recover during the week.

Shasta County Notes.

April 19th, during our recent visit to the north, we gleaned the following notes from individuals in Shasta City, the county seat of Shasta county:

At Frank Litsch's store is to be seen a white quartz boulder, containing a large quantity of free gold, estimated to contain 39 ounces, valued at $700 dollars. It was found about three weeks ago in the placer claims of Gabriel Salort, on Flat creek, some 7 miles north of town.

At Wiser's, two miles below Shasta, several lodes are being prospected by Alvan Potter, a well-known miner of this region. He is down over 40 feet on the Wiser ledge. This and the old Spanish are showing good promise. We saw some very rich rock carrying visible free gold. Several new mining homes enlivens the wayside at this locality.

Near French Gulch, on the road to the Washington company, we pass the Highland claims, where Judge W. E. Hopping, after years of perseverence, has found his rich ledge again, in good and solid width, from which we expect to hear further decidedly good results.

On Washington hill, at French Gulch, the Washington company will resume mill operations next month. The Niagara has 200 tons of good looking ore out already, and are putting up an arastra for immediate work.

Kern and Shea are busy with their arastra on good rock. They have already enough out to last them over two years. They are well satisfied with their prospects. Mr. Willey has returned from the East and commenced work with new vim, together with his partner, Mr. Phillip. On the other side of the Gulch, the old Franklin is worked by Simon Sutter. It promises to become an excellent paying mine again. Further down, the Churchill company is working placer claims successfully, we understand. Several other claims are working thereabouts of which we have no report.

Several quartz claims at Whiskytown are paying very well. Grotefend & Co. have their mill completed on the old Peckham claim; will commence crushing next week on very fine ore. The Warfield & Co.'s claim (first extension south of the Peckham) are working an arastra with satisfactory results, of which we shall doubtless hear further hereafter.

On Dog creek, 30 miles north of Shasta, near the stage route to Yreka, there are several first-rate quartz claims. Smith & Co. are developing a ledge with indications, so far as prospected, of one of the best paying in the State.

The arastras (in many instances at least) in this county have fallen into good, practical hands, and are made to "pay as they go" in thoroughly testing the ledges before the erection of costly mills. Many capital-waiting prospectors elsewhere should make a note of this and follow suit for their own and the public good.

The quartz business, still looming up in Shasta county, seems destined to progress extensively for years to come. The increasing shipment of bullion is already telling a good story for this county.

Green & Halsey, of the Spring Creek Hydraulic Co., on Salt Pork ridge three miles east of Shasta, have a good supply of water and are now piping in full force. They are hopeful over the prospects of the season's work, and will not clean up until some time in June. A good report is then confidently looked for by those best posted.

On Thursday of last week we visited Nelson Waite and James Howe (partners with J. R. Jones), at Texas Springs, situated three miles up Clear creek from Bell's bridge and railroad crossing on the Reading ranch. They own the Clear Creek ditch, extending 50 miles from the Tower house to Texas Springs. Here 450 acres of patented land comprises part of their mining ground. They lately purchased 2,000 feet of iron pipe—11 and 13-inch—made by Francis Smith, S. F., which they are just now laying for working an old river channel considered very rich. They reckon the channel will average 100 feet or more wide by some 2,000 feet long. With two giant pipes and the improvements they are now putting in, the prospects seem to be that a rich and continuous harvest is close at their hands. The ditch supplies water the year round. Claims in this vicinity have yielded large sums of money in the old "hand to mouth" way of working. These hard workingmen have persevered to an extent worthy of all the success they seem destined to soon realize. Since 1849 Mr. Waite has mined in this section, and for a term of years in partnership with Mr. Howe. We may here mention that Messrs. Howe and Waite have applied for a patent on a new system of movable sluices calculated to work off flats having so limited a fall that they cannot otherwise be practicably worked. Their device is simple and can also be made serviceable in reclaiming ground for agricultural purposes.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Amador Gravel.—*Ledger*, April 19: The claim comprises over 200 acres. A small gulch, coming in from the north, cuts the claim near the center. On either side the ground slopes up gently to an elevation of about 150 ft. Both banks are auriferous, but the eastern slope has so far monopolized the attention of the company. The manager has confined his attention up to the present time to opening up the mine for hydraulicing on a large scale. An open cut extends from the bed of the ravine into the hill a distance of 264 ft. This cut is in places 40 ft deep, and is intended for the reception of the flume. At the end of the cut, a well-defined gravel bed, 30 ft in thickness, is seen—evidently a river channel, or other large water way. The gravel is rather coarse, the boulders being smoothed and rounded, unmistakably showing the agency of water. A large proportion of the gravel is composed of quartz. The entire bank would wash freely, as very little pipe-clay or cement is met with. At the face of the cut, the gravel dips visibly. Supposing the gravel to hold its present level, when the crest of the hill is reached the pay dirt will be 100 ft in thickness. Different parts of the hill have been tested, and found to prospect well, and the outlook for an extensive and profitable hydraulic claim is flattering. Nine hundred ft of flume, three ft wide and two ft deep, is being constructed as rapidly as possible, and the work of putting it in position will soon commence. There is a branch ditch, three and a half miles long, connecting with the Amador canal. The ditch at present will carry 800 inches, but it is to be enlarged to a capacity of 1,000 inches. Inside of a month, it is expected to have everything in readiness to open upon the bank with from 800 to 1,000 inches of water. The claim at present gives employment to 10 men. All the appliances and conveniences necessary to mine on a scale in keeping with the vastness of the claim, are on the ground. There is a blacksmith's and carpenter shop, both fully equipped. Also, a commodious boarding house in course of erection.

Millo Mine.—The Millo Bros. have built a five-stamp mill at Middle Bar, to operate a quartz claim in that neighborhood. They have been busily engaged for months past in fitting up the mill, and it is now in first-class working order. The owners expect the rock they have on the dump to yield $20 per ton, and there is plenty more of the same quality in sight in the mine.

Miscellaneous.—F. H. Thoms & Co. have commenced sinking a shaft on a quartz ledge, three miles north of Plymouth, on the place of H. C. Davis. It is an old claim formerly worked by Jeese Morris, deceased. Joseph Burgas, "French Joe," in his claim about half a mile from Clinton, had the good fortune to pick up a $38 nugget, a day or two since. S. G. Spagnoli, in his hydraulic claim, frequently finds nuggets between clean-ups varying in value from $6 to $10.

CALAVERAS.

New Mill.—*Chronicle*, April 19: Active operations are in progress at the Mount Tmolus mine, Jesus Maria district. A new 10-stamp mill is being erected, and a large number of men are engaged in developing the mine. Levels are being run, stopes opened and everything got in shape for taking out ore rapidly when the mill is ready for crushing. Twenty-seven men are employed about the mill and mine, and a larger force will be put on as soon as taking out ore and milling is commenced. The Mount Tmolus is pretty well developed and known to be a good mine.

EL DORADO.

Kelsey Items.—Cor. Placerville *Democrat*, April 10: A crushing of rock taken from the croppings for a distance of 000 ft along the Estrella ledge, gave a return of $7 per ton. The rock crushed was the poorest that could be chosen, and was selected for the purpose of determining whether there was any barren rock in this lode or not. The tunnel of the Esperanza is now in to the lode, and the work of crosscutting the ore is going on rapidly; they have now driven into the ore body 12 ft and the ore is still solid in front, and good prospects are got with mortar and pan. Owing to the bad weather and other difficulties the work of clearing the Rosecranz of water is progressing slowly.

FRESNO.

Oro Fino.—Cor. *Republican*, April 12: The mill of the Fresno gold mining company has been running since the 18th of March, night and day, Sundays excepted, crushing in that time 00 tons of ore from the company's mines. On the 9th the mill was shut down and a very satisfactory clean-up made. The 60 tons of ore worked yielded 164 ounces of bullion worth $14 per ounce. The mines are showing splendidly, and new ground is being cut daily with the most flattering prospects. The mine and everything connected therewith is being worked and carried on, strictly on business principles and with the greatest economy. The mill will be started up again in a few days. Preparations are being made to commence work at Quartz mountain. The ledge of quartz is immense, averaging four ft in thickness, and the hanging wall, by some agency of nature, has entirely disappeared, leaving about 20 acres of the ledge exposed, so that there is nothing to do but to quarry it out and it is ready for milling. The owner of this immense ledge will commence the erection of a mill of large capacity immediately. The ore has been tested and will yield about $12 per ton. At the old Harbert mine, nine tons of ore were worked in an arastra which yielded over $65 per ton. There is an old 10-stamp mill on the property, and the ledge averages five ft in thickness, with a rich streak of 14 inches next the hanging wall, the quartz all carrying gold in paying quantity. The mine has been closed for seven years owing to financial embarrassment caused by bad management, which it is stated has been overcome, and work will shortly be resumed.

INYO.

Darwin Mines.—*Independent*, April 19: Mr. Wm. Ross, of Lookout, is reported to have discovered a very encouraging gold-quartz prospect, which is looking remarkably well, and he is shipping ore to San Francisco. It is located in Snow's canyon. They will soon start up again the five-stamp mill at Snow's canyon for a month's run or more. The New Coso mining company's furnace will start up shortly for a three or four weeks' run, and besides its own ores will smelt those from the following companies and mines: The Custer mine is still shipping ore, and already has over 100 tons at the furnace. The Modock mining company is now engaged in shipping 50 tons; the Minnietta Belle Co., by Beaudry & Belshaw, will send over about 60 tons; the San Ygnacio mine, owned by Rothschild & Greenly, has now on the way some seven tons, and it is expected that from 10 to 15 tons will be received from the Hindoo mine, the property of Messrs. Childs, Armstrong & Wallace. If the results are considered favorable after being sampled and assayed, the Modock Co. will probably send all their smelting ores over, as also the Custer, and no doubt the balance. The New Coso Co., through their superintendent, Mr. J. J. Williams, are offering favorable inducements to all parties having ore in limited quantities to have the same worked cheap.

MONO.

Standard.—*Standard*, April 21: The south drift from the main shaft, 385 level, is in 305 ft; progress during the week, 31 ft. The ledge is two ft wide, and looks well. The east crosscut from this drift, 300 ft south of shaft, is in 30 ft in very favorable ground. The north drift to connect with incline has been run 17 ft. The ledge is four ft wide of very good ore. An upraise has been started on this ledge 100 ft north of the main crosscut. This upraise shows a ledge four ft wide of very fine ore. The east crosscut, 700 level, is in 34 ft. The rock is very hard. The west crosscut, same level, is in 37 ft. The West Standard winze is down 60 ft. The ledge in the bottom is 18 inches wide of very rich ore. The south drift on the Gilden ledge is in 107 ft. The ledge is two ft wide and looks well. A new wire rope for the incline shaft has been received.

Bulwer.—The south drift, 380 level, has been advanced during the week 12 ft; total length, 262 ft. The ledge is two and one-half ft wide, and looks well. The west crosscut from this drift is in 100 ft. The rock in the face is still hard. Drifts north and south have been started on the last ledge cut in this crosscut at 50 ft west of the main south drift. The ledge is four ft wide of good ore. The south drift, 280 level, is in 80 ft; progress since last report, 13 ft. The ledge is here three ft wide, of good ore. Extracting ore and shipping to the Bodie mill has been resumed.

The Blackhawk.—The Warren ledge has been cut on the 320 level in west crosscut, about 90 ft from the shaft. The size and looks of the ledge are not unlike the showing on the 220; the fissure is widest south, or about three ft, and two and a half north, with very rich stratum on hanging wall of several inches thick, remainder of filling of lower grade. But little drifting has been done. The crosscut is still going ahead, as is that on the 220 level. Crosscutting is proceeding from the 320 level directly east from the shaft, in favorable formation.

Tioga.—The crosscut west from the main shaft, 520 level, is the most interesting feature of the mine. It will be pushed rapidly. The formation is very favorable. The crosscuts on 420 and 320 levels are going ahead as usual. It is probable that orders will come for pushing a lateral drift north from the 520 level to connect with the Syndicate main tunnel, and pushing things generally.

Con. Pacific.—The winze on ledge No. 2 has reached a depth of 133½ ft below the old tunnel, or about 160 ft below the surface. The ledge averaged over 20 inches in width all the way down of good ore. For several ft near the bottom it was very rich. A crosscut has been started west at this point to cut other ledges, especially ledge No. 1, distance 40 ft. The main shaft is down over 200 ft, and a contract is let to sink it to a depth of 250 ft, when crosscuts will be started both east and west. The formation is every way favorable at present.

Summit.—The north drift, 200 level, is in 126 ft; progress during the week, 21 ft. The ledge is 10 inches wide, and looks well. The east crosscut from this drift is in 24 ft in very hard rock. The south drift has been advanced, since last report, 35 ft; total length, 211 ft. The ledge here is 15 inches wide. The shaft is now down 50 ft below the 200 level. The ledge in the bottom is two ft wide.

Sigourney.—Work has been resumed on this fine property. The Sigourney is situated at the extreme south end of the mineral belt, so far as it is known to exist. The ledge has been prospected by a tunnel for a distance of nearly 200 ft, and found to be an average width of three ft. It carries silver principally.

Red Cloud Con.—The west crosscut, 400 level, is being extended beyond the Packard and Morton, and is in good vein-bearing ground. It will be continued to Red Cloud ledge No. 2. The east crosscut, same level, is being pushed ahead for the Westchester vein. On the 250 level the ore in the south drift is improving in quality.

South Bodie.—The shaft is down 495 ft. The formation is very favorable. After sinking a sump, a crosscut will be run east and west at 500 ft.

NEVADA.

Scadden Flat Mill.—Grass Valley *Union*, April 16: The stamps of the mill of the Scadden Flat mining company have commenced dropping. The mill contains two batteries of five stamps each. The platform is filled with a good quality of rock taken from the bottom of the mine, in which free gold can be seen, and which carries finely in heavy sulphurets and galena. The ledge in the mine is two ft in size, and no difficulty will be experienced in keeping the stamps going steadily. Besides the quartz taken out by the company, there are several hundred loads on the dump near by which have been raised by the tributers, and is now ready for crushing.

Miscellaneous.—*Foothill Tidings*, April 19: The owners of the Deadwood mine assumed control of the property on the 10th inst., the term of the last lease having expired. They expect to open up the 100 level farther south, on the chute, the north drift on that level having already been commenced. In the Pittsburg the 600 north stopes and drifts are yielding a large amount of good ore. The 700 north stopes are much improved and yielding finely. The 800 north drift and stope are producing a fine quality of ore, and never showed better than at present. The 800 south stopes are also yielding satisfactorily. The mill is kept running up to its full capacity and doing good work. The Idaho paid its 116th dividend this week, being $5 per share, and amounting to $15,500. Over $20,000 was paid out to employees and for supplies—keeping up the circulating medium. The Excelsior water and gravel mining company, of Smartsville, have declared a dividend of 25 cents per share, payable on Monday, April 21st. The tunnel of the Planet gravel mine is in a distance of 1,712 ft. An upraise is now being made to strike gravel. The Gold Hill mining company has levied an assessment of 10 cents per share, payable May 15th. Work on the mine will be resumed about May 1st. A few days ago, $5,000 was produced at a single clean-up from a mine in Little York township, being $2,000 in excess of any previous clean-up. The Milton and the Eureka Lake gravel mining companies each had a clean-up the other day, and though the claims are several miles apart, the result in each case was within a few cents of the same, $41,120. It is estimated by competent judges that during last week from $100,000 to $125,000 was cleaned up in the various gravel mines of Nevada county. The water in the shaft of the Knight of Malta mine has been lowered over 00 ft. It is expected that the water will be out before Monday, and a contract let to sink the main incline 100 ft deeper. The new shaft of the Washington is connected with the 100 level, but it will take some time to square up and timber. The New York mine, in Willow valley, near Nevada, is to be incorporated.

PLUMAS.

Alioth Notes.—Cor. *National*, April 12: The new discovery of Henry Neseman is a continuation of the streak he worked a few years ago, which, at that time, appeared simply as a rich spot in the bedrock (porphyry), without walls or any of the distinguishing evidences of a vein. The present opening is to the southwest of the former one, and reveals a true lode formation, the main paying streak being but a few inches in thickness, composed mainly of micaceous iron, but under the magnifier showing some quartz and iron garnet; the gold being quite free and of a deep, rich color. The wall on the hanging side carries gold in paying quantities through a width of 20 inches. The lead runs northeast and southwest, dipping at an angle of 40° to southeast. The best rock will be hauled to his ranch, and worked in an arastra driven by a horizontal wheel. A little to the south of the Neseman lead is the mine known as the King mine, an agatized quartz, upon which, at one time, a five-stamp mill was operated, but which was moved to the Betterton mine when it was promising so well. South of the King is a series of lodes located by different parties who have, at times, hauled and worked the rock in several ravines where water could be had for driving arastras. The Bullion and Poorman lodes are now being operated in that way by Messrs. Hapgood & Miller. Then comes, still going south, the Santa Rosa, Winnemucca, Sierra, Enterprise, Hawkeye, and Antelope, the latter holding a large percentage of copper; the vein from three to six ft wide, strike north and south, dip vertical. This has been explored by two shafts 1,000 ft apart, with a short tunnel between, and when worked by arastras has yielded a white bullion worth about $9 an ounce. The latter named mine is to be explored by a short tunnel to strike the lead over 150 ft deep, with a view to prepare against another season for active operations, working by one of the leaching processes, preferably the Hunt and Douglas, so as to save the gold, silver and copper, each separately, and nearly chemically pure.

SHASTA.

Opening up.—Reading *Independent*, April 17: The pump at the Donkey mine has been continuously working, and for some time men have been employed in taking out more of this rich and fine appearing ore. They have now a large number of miners at the dump. W. C. Boylan still continues as the Superintendent. The Afterthought mill is nearly done, and would have been completed and running before this but the winter has been so severe that they have got but little wood on hand and have been troubled about getting in other supplies. The new piece of road is done, the flume fully repaired, conveying to the mill the necessary amount of water required. Prof. O'Harra's, and other mechanical appliances that will be used in the new mill, will do away with a great deal of manual labor employed at other mills. The fact is that there will be no hand work used after the ore leaves the dump.

SIERRA.

Bunker Hill Mine.—*Mountain Messenger*, April 12: This mine, situated near Little Grizzly, on the ridge south of Poker flat, is under the active supervision of Hon. C. S. Abbott, and is now being rapidly developed under his management. Mr. Abbott struck pay dirt on the bedrock on the second week in February, and the first week all the men employed at the mine was engaged in drifting, and for several days took out $20 per day to the pick. During the month of March, Mr. Abbott extended tunnels and prepared for an increase of force. The pay gravel continues and the force will soon be increased. A contract has been let upon favorable terms for the company to extend the main tunnel 200 ft. This extension will thoroughly open the main channel and will enable the company to put on a large force. The company having an abundance of living water, a large bullion product will be produced this season.

Bonanza Company.—This company is pushing its work with rapidity, and will have its tunnel into pay gravel by September next, and from the fact of its lying next adjoining the famous Empire mining company's ground, and that the latter worked in rich ground up to the line, there can be no question of its proving a veritable bonanza in fact as well as in name to its owners.

TRINITY.

Cinnabar District.—Cor *Journal*, April 19: The main tunnel runs in a distance of 780 ft to the principal deposit of ore, and they intend running 50 ft beyond, where hoisting works will be built. Fifteen men are at work now besides the Chinese, and are taking out ore at a lively rate. The concentration works are running every day and getting out from 1,200 to 1,600 pounds of cinnabar daily, which will make seven or eight flasks of quicksilver. The retorts will start up the last of this month.

Bullychoop.—Work is going ahead in the Bullychoop & Occidental tunnel, but the progress is slow as the rock is very hard. The Sinclair four-stamp mill is being run to its full capacity. Mr. Knox is looking out a road over which he can get a 10-stamp mill, now on the way from San Francisco, to the mines. Sillcox & Co. continue to get splendid prospects in their new lode. Indications are that Bullychoop will be a lively camp this summer; much prospecting will be done and considerable gold taken from the mines now being worked.

TUOLUMNE.

The Kelsey.—*Independent*, April 19: The Kelsey mill is running night and day on good ore. The rock is soft and easily mined, so there is no difficulty in keeping the mill well supplied. The ore is conveyed from mine to mill in a car running on an elevated wire cable, a distance of some 300 yards. At the mill the car dumps itself and returns to the mine for another load. All the arrangements of the company have an eye to speed and economy in working, evincing an intelligent and systematic management.

Riverside.—At the Riverside, they are making good progress in the lower tunnel which is designed to get under the old workings at a great depth. Patent drills are used, driven by an air compressor. The tunnel is now in very hard rock, and is being made wide enough for two tracks. The mill is running on good rock, but the supply of ore is only sufficient to keep it going in the day time, the force having been reduced, and a gang of men put at work driving the lower tunnel. When this is finished, hoisting works will not be necessary; and it was not deemed economical to go to the expense of putting them up now, as in a few months the lower tunnel would be completed, rendering them of no further utility.

NEVADA.

WASHOE DISTRICT.

Belcher.—Gold Hill *News*, April 23: The south crosscut, 2360 level, has reached vein matter, but not yet the ledge proper. The face is in seams of clay and black dyke. The distance run here shows that the ledge has swung toward the east 80 ft in running south 360 ft. On the 2560 level crosscut No. 1, opposite the incline, is now into the ledge and is encountering quartz assaying from $10 to $12 per ton.

Trojan.—On the 3d level a crosscut has been started east at a point in the northeast drift, 114 ft beyond the upraise No. 5. This crosscut and the drift itself are making fair progress in quartz giving low assays.

Con. Virginia.—The joint drift west on the 850 level is making four ft per day in hard blasting porphyry. The joint drift west from the C. & C. shaft, 2150 level, is making five ft per day in fine-looking vein matter. Sinking at the C. & C. shaft, which has been interrupted by the breaking of a pump rod, has been resumed.

Savage.—The work of overhauling and repairing everything in and about the mine needing it, including the Gould & Curry drift, 1600 level, has been commenced. The water is slowly rising in the mine.

Lady Bryan.—Sinking and drifting north and south on the 600 level. The workings are all looking well, showing bright, lively quartz, but of low grade.

Sierra Nevada.—Sinking in the incline has been very much retarded of late by the heavy influx of water, and the difficulty experienced in keeping the pumps running to their full capacity all the time. The work of enlarging and timbering the north drift, 2200 level, is going rapidly forward, and less than 100 ft remain to reach the incline. The greater part of this distance will be run in the ore body. The pits and tanks in the east shaft have been completed and the drift is being extended north from the 2200 station.

Union Con.—The joint Mexican winze from the 1600 level is being continued on down, pumps having been put

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Meteorological.

On the Anomalous Vertical Distribution of Temperature in California.

Dr. Blake read a paper at a recent meeting of the Academy of Sciences on "The Anomalous Vertical Distribution of Temperature in California." In order to investigate the subject three sets of stations were chosen; one on the Sierra, one in the Tehachapi mountains and one in the Coast range. The Sierra stations were Sacramento, 30 feet; Colfax, at an elevation of 2,421 feet, and Emigrant Gap, 5,230 feet above the sea. The stations in the Tehachapi range were Sumner, 415 feet; Keene, 2,700 feet, and Tebachapi 3,954 feet. In the Coast ranges, Calistoga 400 feet and Dr. Blake's residence 2,100 feet above the sea. The months selected for comparison were Aug., 1878, for the maximum temperatures and Dec., 1878, for the minimum temperatures. Curves were drawn showing the daily temperature of each place in the different sets of stations, the curves for each place being distinguished by different colors. All these stations with the exception of my residence are stations on the different railroads, and it is owing to the rational foresight of the directors in having meteorological observations made at their different stations that we possess the means of elucidating this interesting subject. At these railroad stations the temperatures at 7 A. M., 2 P. M. and 9 P. M., with general observations on the condition of the weather are given, but a regular set of meteorological observations kept at my residence on the St. Helena mountain through the last 12 months, will enable us to connect the temperature anomalies we are considering with other meteorological conditions. In a paper recently read before the Academy by Mr. B. B. Redding, it is stated that "the foothills of the Sierra up to a hight of 2,500 feet, have apparently the same temperature as places in the valley having the same latitude." This is true to a great extent. Certainly it is much nearer the truth than the general opinion as to the effect of elevation in temperature would lead us to suspect. It is a well-known fact that on cold clear nights, low situations are more liable to be affected by frost, but this immunity from frost has been considered to extend but a few hundred feet above the valleys and not to some thousands of feet, as we shall find to be the case in this State. The general opinion of meteorologists is that temperature diminishes 1° for every 300 feet of elevation. If we now consider the temperature curves for December, we shall find that in the Sierra the minimum temperature of the middle station (Colfax, 2431 feet,) was higher than that of the lower station on 27 days, and at the upper station (Emigrant Gap, 5,230 feet,) higher on 18 days than that of Sacramento on the same day. The difference in temperature between Emigrant Gap and Sacramento amounting on some days to 19°, and being frequently at the upper station from 10° to 15° higher. On nine days during the month the minimum at Emigrant Gap was higher than at Colfax. The difference on one occasion being 11° in favor of the higher station. Analogous relations of temperature were found at the two other localities. On the Tehachapi mountains the minimum temperature at Keene (2,700 feet) was higher than that of Sumner on 24 days, and the highest station, Tehachapi (3,900 feet), had a higher minimum temperature then Sumner on 11 days. On the St. Helena range the minimum temperature, at my residence, was above that of Calistoga on 24 days; the difference on one occasion being 24° in favor of the highest station. When we consider a little more closely the above figures, we shall be able to judge what a very extraordinary distribution of temperature they indicate. According to its altitude, Emigrant Gap should have a temperature 17° lower than Sacramento, and yet, on one occasion, we find it 19° warmer, giving an anomaly of 36° above its calculated temperature. My residence is about 1,700 feet higher than Calistoga, and would therefore have a temperature 6° lower, but we find on some occasions the higher station 24° warmer than the lower; an anomalous distribution of temperature of 30° between two places but a short distance apart, and with only 1,700 feet difference in altitude. On examining the curves it will be seen that these anomalous temperatures are the result of a great fall in the temperature at the lower station and a rise in the temperature at the upper station. For instance, from the 2d to 3d of the month there is a fall in the minimum temperatures, at the lower station, of 5°, whilst at the upper station there is a rise of 5° (on the Coast range). On the Sierra there was, at the same dates, a fall of 4° at the lower station and a rise of 7° at Colfax, and on the Tehachapi range there was a fall of 4° at Sumner and a rise of 13° at Keene. In attempting to account for this abnormal distribution of temperature, we may observe on examining the curves that we find two periods during the month in which they either cross each other or come very close together. After diverging during the first four days of the month, they begin to approach each other on the fifth, and on the morning of the sixth we find both in the Sierra and at the Coast range the lower stations with the highest temperature. This change in the distribution of temperature was accomplished by a south wind and a fall of rain. The weather continued disturbed for the next three days, with rain again on the ninth. On the tenth strong north winds set in, and lasted until the 13th. From the 13th to the 24th the atmosphere was calm or light north winds prevailed, and during the whole of this period the upper stations were warmer. On the 24th the curves again came together, and on the 25th the lower stations have the highest temperature in the Coast range and at the Tehachapi mountains, and the minimum temperature is higher at Sacramento than at Emigrant Gap, for the first time for 11 days. This change in temperature distribution was again accompanied by a disturbed state of the atmosphere, snow falling at Emigrant Gap on the 24th. I think in view of these facts the only explanation that can be offered of this anomalous distribution of temperature is, that during a calm state of the atmosphere the lower stratum of air that has been heated in the valleys during the day gradually rises up *en masse*, its place being supplied by the cold air flowing down into the valleys over the surface of the ground that has been cooled by radiation during the long winter nights. This can only take place when there is a calm state of the atmosphere and when radiation is not obstructed by clouds or fogs, conditions that prevailed to a great degree during December. Under these circumstances the heated body of air gradually ascends, and as our temperature curves show can reach an elevation of at least 5,000 feet, and probably much higher. As to the rate at which this heated body of air ascends, farther observations must determine. The loss of heat of the ascending body of air by radiation and mixing with colder air, can be but slight, as the mere ascent of a body of air from the valley to an elevation of 5,000 feet would lower its temperature 27°, and as the highest temperature at Sacramento, for instance, on the 1st of the month, was only 7° higher than the minimum temperature at Emigrant Gap on the next morning, it is evident that the higher temperature at the upper station was not owing to any sudden ascent of warmer air from the valley. We find, however, that at Colfax, on the 1st of the month, the maximum temperature was 67°, and as the difference of level between Colfax and Emigrant Gap is about 2,800 feet, a body of air, in rising from Colfax to the upper station, would have its temperature lowered 14°, so that at the time it reached the level of the upper station its temperature would be 53°. The temperature at Emigrant Gap, on the morning of the 2d, was 51° There are other considerations which support the view I have taken as to the cause of the higher temperature of the upper stations. For instance, on calm nights we often find that the temperature at the upper stations instead of falling during the night is really higher at 7 A. M. in the morning than at 9 P. M. on the previous evening. For instance, taking the first five days in December, during which the air was calm, the average temperature of the different stations at 9 P. M. and at 7 A. M., on the next morning, were:

	9 P. M.	7 A. M.	Difference
Sacramento	50°	41°	—9°
Colfax	49 6°	49.8°	+0.2°
Emigrant Gap	52°	52°	0°

If we now compare the temperatures taken at the same hours from the 11th to the 15th, a period during which a strong northb wind was blowing, we shall see the effect of atmospheric disturbance on the temperature at the same stations:

	9 P. M.	7 A. M.	Difference.
Sacramento	46 6°	35 4°	—5.2°
Colfax	38.8°	34.6°	—4.2°
Emigrant Gap	32.2°	31.6°	—0.6°

In the first case when the air was calm the fall at the lower station during the night was 9°, at the middle station there was a slight rise, and at the upper station the 9 P. M. and 7 A. M. temperatures were the same; the upper station having the highest temperature, the middle station being 2.2° lower, and the lower station 11° colder than the upper. When, however, the atmosphere is disturbed the relative temperature of the stations is completely reversed. We now find the lowest temperature at the highest station, and a fall of temperature at all the stations during the night. The same fact is again illustrated if we compare the mean temperatures of the different stations for the two months, January and December, 1878; the former a rainy and stormy month, the latter calm and clear:

Mean Temperature.

	January.	December.
Sacramento	48.64°	44.86°
Colfax	44.56°	47.05°
Emigrant Gap	34.46°	41.36°

We here find that, in the calm month, the mean temperature of Sacramento is 2° lower than Colfax, whilst in the stormy month it is 4° higher. The difference of temperature between the upper station and Sacramento is only 3.5° lower in December, whilst in January it is 14° lower. This relative distribution of temperature prevails in each of the other localities. It is not quite so strongly marked on the Tehachapi mountain as on the main Sierra, but is greater between the two stations on the Coast range, and undoubtedly will be found to prevail throughout the whole of the interior of the State. The fact is a most important one in its relation to the cultivation of semi-tropical fruits. The only time at which they are liable to be injured, at least up to an elevation of 3,000 feet, is during calm and cold nights, and on such nights as has been plainly shown it is the more elevated places that are the warmer. During our stormy weather, even in midwinter, the temperature never falls low enough at the elevation above given to injure them. At my residence most of the orange trees that were planted out only last season are uninjured. They certainly have suffered less than at Los Angeles, where a temperature of 23° has been reported, whilst at my residence the thermometer has not been lower than 29°. As regards the curves for the maximum daily temperature for August, it is only at the stations on the main Sierra that we find any anomalous distribution of temperature. Both at the Tehachapi stations and on the Coast range we find the highest temperatures at the lower stations. The maximum temperature at Colfax was higher than that at Sacramento on every day of the month except three, the higher station being on some days 12° warmer than the lower. On only three days during the month was the maximum temperature at Emigrant Gap higher than at Sacramento, and it was never as high as at Colfax. On two of the days on which the maximum temperature at Emigrant Gap was higher than at Sacramento, the temperature of the upper air had been raised by an eruption of the warm southwest antitrade current, and on the other occasion, the temperature at Sacramento had been lowered by the winds from the ocean. My observations record a strong southwest upper current on the day preceding the rise in the upper strata, and there is a record of fog on St. Helena mountain at the date in which the temperature at Sacramento fell below that of Emigrant Gap. Both at the Tehachapi and Coast range stations the maximum temperature of the lower stations was always the highest, the average difference between Sumner and Keene being about 10°, and between Calistoga and my residence about 13°. On one occasion the difference was 21°. The same explanation that I have given for the anomalous distribution of temperature during the winter will, I think, explain the higher temperature at Colfax during the summer, viz.: the ascent of a body of heated air from the valley. One of the conditions of the ascent of such a body of air is that its place can be supplied from other sources. During the long winter nights this condition is secured by the cold air flowing into the valleye along the surface of the ground cooled by radiation. In summer no such source of supply exists, at least to any great extent, as the nights are short and the surface of the earth has been heated during the long summer days. At the only place where the anomalous distribution of temperature prevails during the summer months, viz.: in the Sacramento valley, we have a supply of cool air in the winds from the bay which reach there every afternoon, and which continue as a gentle breeze well on into the night. This gives the warmer air of the valley a chance to ascend, and thus it is that here we find a higher temperature at a greater altitude. These sea breezes do not reach the upper part of the San Joaquin valley, and are but little felt at Calistoga, so that at neither of these places can there be much vertical displacement of the heated air of the valleys. The subject of the modification of climate by this vertical displacement of bodies of air is one of much interest, both in its scientific and practical bearings, and one which has not received much attention from meteorologists. I hope on some future occasion to be able to discuss it more fully.

The Hum of Telegraph Wires.—Every boy living in the country near a telegraph line has listened to the hum which can be often heard near a telegraph pole. It is a juvenile theory that the noise is caused by the passage of the messages. The more general notion has been that it was caused by the wind. A writer in an Australian journal, however, calls attention to the fact that one who will give close observation to both the wire and the sounds will find that the latter make themselves obvious when there is a total absence of wind; and in a quiet morning in winter, when the wires appear to be covered with frost to the thickness of a finger, they nevertheless carry on lively vibrations while the air is totally quiet. According to this writer, therefore, the vibrations are due not to the wind, but to changes of atmospheric temperature, cold producing a shortening of the wires extending over the whole length of the conductor. A considerable amount of friction is produced on the supporting belle, thus inducing sound both in the wires and the poles.

"Red Snow."—The phenomenon of "red snow" is visible near Cardwell's Summit hotel. This snow is usually confined to Arctic latitudes, but on the lofty summit south of Mount Stanford, there is a patch of several acres. The surface of the vast drifte, to a depth of three or four inches, is of a beautiful pinkish tint. Scientists differ as to the cause of this wonderful freak of nature, but the accepted theory is that it is produced by myriads of minute organism. The sight of the lofty peake covered with this "red snow" is well worth a trip to the Summit.—*Truckee Republican.*

Frost in a Mine.—The Georgetown *Miner* learns from Col. R. A. Pomeroy, manager of the Stevens mine, that frost has been encountered at a depth of 540 feet while sinking the shaft in that mine. The ground is frozen to a depth of 350 feet, but below that no frost has been encountered until a depth of 450 feet was reached, where the ore, when broken, shows frost and ice through it. The mine is located near Gray's peak, and is about 12,000 feet above sea level.

The Engineer.

A New Range Finder.

A new instrument for measuring distances by sight has been invented by Mr. G. W. Hart, of Croydon. The distance of any object is ascertained thereby, by reading off upon a scale marked on the base of a right-angled triangle the number of divisions which are equivalent to the angle of two lines of sight denoted by an index scale, the two sides of the triangle (*i. e.*, the perpendicular and the hypothenuse) being the two lines of sight to the object, and the length of the base varying with the distance of the object observed at the apex of the triangle. The distance of the same is measured by the length of base required to enable the perpendicular line of sight to meet the object on the oblique line. The oblique line of sight in the instrument is obtained along a radius-arm, the angle of which to the base may be set at pleasure. The part of the instrument forming the other line of sight at right angles to the base has a sliding action along the base (so as to enable the latter to be lengthened or reduced), but is always at right angles to it. For the base a space is divided of 6.282 inches, thus allowing decimal readings of the length of the base to be obtained, (6.282 being the proportion of circle circumference to radius). A scale is provided by means of which the radius arm may be set for oblique line of sight to the decimal of a degree. The process of reading off the distance of an object on the instrument may be thus illustrated. As the chord of arc of an angle is to the radius as 1 to 57.35, then if the radius arm be 57.35 inches, it follows that for an angle of one degree it will be one inch out of perpendicular to the base. The oblique line of sight, being along the radius arm, will, therefore, meet at 57.35, the perpendicular line of sight with one-inch base, and the object (at the apex of the triangle) will be distant 57.35 inches from the observer, *i. e.*, 57.35 times the length of the base line. The base line being divided to scale, the distance of the object may thus be read off.

Improved Tramway Rails.—The object of the following construction of rails for tramways as designed by Mr. J. Gowans, of Edinburgh, is to produce a continuous line of metallic tramway, and to give a steadier vertical support immediately under that part of the table or surface of the rail on which the wheels of the cars tread, by which means a lighter and therefore cheaper rail may be employed than hitherto. The rails are formed of a vertical web, with a continuous flat foot projecting as a flanch on either side. The vertical web is situated immediately under the top table or flat wearing surface of the rails, and the flanch of the foot nearest to that surface is broader than that at the opposite side, in order that a larger area may be exposed at that side of the foot where the load principally presses. The flanch in both cases is made broad enough to constitute a foundation for the concrete or paving setts on each side of the rail. The web of the rail is equi-distant formed with openings, so as to diminish the amount of metal, and therefore lighten it. The rails are jointed together either by plates under the feet, with bolts passing through them and through the joint plates; or a portion of the body of the rail is cut away, and the flanch foot of one rail is made to overlap the flanch foot of the next rail, with bolts passing through the overlapping portion. The rails, as above constructed, may also be jointed by overlapping a portion of their webs, bolts being passed through the overlapping portions; in this case pieces of the ends of the upper surface of the rail and of the foot have to be cut away.

War Application of Boyton's Swimming-Suit.—We learn that the French army has made an ingenious application of Captain Boyton's swimming-suit. A squadron of Cuirassiers—not the men, but the horses—have been provided with this kind of clothing. The horses, thus equipped, have been able to swim across the river Seine with the greatest ease. The double india-rubber garment, after having been filled with air by blowing, is found to be capable of supporting in the water a horse and his rider. This new means of crossing rivers with ease and safety cannot fail to become of much importance in time of war.

New York Elevated Railway.—The business of the elevated railways in New York seems already to have exceeded expectation and to be steadily increasing, week by week. During the months of January, February and March the N. Y. Elevated road carried 7,539,476 passengers, while the Metropolitan Elevated road carried 3,935,623, being a total of 11,475,099 for both roads. Taking the increased facilities for travel that are being prepared by the roads into consideration it is believed that the two roads will carry over 50,000,000 passengers during the year.

The East River Bridge.—The recent decision affirming the liability of New York for additional funds to secure the completion of the bridge, is admitted to definitely settle the question of its rapid completion. It is now reported that work is to be commenced on it at once. The President of the Board of Trustees is reported to have stated that the completion of the structure has been delayed a year by the New York legal complication just disposed of.

The Edison Electric Light.

An apparently well-informed New York correspondent of the London *Times* says that Mr. Edison has failed in his experiments, so far as any really practical results are concerned. The most that he has ever yet accomplished has been to maintain 400 coiled iron wires in a state of partial incandescence with a 16 horse-power steam-engine. The object of this experiment was to ascertain the number of coils which could be brought to a red heat in any given circuit. It is upon this experiment that Mr. Edison based his claim that he could maintain 20,000 lights burning from one electrical station with a 600 horse-power engine. The conclusion was a fallacious one, as Mr. Edison now knows. Platinum must be heated to 2,700° before it attains the intensity of incandescence which is required for illumination, and when the metal is as hot as that it is just on the verge of melting. To prevent the lamp from melting, this inventor has used a regulator consisting of a bar metal through which the current flowed, which, when the current became too strong, expanded and switched off a part of the current and thus saved the lamp. In practice this regulator has failed to perform the service required of it. When the current becomes strong, the platinum burner melts in the twinkling of an eye, and the mischief is done before the regulator can act. The inventor believed that he could overcome this practical difficulty, but he has not succeeded. His lamps have continually melted and he has been unable to keep them from doing so, and the result is that there is great discouragement at Menlo Park.

There has also been encountered, says the same correspondent another difficulty. Fourteen out of the sixteen claims which Mr. Edison calls for in his application for a patent at Washington, have been rejected. This impulsive man took up the electric light last fall as an entirely new subject of experiment, and allowed himself to believe that he saw a way to make the light useful, which others had never thought of; but when he reached the Patent Office, he discovered that very nearly every idea which he had embodied in his applications had either been covered by the patent of other inventors, or was not patentable at all. This information is obtained from the Patent Office, and is one explanation of the discouragement which reigns at Menlo Park.

There is no doubt that the Edison light would be a delightful resource for the illumination of dwellings, if it could be depended upon. It floods a room as though with golden sunlight—pure, brilliant and mellow. But the inventor has never yet been able to regulate his current, so as to keep his lamps burning for any length of time, and he has never ventured on a single public exhibition of it. The public have never seen so much as one of his lights yet. A favored few who have been admitted to his laboratory at Menlo Park have beheld it—a single lamp, inclosed in a glass globe, beautiful as the light of the morning star. But he has refused to let any one inspect it closely, and he has never allowed the exhibition of it privately to last long. He has never been able to depend upon its durability. His apparatus is as far from perfection as it ever was, and in fact, well-informed electricians in New York do not now believe that Mr. Edison is even on the right line of experiment.

Other Efforts at Electric Lighting.

Some seven or eight other parties are in the field, more or less prominently; but none have as yet come much, if any nearer to any practical result, than has Mr. Edison. The efforts of Mr. Sawyer in the attempt to maintain a slender crayon of carbon in incandescence in a sealed globe of pure nitrogen, are also far from success. The light is beautiful, and about all that can be desired; but the difficulties encountered are very perplexing. They consist mainly in the getting rid of every trace of oxygen within the globes and the rapid removal of the heat generated therein by the incandescent carbon. If the heat is not carried off in some manner, the temperature of the nitrogen rises so high that the glass globe is liable to crack in a draft of air or in cooling when the light is extinguished. The cracking of the glass permits the oxygen to enter, and away goes the carbon in 10 minutes' time. In order to obviate this trouble, a coil of very large wire, like a spiral spring, is introduced within the globe, being made to do duty as part of the conduit of the electrical current. This coil absorbs the heat from the nitrogen atmosphere and conducts it rapidly to the large iron plate forming the base of the lamp, and radiates it into the open air. The arrangement promises to answer very well, as soon as the proper size of the globe and wire and plate have been hit upon. He has broken some 50 globes in his experiments; but has finally bit upon what he thinks is the correct proportions. The removal of the oxygen gives him the greatest trouble. The carbon itself seems to carry sufficient oxygen to work its own destruction at a slow but sure progress.

The Electric Light in San Francisco.

A company has been formed in this city with the view of introducing the electric light here, for general use in the streets, public buildings, and stores. The announcement has been made that the company has already entered into a contract for lighting Kearny street, from Clay to Market, with four electric lights to the block, each light to be of 1,000 candle power. Several stores and saloons on the same street have also desired to be supplied with the light. Arrangements are progressing for the lighting of the Mechanics' Pavilion during the next fair there. The company is experimenting with a patent regulator, with which the light can be increased or diminished at will. They have bought a number of patents for use on this coast, but we believe they are working mainly upon the Jablockhoff process, which was brought into quite prominent notice at the late Paris exhibition. Although the electric light is yet far from being a success, enough has been done to assure the highest promise of an ultimate triumph of electricity over gas.

Good Health.

Why so Depressing?

During the early spring months it is common to hear persons speak of their feelings in the manner the London *Lancet* describes, as follows: "Unwonted depression and uneasiness, accompanied with loss of appetite and inability to sleep, are the prevalent causes of complaint just now among the 'tolerably well' section of the community; and, with a large measure of accuracy, the condition, modified as it is by individual peculiarities of state and idiosyncrasies, is attributed to the weather. The relations which subsist between such mental depression as constitutes melancholia and the defective discharge of its functions by the skin may help to explain the phenomenon. The connection of cause and effect may not be clearly made out, and the part which the nerve-centers play in the production of the result may be as obscure as that which they exercise in the control of occasional pigmentary deposits; but the broad fact remains. When the skin does not act freely, when its functions are seriously impeded or arrested, melancholy broods over the mind, just as in the case of a subject of melancholia, as a formulated disease, the skin becomes dense and inactive. It is not a random conjecture, therefore, that the intense and prolonged, albeit unaccustomed and unexpected, cold and damp work their depressing influences mainly through the skin. This is a trite remark, but it is one that may, with advantage, be made just now, because, in the interests of health preservation, especial pains need to be taken to secure the freest possible action of the great surface system of excretory glands and the transuding apparatus generally. Warmer clothing, especially at night, frequent ablutions, with sufficient friction, and the promotion of skin activity by every legitimate form of exercise, are obvious measures of health which everybody ought to understand and all should practice.

A Chapter on Stings.

The pain caused by the sting of a plant or insect is the result of a certain amount of acid poison injected into the blood. The first thing to be done is to press the tube of a small key from side to side to facilitate the expulsion of the sting and its accompanying poison. The sting, if left in the wound, should be carefully extracted, otherwise it will greatly increase the local irritation. The poison of stings being acid, common sense points to the alkalies as the proper means of cure. Among the most easily produced remedies may be mentioned soft soap, liquor of ammonia (spirits of hartshorn), smelling salts, washing soda, quick lime made into a paste with water, the juice of an onion, tobacco juice, chewed tobacco, bruised dock leaves, tomato juice, wood ashes, tobacco ashes and carbonate of soda. If the sting be severe, rest and coolness should be added to the other remedies, more especially in the case of nervous subjects. Nothing is so apt to make the poison so active as heat, and nothing favors its activity less than cold. Let the body be kept cool and at rest, and the activity of the poison will be reduced to a minimum. Any active exertion whereby the circulation is quickened, will increase both pain and swelling. If the swelling be severe, the part may be rubbed with sweet oil or a drop or two of laudanum. Stings in the eye, ear, mouth, or throat sometimes lead to serious consequences; in such cases medical advice should always be sought for as soon as possible.—*Horticulturist.*

How to Keep Ice in the Sick-Room.—For those who have an abundant supply of ice, this may not be a matter of much moment; but for poor people, who may rarely use ice except in sickness, and to whom the expense is not insignificant, the following hints from an English source may be useful: "Cut a piece of flannel about nine inches square, and secure it by a ligature round the mouth of an ordinary tumbler, so as to leave a cup-shaped depression of flannel within the tumbler to about half its depth. In the flannel cup so constructed pieces of ice may be preserved many hours; all the longer if a piece of flannel from four to five inches square be used as a loose cover to the ice-cup. Cheap flannel, with comparatively open meshes, is preferable, as the water easily drains through it, and the ice is thus kept quite dry. When good flannel with close texture is employed, a small hole must be made in the bottom of the flannel cup; otherwise it holds the water and facilitates the melting of the ice, which is, nevertheless, preserved much longer than in the naked cup or tumbler. In a tumbler containing a flannel cup, made as above described, of cheap, open flannel, at 10d. (20 cents) a yard, it took ten hours and ten minutes to dissolve two ounces of ice, whereas in a naked cup, under the same conditions, all the ice was gone in less three hours."

The Poison of Serpents.—Some interesting observations have recently been made on the poison of serpents by M. Lacerda, in the physiological laboratory of the National Museum, at Rio Janeiro, and which have led the experimenter to conclude that, in some cases at least, the venom contains an organized ferment, presenting some analogies to bacteria. M. Lacerda states that a drop of poison removed from a rattlesnake under the influence of chloroform, and examined with the aid of the microscope, appears as "a species of filamentous protoplasmic matter, consisting of a cellular aggregation disposed in arborescent form resembling certaioly copods." These cells are fully described in a paper read before the French Academy of Sciences. Similar phenomena were observed in the blood of animals that had been bitten by a rattlesnake, and it was found that such blood was capable of setting up the same change in the blood of other animals when injected hypodermically, and that this change was always followed by the death of the animal.

Religion and Chloroform.—Dr. B. W. Richardson lately gave a Sunday afternoon lecture in London on "Anæsthetic Sleep and Temporary Abolition of Pain." He remarked that the credit of having introduced chloroform belonged to the late Sir James Simpson, of Edinburgh. Its introduction and application were objected to on religious grounds, some people contending that man, according to Scripture, should endure pain and trouble throughout life. Sir James Simpson threw the scriptural argument back upon those who used it by saying that when the first man had an operation performed upon him he was put in a deep sleep, and knew nothing of the time when the rib was taken from him.

A Recipe to be Miserable.—The best recipe we know, if you want to be miserable, is to think about yourself, how much you have lost, how much you have not made, and the poor prospect for the future. A brave man, with a soul in him, gets out of such pitiful ruts and laughs at discouragements, rolls up his sleeves, whistles and sings, and makes the best of life. This earth was never intended for a paradise, and a man who rises above his discouragements and keeps his manhood will only be the stronger and better for his adversities. Many a noble ship has been saved by throwing overboard its most valuable cargo, and many a man is better and more humane after he has lost his gold.

Useful Information.

Shoemaker's Wax.—Shoemaker's wax, when made for hand work, is composed generally of equal quantities of pitch and resin, with 10% of tallow; after boiling (if good wax), it is pulled until the wax assumes the color of pale resin. The pulling takes out, or, more properly, bleaches, the ingredient pitch, and thereby takes out the coloring all pitch contains. Wax used for machines has all of it too much pitch and tar for clean work. The coloring matter in pitch and tar comes up through the grain; once in it cannot be got out—and wax boiled or heated again, unless in a perfectly clean vessel, and even then, partly recovers the coloring bleached out by hand pulling. Wax that will work up the pure bronze color so much liked by shoemakers may be made of four pounds of resin, one pound of pitch, four ounces of beeswax, three ounces of tallow—the tallow to be refined, otherwise three ounces of the best sperm oil. The beeswax seems to destroy the coloring matter of the pitch when in that proportion. A good resin wax is superior to any other composition for wear, because it decomposes on exposure and wear into a stony substance in appearance, and looks not unlike pegs of amber when put under the microscope. Wax, with tar at all in it, or much pitch, when heated continuously, becomes only a dirty discoloring matter, as the oil evaporates, carrying with it all the valuable adhesive or glutinous properties of the pitch, and such wax will most readily soil or discolor the flange of the channel that is laid over it. The above recipe makes a wax which will give satisfaction.

Steeling Copper Plates.—One hundred parts of ammonio-ferrous sulphate and 50 parts of ammonium chloride are dissolved in 500 parts of pure water, a few drops of sulphuric acid are added, the liquid is maintained at 60° to 80°, and the copper plate is immersed in this liquid, and is made the cathode of a system of two or three Bunsen's cells, the anode consisting of an iron plate equal in size to the copper. In a few minutes the copper plate becomes covered with a hard steel-like deposit of iron.—*Chem. Centr.*

Dry Coating for Basement Walls.—Take 50 pounds pitch, 30 pounds resin, 6 pounds English red, and 12 pounds brick-dust. Boil these ingredients and mix them thoroughly; then add about one-fourth the volume of oil of turpentine, or enough to flow easily, so that a thin coating may be laid on with a whitewash or paint brush. Walls thus coated are proof against dampness.—*Der Techniker.*

Porosity of Building Stone.—The Buffalo *Commercial* gives the following account of an interesting experiment with building-stone in that city: "Professor Doremus, of the Buffalo Medical College, recently performed a very interesting and instructive experiment before his class. A block of sandstone, such as is usually employed for window caps and sills, and about 12 inches square and four or five inches thick, had a panel one-half an inch deep in each side. In each panel was fitted a block, which was perforated by a piece of common gas-pipe, and this was cemented about the edge. The whole was then coated with an impervious varnish. Air now entering the pipe on either side had access to the clean surface of the stone beneath the panel, and it was found that if the mouth be applied to the protruding pipe on one side, and a candle be placed in front of the opposite one, it could be very readily blown out by the air, which, with very little effort, was forced through the stone. When a rubber tube was connected with the house gas-pipe on one side of the stone, and a burner was attached on the opposite side, the simple pressure from the gas main was sufficient to force the gas through the stone till it was lit at the burner on the opposite side. When by any means the pressure was increased, a very large flame was thus produced. This shows the permeability of building stone. Brick walls and the plastering of rooms are much more porous, and it is readily seen that unglazed tile, or stone, or brick sewer, affords but little security against the escape of sewer-gas."

To Tan Lace Leather with Soft Soap.—The skin or pelt should be unhaired with lime in the usual way, and, after the hair is removed, the pelt should be freed from lime as much as possible. This can be done with warm water or the ordinary bates. When thus prepared, the pelt is immersed in soft soap and frequently handled, just as in tan liquor. The soap should be kept up to the usual strength, otherwise the pelt will perish. Indeed, there should be rather an excess of alkali over the grease always maintained. The ordinary soft soap bought in stores is not strong enough; but strong country-made soft soap will tan or taw the pelt in a few days. After the pelt is struck through, it should be scraped off and dried; when dry, or nearly so, it should be *mooned* until soft. No oil or other finishing will be required. This process will make tough lace leather that will not become tender by age, and it is withal a cheap process. Its excellence has been tested by some of the best manufacturers in the country.

Sal Soda for unhairing hides and skins is used in connection with lime and sulphur. The particular merit of the soda lies in the readiness with which it removes all grease from the hides, but, used alone, its action would be too severe, and sulphur is employed to counteract this. For a pack of 50 hides, slake 80 pounds of stone lime, and with the thick paste which this yields knead thoroughly 10 pounds each of soda ash and pulverized sulphur, mixing with only a small portion of the lime at first, but completing the mixture while the lime is yet warm; to this add lime liquor, mixing thoroughly, and then pour into the vat and plunge the whole. No more liquor should be in the vat than sufficient to cover the hides when thrown in. The lime should be kept up to summer heat, and the stock should be handled at least once or twice a day.

To Clean Marble.—Common soda, two parts; pumice stone (pulverized), one; finely powdered chalk, one. Sift through a fine sieve and mix with water. Rub all over the marble until the stains are removed. Then wash the stone with soap and water. Marble that is yellow with age, or covered with green fungoid patches, may be rendered white by first washing it with a solution of permanganate of potash of moderate strength, and while yet moist with this solution, rubbing with a cloth saturated with oxalic acid. As soon as the portion of the stone operated upon becomes white, it should be thoroughly washed with pure water to remove all traces of the acid.

New Uses of Sawdust.—We have tried the experiment in our garden of mixing the rich, heavy, solid, clayish earth with sawdust, and find it makes the soil loose, giving a chance for water and air to penetrate, preventing the hard caking on the top, which before was a most objectionable fault, while the plants and seeds grow better than ever before. We ought to mention that we have also added some bone-dust, and moistened all with a weak solution of nitrate of potash.—*Ex.*

Brass Solder for Iron.—Melt the plates of brass between the pieces that are to be joined. When the work is very fine the parts to be brazed should be covered with powdered borax, melted with water, so that it may mix with the brass powder which is to be added to it. Expose the piece to a clear fire in such a manner that it shall not touch the coals, and let it remain till the brass begins to run.

Fire-proof paper for valuable documents may be made from one part vegetable fiber, two parts asbestos, one-tenth of a part borax, nine-tenths of a part alum. A fire-proof ink for the same may be made from 850 grains graphite, 80 grains copal varnish, 75 grains copperas, 300 grains tincture of galls and indigo carmine.—*Der Techniker.*

MINING AND SCIENTIFIC PRESS.

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The Week.

The mining outlook on the Pacific coast still continues unusually promising. In California the operations are everywhere keeping pace with the bountiful facilities afforded by the season. Bodie shares continue to gain in favor in the stock market and the town itself is crazed over the richness of its new placer diggings. Shasta has new finds in old workings, and Amador prospects of rich new discoveries. The Monterey coal mines are being actively opened up, and promise soon to become profitable. In Nevada, operations are more quiet. The Comstocks remain dull and listless, but from the outside districts, and especially the new placers, come reports of valuable locations and rich discoveries. Important developments have been made in the Good Hope district, and the camps present a very lively appearance. The Paradise mines speak solidly through their constant bullion shipments. In Colorado the condition of things is equally good. Leadville continues to be the center of attraction, and their local papers are full of successful finds by their prospectors. The adjacent country seems almost wholly made up of the silver carbonate ore. The new diggings at Ten Mile and Middlepark, however, are rapidly advancing to a position of equality with Leadville. Idaho is wide awake, but suffers from inaccessibility and lack of capital. Silver Reef, Utah, is operating more extensively and producing more bullion than ever before. New Mexico is interesting California capital. And finally Arizona sees interest settled on the Tombstone district and the southeastern part of the Territory generally.

The Mining Industry—Its Condition and Outlook.

Thus far during the current year the business of mining for the precious metals on this coast has been well prospered. We speak, of course, of productive mining, the speculative branches of the business having suffered unusual depression. Hardly ever have stock operations so languished. The revealment of other bonanzas on the Comstock, now deemed imminent, will be likely, however, to restore animation to the mining share market. Whether or not this shall prove to be the case, certain it is the working miners are pushing their labors with unwonted energy and with every prospect that they will harvest this year a full crop of bullion. Never since the first pan of dirt was washed at Sutter's mill, has mining seemed to be in a more healthful and progressive condition than at present. That the investors and toilers in this field of industry are really about entering upon a season of large and prolonged prosperity can hardly be questioned. The weather thus far has been exceedingly propitious. The rains coming at regular intervals and in acceptable quantity have afforded water for all—the quartz, the drift and the hydraulic miner alike. There has been water enough for every use without damaging floods. The temperature has, for the most part, been moderate, favoring hydraulic washing and other outdoor work. A good body of snow has accumulated on the mountains, insuring to this class of miners a working season of average length, at least. As these parties had gotten their claims in good shape betimes, they have been able to make the most out of the water since the advent of the rains, washing having gone on with less interruption than usual. Already some extremely large and many satisfactory clean-ups have been made, leaving little doubt but the product of gold dust from this source will, the present season, be large beyond precedent.

Meantime, the Dehris case, lately decided against the miners, goes to a higher court on appeal, the defendents having executed an indemnifying bond and proceeded with their gravel washing as before. A party of experts from the office of the State Surveyor-General have for some time past been engaged on the Yuba ascertaining the quantity of this mining debris that has been and is hereafter likely to be deposited in the bed of that river and the effects thereof, and in collecting such other facts as may be useful in determining the issues now pending between the farmers and the miners. After finishing their work on the Yuba this party will make a like examination of the tailings on Bear river. As this action by the public authorities evinces a desire on their part to obtain full and reliable information on this subject, it may be expected that these issues will finally be settled in a just and impartial manner. It is not likely that the miners will, in any event, be estopped from further operations, some plan being hit upon by which the land owners will receive reparation for damage hereafter done their property.

In consequence of the growing difficulty of obtaining a sufficiency of water for operating by the hydraulic method, a decided impetus has been given of late to drift mining in this State. All along the old channels shafts are being sunk or tunnels driven to open up this class of deposits, a large proportion of these works having been commenced within the past year or two. As it takes some time to complete these openings, not many of this class of claims have yet been brought to a productive state. Of those that have been advanced to a working point, almost the whole are making such satisfactory returns that we may safely count on an increased production from this source of 50% or 60% within the next 12 months. In this connection it may be observed that the Cranson elevator is now being employed to raise the gravel from the old channels that lie too deep to be bottomed by tunnelling, and sometimes also in cases where the tunnels run have been too high. The old plan of employing stamps to crush the cement, too hard to be dissolved in water, is also again coming into vogue, and with some chance of finally reaching a larger use than ever before. As we sometimes rewash the material that has been once and perhaps several times washed before, so do we occasionally find it expedient to re-employ methods that had fallen into partial disuse or been wholly discarded, this return to the stamp mill being an example in point.

Twenty-five years ago river bed mining was extensively engaged in, but afterwards came to be almost wholly abandoned. Now it is again becoming popular, and it would not be surprising if it should soon reach proportions never dreamed of by the early miners. We hear of preparations being made in many parts of the country to dam the rivers and by turning their waters into flumes make dry their beds, which will then be washed in sluices and made to yield up the gold they contain. While there will be quite a number of these enterprises set on foot in California the coming summer, there will probably be still more undertaken in Oregon, Idaho and Montana.

Some experiments were made last year along our rivers with steam dredges, none of which were attended with satisfactory results. Further trials are to be made with these machines this summer, the investors being under the impression that they can make them a final success.

As the gratifying results that have, in one instance, been reached in rewashing the mining debris on a large scale, will be sure to lead to further efforts of that kind, we may expect to see large quantities of this material in like manner turned to good account in a short time. Millions of tons of these rich tailings have made lodgment along the various streams on which hydraulic mining has been in progress for the past quarter of a century, and yet only last fall, in Indian canyon, Placer county, was the first well-planned effort made to utilize them on an extensive scale. As above intimated, this effort having turned out well, these gold-bearing slums will, no doubt, be attacked elsewhere, and instead of lying as heretofore a dead waste, threatening even in some instances to block up the outlet to the mines, be converted into bullion-producing factors and sources of profit. The plan of driving tunnels under these masses of tailings, for the purpose of extracting the deposits of rich gravel they are supposed to overlie, has not yet been sufficiently tested to determine its utility, none of these tunnels having yet reached their objective point. Of their ultimate success, however, the parties driving them are very sanguine.

Aside from these schemes and devices for exploring and reworking the old placers, some new deposits of this kind are constantly being brought to light. The most recent of these discoveries are the diggings found in the town of Bodie, where a considerable area of auriferous gravel has within the past month been found and which, if only there were water at hand, might be deemed a matter of moment. As it is, quite a number of men have made fair wages washing the dirt with the limited facilities within reach. The Snake River mines, though not likely to pay as largely as at one time expected, will still afford remunerative employment for several thousand men. The shallow placers recently struck in San Luis Obispo county and the beach deposits of Santa Cruz, afford employment to a not over thrifty class of miners, who would rather earn a dollar a day at gold washing than two dollars at anything else. Of the condition and prospects of vein mining throughout our Pacific States and Territories we shall speak more at length in our next issue.

Hydraulic and Drift Mining.

The only branches of placer mining in California that are now making, or that are hereafter likely to make any very large production, are the hydraulic and the drift. While the class of gold-bearing deposits to which these methods of operating are respectively adapted continue to be very extensive, hydraulic washing will soon have reached its limit of greatest expansion by reason of the entire appropriation of all the water obtainable for that purpose. Already every lake and stream within easy reach has been secured and utilized by the various companies now in the field and actively engaged in this branch of the business. Only a few sources of water supply remain to be availed of, the most of these being inconsiderable in extent, and difficult to command. With the exception of Lake Tahoe and the Blue lakes, the latter lying near the summit and the former wholly beyond the main range of the Sierra Nevada, there remain no where any large streams or bodies of water that have not been taken up and in most cases already drawn upon by these companies. As the introduction of water from Lake Tahoe into the mines lying on the westerly slope of these mountains necessitates the construction of a long and costly tunnel, some time must elapse before any water can be obtained from that source; only by an increment of storage capacity to be effected through an enlargment of the old, or the construction of new reservoirs, can these companies much augment their present water supply. For increasing the latter by the above means the facilities are in some instances excellent, while in others they are of a very limited kind.

Nearly all the self-supplying companies operating along the more central portions of the main gold belt will be able to increase their water storage from 20% to 60% by raising the dams at the outlets of their present reservoirs, as they contemplate doing, or by building new reservoirs on sites already secured for the purpose. This is the condition of things in the tier of counties extending from Mariposa to Plumas. When this work of enlarging old and building new reservoirs is accomplished, as it probably will be in the course of a few years, then this class of hydraulic mines will have reached their maximum of gravel washing, though not necessarily of bullion production, as the deeper they go the better the ground is apt to pay. Further north in Trinity and Siskiyou counties, while all the water readily available has in like manner been taken up for mining purposes, no provision has as yet been made or required for storing the same, the most of it having, in fact, thus far been suffered to run to waste; and this, not because there is in that section of the State any scarcity of ground on which it could be employed to advantage. On the contrary these counties contain immense deposits of rich gravel, the most of it so favorably situated that it can be handled readily and with decided profit.

In the northern part and about the middle of Trinity county rises a group of tall mountains, their crests reaching an elevation of 11,000 feet and holding heavy bodies of snow the year round. Circling about these mountains and skirting them on three sides is the Trinity river, a large stream kept well replenished by numerous confluents from these central snowy peaks. This river traverses the principal gold-bearing belt of this region, which, coming in from the northeast sweeps in like manner around these mountains, passing on towards the northwest; the whole forming a finely blended and perfect system of water supply, distribution and auriferous gravel, such as exists hardly anywhere else in the State. Some of the feeders of the Trinity, such as Stewart's fork, the North fork and French creek, carry large volumes of water, the whole of which can, by means of short canals, be delivered on the adjacent gravel banks under heads varying from 200 to 600 feet. Along Stewart's fork quite up in the mountains occurs a series of natural meadows, which at little expense could be converted into capacious reservoirs, greatly prolonging the working season on Buckeye ridge, Brown's mountain and other rich and extensive gravel deposits commanded by that stream. Further north in Siskiyou county there exist like opportunities for enlarging the water supply, much water there, as in Trinity, being suffered to run to waste.

But, as before remarked, along the mineral range to the south, these resources have been so nearly utilized, that we are able here to see about the limit of hydraulic mining's greatest expansion, leaving to those who would engage in placer operations only the choice of buying hydraulic properties already equipped and supplied with water, of embarking in the business in these more northern counties or else in turning their attention to the drift diggings, which, less monopolized and less developed, present in many parts of the State good openings for investment. Wherever there are hydraulic mines there also will be found drift diggings, the latter consisting of that class of deposits which, on account of the great quantity of superincumbent barren matter or for other reasons, cannot be advantageously worked by the hydraulic process.

For a long time drift mining, because of the many failures that attend it, was accounted a specially hazardous business. But of late years this has so far changed that it has come to be considered quite as safe as any other branch of mining, while it presents some advantages peculiar to itself. In the first place, it can be carried on with but little water and without regard to outlet or head, and can, therefore, be prosecuted with success where hydraulic washing would be impracticable. For plant but little outlay is required, giving it a preference with parties of small means over vein mining. Once the drift miner has reached his stratum of pay gravel it is an easy matter to keep it till worked out, and where it lies, as it usually does, in one of the ancient river channels, it is apt to hold for a long distance.

Two means are adopted for opening and working this class of deposits, one by shafts and the other by tunnels, according as conditions require. In adopting the latter method many mistakes were at first committed, the tunnels being usually driven on too high levels. Latterly these mistakes have been less frequent, have, in fact, been of rare occurrence, adding much to the success of this class of operations, a good many of which have recently been set on foot. As this branch of placer mining, by reason of its improved outlook, is beginning to attract more attention than in times past, we will in our next issue speak of several of the more prominent companies now engaged in it, some of whom have been a number of years at work, while others have but recently entered the field.

The Edison Electric Light.—Since our outside went to press with the article under the above heading, the following paragraph from a New York paper has come under our notice, which we give in justice to Mr Edison: In reply to the letter sent from this city to the Boudoir *Times*, stating that Edison's electric light was known to be a failure, Prof. Edison says the letter is a mass of misstatements, evidently made up in the interest of gas men. He showed in detail how thoroughly incorrect were the points made in the letter, and declared that his electric light is a complete success, and can be furnished at one-third the cost of gas. He expects to make the whole thing public within two months. He will burn 500 lights at Menlo Park until the stockholders are perfectly satisfied. The delay had been the want of a perfect generator of electricity, and this Prof. Edison has himself added to his inventions. It has been supposed that the lamps themselves would be very expensive. They are simply a small coil of platinum wire placed in a glass bulb. Prof. Edison says they will cost, bulb, platinum, and all, not more than $1.50 apiece. He is making his own bulbs, having picked up the art from a perambulating glassblower.

A young man named Rogers, recently from the East, while prospecting in Mud Springs township, El Dorado county, struck a pocket, from which he took out over $500 one day last week.

It is proposed to abolish capital punishment and utilize murderers as a dispensatory for the afflicted, using them up gradually in skin grafting and similar operations.

Relation of the Mono Volcanoes to the Glacial Drift.

[On the Extinct Volcanoes about Lake Mono and their Relation to the Glacial Drift. A Paper read before the Geological Section of the California Academy of Sciences by PROF. JOSEPH LECONTE.]

In 1870 and again in 1872, in company with a party of students and graduates of the University of California, I visited the Mono region. But on both occasions my attention being specially directed to the study of the ancient glaciers, I examined the volcanoes only somewhat cursorily. In 1875, with a similar perty, I again visited the same region, and this time remained longer and examined more carefully, though on account of an unfortunate accident not so long or so fully as I desired. I have put off from year to year the publication of the results of my observations, in the hope of again visiting the region and settling some doubtful points which still remained. There seems now, however, little likelihood that I shall ever be able to carry out my intention, for other questions of still greater interest have in the meantime engaged my attention. I will therefore no longer withhold my imperfect observations, hoping that they will be corrected and extended by others.

General Description of the Region—Eastern Slope of the Sierras.

As already explained in previous papers,* the general form of the Sierra is that of a great wave ready to break on its eastern side. It rises from the San Joaquin plains by a gentle slope which extends 50 or 60 miles, reaches a crest 13,000 feet high, then plunges downward by a slope so steep that it reaches the plains of Mono 6,000 feet above sea level, in five or six miles. In glacial times long, complicated glaciers with many tributaries occupied the western slope, while on the east comparatively short, simple glaciers came down in parallel streams and ran far out on the level plains and into the swollen waters of Lake Mono; which, then near 700 feet above its present level and far beyond its present limits, washed against the base of the Sierra itself. There can be no doubt that these glaciers formed icebergs which floated on the surface of the great inland sea and dropped debris over its bottom.

The Plains.

Surrounding Lake Mono and sloping imperceptibly to its surface, is a nearly level desert plain covered with volcanic sand interspersed with fragments of pumice and obsidian, and overgrown with sage-brush *(Artemisia tridentata)*. It is undoubtedly an old lake bottom, subsequently covered with volcanic ashes. The dreary prospect of this desert is relieved by the magnificent irregular Sierra-wall trenched with deep canyons; by long parallel moraine ridges stretching like arms from the mouth of each canyon, five or six miles out on the level plains, and bounding the pathways of ancient glaciers; by a fine cluster of recently extinct volcanic cones 15 to 20 in number and very perfect in shape; and finally, by the bright waters of the lake studded with picturesque islands.

Moraines.

Some of the parallel moraines which form so conspicuous a feature of the scene, especially those of Bloody canyon, I have already described†. From the top of any of the higher volcanic cones many others may be seen stretching out upon the plains. These moraines ridges average 300 to 400 feet in hight, and five to six miles in length, but some of them, especially those at the head of Rush creek are much higher. The view of glacial moraines here presented is incomparably the finest I have ever seen.

Lake.

Lake Mono is a fine sheet, 14x10 miles in extent. There being no outlet, the waters are of course saline. It is essentially a strong solution of sodium carbonate, with smaller proportions of lime carbonate, common salt and borax. To the taste it is simply a concentrated solution of carbonate of soda. While camping on its margin we found its powerful detergent property very useful in clothes-washing. The mineral contents are probably partly the concentrated leachings from the volcanic rocks which cover the whole plain—the alkaline silicates of these rocks being changed into alkaline carbonates by carbonic acid of the air—and partly contributed by springs which issue in many places from the bottom and around the margins of the lake, and were probably more numerous and active in former times. In any case the lake waters are now but the concentrated residues of a much larger body of water, as plainly shown by the terraces to be presently described. During the process of concentration the less soluble lime-carbonate has been deposited in strange irregular masses of calcareous tufa. These curious fungoid and coralloid masses, some of them six to ten feet in hight, stand up thickly on the level shores, and in the shallow marginal waters of the lake. At a distance they look like the half submerged stumps of a forest of gigantic trees. This carbonate of lime deposit is evidently identical with the thinolite deposits described by King‡ as occurring in such immense quantities about the residual lakes of the Nevada basin farther north, and which as he shows is a pseudomorph of carbonate of lime after gaylussite. The condition under which the deposits took place about Mono are probably, however, slightly different from those in Nevada, and I believe throw much light on the general question of thinolite deposits. It deserves careful study and we hope to take it up in a subsequent paper. Farther east, near Columbus, Nevada, in the region of the dried-up lakes left at the extreme southern extension of King's ancient Lake *Lahontan*, occur remarkable deposits of ulexite (soda lime borate) which also deserves separate study.

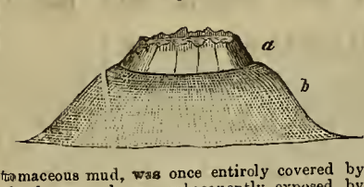
Terraces.

I have already mentioned the terraces about Lake Mono. Several of these are very distinct, and traceable all around the lake, but they are seen in greatest number and most distinctly on the west side where the lake approaches the Sierra and the hills rise abruptly from the lake-level. Five or six may be counted, rising one above the other like level benches, the highest being, according to Whitney, 680 feet high. These terraces are undoubtedly the marks of old lake levels, and show not only a former greater depth, but also a much greater extent of the lake water. The highest level traced about the lake would reach the moraines at the foot of the Sierra, extend beyond the plains on every side, and enclose an area many times greater that the present lake area. There can be no doubt, therefore, that the great glaciers of that time ran into the lake and formed icebergs.

Islands.

Near the center of the lake there is a group of volcanic islands in direct line with the group of volcanic cones on the plains to the south, and doubtless a continuation of the same line of volcanic activity. The largest of these islands is about two and a half miles long, a mile wide and about 300 feet high. It is composed mainly of extremely fine whitish material beautifully and very finely laminated, the differently colored laminæ being very distinct and scarcely thicker than a card board. This material is spoken of by Whitney* as volcanic ashes. Under the microscope it proves to be composed wholly of *diatom shells* with only an occasional grain of sharp sand. There is no doubt, therefore, that it was deposited very slowly in calm waters in the middle of the lake and beyond the reach of detritus. The stratification is mostly horizontal. Only in two or three places where the deeper strata are exposed on the cliffs by the action of waves, I observed a slight dip, and in one place a gentle but distinct *anti-cline*, showing a quiet upheaval of the whole mass, as I think, by volcanic forces. In the highest parts of the island the soft horizontally laminated earth is sculptured by erosion into sharp pinnacles and turrets, like bad land structure on a small scale. On the eastern portion of the island a considerable area of black basaltic rock is exposed, but this is no where more than 50 feet high. Where the diatomaceous earth comes in contact with the basalt, the former always overlies the latter in undisturbed horizontal layers. I conclude, therefore, that the basalt preceded the formation of the diatomaceous mud, was once entirely covered by the latter and was subsequently exposed by erosion.

Fig. 1.



Steam and boiling water issue in many places in this rocky portion of the island and in the shallow water in the vicinity. I observed, also, in the earthy portion crater-like depressions containing a little saline water, which were probably produced by similar fumarole action now extinct. According to Whitney (p. 453), two distinct true craters occur in the basalt on the northeast portion of the island, but these I did not see.

The other, and much smaller islands, I did not have time to visit, but according to Whitney they are wholly basaltic, and the largest of them is 300 feet high and is a well-defined volcanic cone.

The general conclusion at which I arrived from my examination of the largest island, was that the basaltic portion was first formed at the bottom of the lake, or else subsequently submerged; then the diatomaceous mud was deposited covering it up completely; then the fine mud bottom was raised into an anti-cline and exposed as an island by the fall of the lake level; and finally erosion sculptured the whole, and in part exposed the underlying basalt.

Volcanoes on the Plain.

We have already alluded to a conspicuous group of volcanic cones situated on the level plain to the south of the lake. These are 20 or 30 in number, extending in a line, from near the margin of the lake, to a distance of 10 or 15 miles, and vary in hight from 200 to 2,700 feet above the plain. Partly from the recency of their extinction and partly from small rainfall of the region, they are, some of them, as perfect in form as if they were still active. A good general view of these is given by Whitney in his account of this region. The typical form of the more perfect is shown in Fig. 1, which, though intended only as a diagram, is yet a tolerably correct outline of the highest and most perfect. The upper part, *a*, is a light-colored pumiceous lava, and the lower part, *b*, is covered with sand of the same.

In many cases I observed a very perfect cone-and-rampart structure, such as is known to be produced by great eruptions followed by smaller ones; or, perhaps, in some cases by an engulfment of the crater into the base of the cone. The most perfect example of this kind is found in a small and easily accessible cone not far from the lake. Fig. 2 is an ideal section and half perspective view of this cone. It consists of a low sand cone about 200 feet high with a perfect circular crater 1½ or 2 miles in circumference, from the center of which rises a trachytic cone and crater of much smaller dimensions to about the same hight. From the shattered condition of the inner cone Mr. Muir suggested to me the possibility of the engulfment of the upper rocky portion into the lower sandy portion of a once much higher cone. But in many other cases observed this explanation is evidently untenable; for in some cases we found several small cones surrounded by one rampart. Such could only be found by successive eruptions.

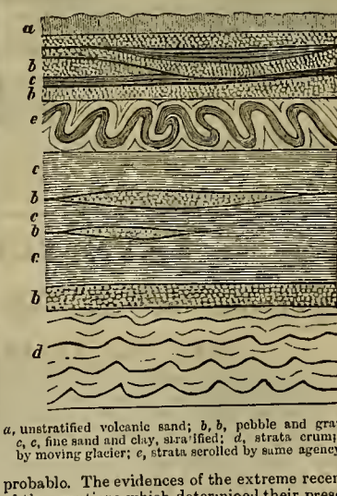
Fig. 2.

The material erupted by these volcanoes are, in some cases, basalt, but by far the largest amount consists of feldspathic elags, pumice and pumiceous sands and ashes. The whole plains of Mono are covered to a depth of many feet with a nearly white volcanic sand mingled with fragments of pumice and obsidian.

Age of the Mono Volcanoes.

There is abundant evidence that these volcanoes have been active, and, therefore, that they assumed their present forms since the epoch of great separate glaciers in this region (Champlain). Whether they also existed and erupted previously, is perhaps doubtful, though probable. The evidences of the extreme recency of the eruptions which determined their present forms are as follows:

Fig. 3.



a, unstratified volcanic sand; *b, b*, pebble and gravel; *c, c*, fine sand and clay, stratified; *d*, strata crumpled by moving glacier; *e*, strata scrolled by same agency.

1. We have already shown the splendid scale on which glaciers were once developed in this region. We have already given reasons for thinking that they ran down the Sierra, out on the plains and into the lake and produced icebergs there. It is impossible that the volcanic cones, if they then existed, could have escaped the powerful action of ice and the equally powerful action of other meteoric agencies, so characteristic of that epoch which must have entirely destroyed their form. The remarkable perfection of their conical forms and of their craters is, therefore, strongly presumptive, if not demonstrative, of the fact of their eruption since the disappearance of the glaciers.

2. All the streams which run from the Sierra into Lake Mono, cut into the level plains 100 to 150 feet deep. Fine sections of the materials of the plains are thus exposed. Fig. 3 is the upper portion of such a section about 80 feet perpendicular. The lower portion of the cliff, being covered up by talus, is not represented. It is seen that nearly the whole is an ordinary modified drift composed of irregularly stratified sands and clays, *cc*, intermingled with layers of pebbles and gravel, *bb*. But there are other parts that deserve more special notice. The stratum, *e*, is a fine light-colored clay through which runs a deep chocolate-brown lamina scrolled in the most complex and beautiful pattern. The strata, *d*, is also strongly crumpled. This crumpling and scrolling of the strata could have been produced only by a glacier advancing on a bed of stratified clay, or else by the pushing of icebergs on a stratified lake bottom. I suppose the whole formation, except *a*, to have been produced by an alternately advancing and retreating glacier, now retreating and dropping material to be carried and deposited by the rivers which flowed from its snout, now advancing and crumpling the finer material of the lake bottom. It may be difficult to explain the details of the process, but I think it will not be doubted that the whole is a distinctly marked drift deposit. Many other similar sections were observed; some of which were 150 feet thick.

Now covering, everywhere, this undoubted glacial material is found a layer of loose unstratified volcanic sand and pumice, *a*, which has evidently never been touched by the action of water. It is a pure eolian drift. In the section it is about three feet thick; but it is really much thicker, as it thins off on the margin of the perpendicular cliff by falling, and thus contributes to the talus at its base. It is evident that the whole material of the section was deposited during glacial times, except *a*, which has drifted over the bared lake bottom since that time. But judging from the immense quantity of this loose material, covering as it does the whole plain many feet deep, it seems impossible that it is the mere result of disintegration of the volcanic cones in recent times. I suppose, therefore, that it is the result of sand and ash eruptions since the recession of the lake waters.

3. We have already described the material of the largest island as being composed wholly, except a portion of the eastern part, of a fine infusorial earth, horizontally stratified with laminæ of slightly different colors, so thin as to give specimens an almost agate-like beauty. This material was evidently deposited in the middle and deepest part of the lake, beyond the reach of sediments, at a time when the place of the island was still a lake bottom. Now, that this occurred during or after the epoch of great glaciers, is demonstrated by the fact that scattered sparsely through the fine laminated material, and lying on its surface, having been washed out by erosion, I found many boulders, both worn and angular, of Sierra granite and slate, and also of obsidian. These could have been brought there only by the agency of floating ice, either as icebergs or as shore ice. If by icebergs, of course during the epoch of great glaciers; if by shore ice, either during that time or still later, for manifestly the boulders were brought down to the shore from the Sierra during that time. It is evident, therefore, that the stratified mud was formed and the boulders were dropped during the period of great glaciers or later. But still later the island itself was upheaved by volcanic action, as shown by the anticlinal position of the strata at the base and by the solfataric action still going on. The formation of this island I suppose to have been coincident with the last eruptions of the volcanoes on the plains.

4. Within the craters of several of the volcanic cones on the plains I found pebbles and angular fragments of granite of a peculiar reddish color, from the presence of a rose-colored feldspar. Whitney observed the same and accounts for them in the following manner: They could not, he thinks, have been brought by glaciers or by water, for this is inconsistent with the perfect shape of the cones. He rightly concludes, therefore, that they must have been ejected from the volcanoes. But if so, he says: "They must have been torn off from the underlying granite, through which the eruptive matter has forced its way, as is seen everywhere in the Sierra."* On the contrary, I account for them in a wholly different way: The fragments which I saw were some of them angular it is true, but most of them were well worn pebbles. There is not the slightest doubt that these were pebbles of the drift layer, which everywhere underlies the loose sand of the plains. The eruptive forces broke through this drift layer and the ejected pebbles fell back into the crater. They demonstrate that the cones and craters, where they are found, not only erupted, but were wholly formed after the epoch of the pebble drift.

I think, therefore, there can be no doubt that all of these volcanoes erupted, and many of them were wholly formed, after the epoch of great glaciers (champlain). Whether any of them preceded that epoch is doubtful. I have never seen any undoubted evidence that they did. If the boulders found in the island were carried there by icebergs, then volcanic action preceded the epoch of icebergs, for many of the fragments are volcanic; but they may have been carried by shore ice at a later time. Again: I believe the rocky part of the island is older than its sedimentary part; for the latter seems to have been deposited on the former. If the sedimentation was champlain, then the rocky part was probably pre-glacial; but the sedimentation may have been later.

Sequence of Events.

Assuming that the island strata belong to the epoch of great glaciers, then the order of events was something like this:

1. Volcanic eruptions on the plains producing obsidian, fragments of which were afterwards carried by ice and dropped in mid-lake. At the

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* *American Journal*, Series III., Vol. V., p. 325, 1873. Vol. X., p. 126, 1875. Vol. XVI., p. 95, 1878.

† *American Journal*, IV., p. 325.

‡ Geological Exploration of 40th parallel Vol., I., p. 508.

* Geological Survey of California, Vol. I., p. 458.

* Geol. Survey of Cal., Vol. I., p. 455.

[Continued on Page 276.]

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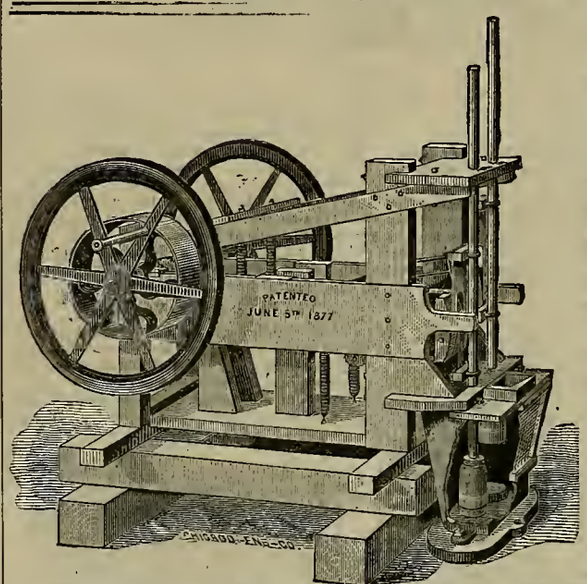

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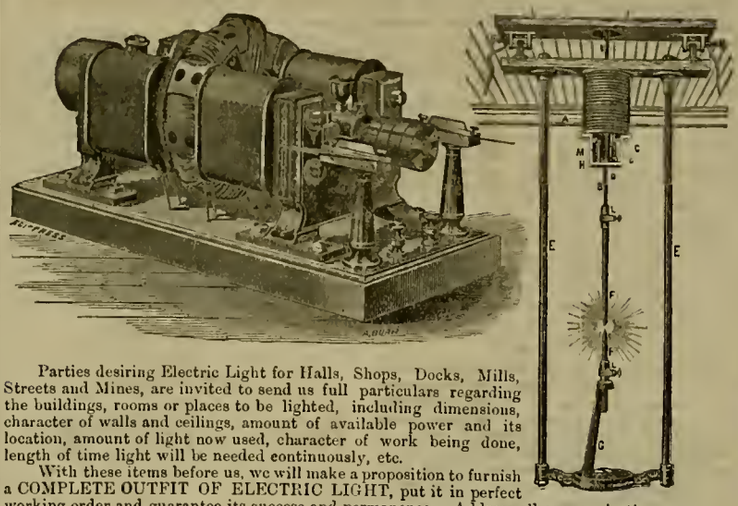

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San Lorenzo, December 6th, 1877.

Messrs. Dewey & Co.—*Gentlemen:* I received the Letters Patent for my invention on the 6th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully, Wm. Dale.

[Continued from page 269.]

in to handle the influx of water. The drift north on the 2000 level is making six ft per day in a favorable vein formation, through which seeps a little water. A drift has been started south from the Sierra Nevada winze, 2300 level, toward the Ophir incline. It is making three ft per day.

JUSTICE.—The south lateral drift, 1550 level, continues to cut favorable vein matter, containing ore in places. The upper workings in the Waller Defeat ground are continued as usual and some ore is being extracted. Some high-grade ore has recently been encountered in these workings, and the outlook there is very favorable.

CALIFORNIA.—All the work being done in developing the mine is joint with Con. Virginia. The west drift, 850 level, is in porphyry, the face 60 ft from the Con. Virginia shaft. The west drift, 2150 level, is in 440 ft in fine vein matter. Sinking at the C. & C. shaft is being continued at the rate of three ft per day for a sump.

SILVER HILL.—The drift south from the Waller Defeat workings has been turned toward the east somewhat and shows unmistakable signs of cutting the vein and encountering pay ore. The ledge in this mine has been found to be 600 ft wide. There are places where it shows signs of contracting.

OPHIR.—The improvement in the stopes on the 6th floor above the 2000 level going south continues, and the vein is now over 10 ft wide, and swinging around toward the west. The ore is of excellent quality. The joint Mexican upraise, 2100 level, is making two ft per day, and will reach the 2000 level in a short time and greatly improve ventilation.

GOULD & CURRY.—The bulkheads on the 1800 and 1900 levels have been completed. The joint east drift, 1700 level, is being pushed at the rate of four ft per day in a mixture of clay and porphyry, carrying some water. The bottom of the shaft is now kept freed from water, ready for the resumption of sinking.

JULIA CON.—The 2000 level has been freed of water, but the heat is so great that but little can be accomplished toward cleaning it up and repairing it. Some 50 or 60 ft of double drift are found to be badly caved, the timbers being broken. The flow of water from the mine is now 11 miners' inches. It will decrease to seven inches.

MEXICAN.—The joint Union upraise from the 2000 level is making three ft per day in a vein formation carrying some water. The joint Ophir upraise from the 2100 level will soon connect with the 2000 level north drift and greatly improve ventilation.

SUTRO TUNNEL.—Six hundred men are employed in and about the construction of the sub-drain of the tunnel, and the work is making good progress. There has not yet been an agreement as to terms for raising debris at the Comstock end.

WARD.—Sinking, the shaft being down 1,880 ft. The flow of water continues strong, but is rapidly decreasing.

YELLOW JACKET.—Owing to breaking of a spur wheel, nothing is being done on the 2400 level of the old workings at present. Sinking at the new shaft is going on as usual and making rapid progress. Total depth, 2,445 ft.

BULLION.—The crossent east, 2150 level, is averaging five ft per day, and is in 152 ft from the lateral drift. It is still cutting clay, porphyry and quartz.

NORTH BONANZA AND FLOWERY.—The new engine is ready for use. Some more water has been encountered on the second level, but the flow is rapidly decreasing, showing it to be only a reservoir which has been tapped.

NORTH CON. VIRGINIA.—One of the long-looked-for cables has arrived and has been attached to the big engine. The repairs to the shaft will probably be completed during the current week.

CON. IMPERIAL.—The south drift, 2600 level, is connected with the old workings, 2400 level, of the Yellow Jacket, and an improved ventilation has commenced.

ALTA.—The joint three-compartment incline winze is rapidly approaching the 1750 level, which it will reach by the last of the week. The drift north, 1550 level, is being continued.

UTAH.—The main incline is now making excellent progress, the bottom 435 ft below the 1350 level. The new engines give the best of satisfaction.

BEST & BELCHER.—The joint east drift, 1700 level, has its face 790 ft east of the lateral drift, and in a mixture of clay and porphyry.

ANDES.—The west cross drift, 350 level, has passed through eight ft of hard rock, but is again in a mixture of clay, porphyry and quartz, without any sign of the west wall.

CROWN POINT.—Crosscutting on the 2500 level in two places. No. 1 is joint with Belcher, and No. 2 is 127 ft further north. The latter is in 50 ft, but neither crosscut is in the ledge yet.

EXCHEQUER.—Three ft per day are being added to the length of the north drift, 2400 level; total length, 375 ft. Its face is still in soft vein porphyry carrying stringers of quartz and some water.

OVERMAN.—Still running north on the 1600 level and sinking the winze below that level. No change of formation to note. The O & C shaft has reached the 600 level and is going on down.

EUREKA DISTRICT.

RICH MINE.—*Sentinel*, April 21: The Silver Gate is owned by Mr. D. J. J. McLaughlin, of Ruby Hill, and has been worked by him at intervals for several years. There is an incline down about 120 ft. The ledge is well defined and the walls perfect. It is estimated that there are 30 tons of ore on the dump. About five tons of it is recognized as first-class, and this will work $300 per ton. The balance is counted on as being good for $250 to $400 per ton. Mr. McLaughlin will ship the second-class ore in a few days to the Richmond for reduction. The mine is holding out splendidly as far as work has progressed, and the indications are good that the ledge will continue down indefinitely. Considerable high-grade ore has been left behind on either side of the incline.

COLORADO.

LEADVILLE.—Cor. Denver *Tribune*, April 16: The past week has been prolific in big strikes. At least half a dozen new developments have been made, some of which promise exceedingly well. Most of these are in the new region known as "Evans." There are three gulches to the north and east of Leadville, known as Big Evans, Little Evans, and South Evans. These gulches lie between the lower ranges of hills that skirt Bald mountain, and it is upon these hills that the new prospects have been opened up. But few holes were worked in this new locality previous to January, so that but little was known of the character of the country. Active prospecting has been carried on since that time, and it is now definitely ascertained that large bodies of the best mineral, similar in character and equal in value to the Fryer hill discoveries, exist all along that region. As yet, however, none of the newly-discovered holes have been worked sufficiently to demonstrate the extent of the deposit. In many of the new holes the indications are as good as any about Leadville. Scarcely a foot of land can be found there now that is not covered by a miner's claim. Some of these new finds are held at high figures, while others can be purchased at moderate prices. Among those in which mineral has been found in fair quantities are the Sarsfield, Little Katie, Little Morgan, Flower of Edinburgh, Little Bonanza, and Yaukee Boy. The first of these has been offered for $35,000, and is believed to be well worth the price asked. Some excellent prospect holes in which mineral has not been reached, but where there are first-class indications, lie all along these gulches, and no doubt rich returns will be reaped from them during the next 30 days. The George Washington, Mollie, Emma, Little Maud No. 2, Mountain Queen, and Olivia are among the most promising. Most of these shafts are sunk from 40 to 65 ft, the lower ones having the best indications of being near paying mineral. Probably 200 men have started out to prospect within the last 10 days, a large majority of whom have located their claims in the last mentioned region. Some have gone to Ten Mile and Kokomo, and still others to Eagle river, about 20 miles to the west of Ten Mile. The last named locality is spoken of very highly by parties who were in there during the latter part of last season, and considerable interest is being manifested among old prospectors, who are leaving for the new section by every stage.

Relation of the Mono Volcanoes to the Glacial Drift.

Continued from page 273.

same time also, the basaltic part of the island was formed.

2. Then followed the period of great glaciers and flooded lakes or champlain epoch. The lake was near 700 feet higher than now. Its waters covered the whole plains and washed against the Sierra; and glaciers from this range ran far into the lake and formed icebergs, which floated on its surface and dropped rock fragments on its fine mud bottom.

3. Volcanic forces acting quietly like the solfataros and fumaroles still existing, heaved up the stratified mud bottom of the mid-lake into a gentle mound with quaqua versal dip of the strata, but not rising to the surface. Coincident with this were the eruptions of the plain's volcanoes.

4. The lake then dried away gradually to its present level, leaving the terraces as its old flood marks and exposing the rounded mud island; and erosive agents then sculptured this to its present turreted form, and cut away its margin to its present limits and exposed the mud-covered, older basaltic part.

Lake Rising Again.

The existence of salt and alkaline lakes show an extreme dryness of climate; but the climate of the desert region has not always been dry. During the champlain epoch, the interior plains were covered with immense sheets of water, of which the present saline lakes are the isolated residues. Gilbert has shown that at that time Great Salt lake contained 400 times as much water as now, and that it drained northward through the Snake and Columbia rivers into the Pacific ocean. King has shown that the Nevada basin was at the same time occupied by a vast, irregular sheet of nearly equal extent stretching southward as far as Columbus, Nevada. Pyramid, Winnemucca, Carson, Humboldt and Walker lakes are the concentrated residues of this great lake. Lake Mono also, we have seen, at the same time, was a great sheet of water, whether connected with the other or not is not known. There has been, therefore, an increasing dryness of climate in that region since the champlain. Is it still progressing, or has it reached its maximum? An important question for the Pacific States.

From my observations on Lake Mono, I have no doubt that its level at the time of my visit was rising, and had been rising for 10 or 15 years. The evidence is as follows: Around the margins of the lake I found everywhere old fences of sheep corrals and old trails submerged many feet deep. While visiting the island I found the vegetation of the island, sage brush (*Artemesia tridentata*) and grease wood (*Sarcobatus vermiculatus*), submerged in eight feet of water, and of course killed. Residents about the lake state that the waters have risen 10 or 12 feet in 10 or 15 years. I might be disposed to doubt these observations if the same phenomena had not been observed in other lakes in the same dry region. Salt lake is known to have risen 14 feet in 25 years and submerged large tracts on its flat margins, and the water, by analysis, is far less salt than formerly. Pyramid lake, according to King, has risen nine feet, and Winnemucca lake 22 feet in only four years (1867-1871). The same is said to be true of Walker lake and of Owen lake.

The cause of this is evidently increase of rainfall and snowfall, chiefly the latter. In this connection it may be well to mention an additional evidence of increasing snowfall in the Sierra. I have in a previous paper† drawn attention to a moving snow-field, or rather an imperfect *glacier*, occupying the great cirque at the top of Mt. Lyell—the feeble remnant of the great Tuolumne glacier of glacial times. At the foot of this *glacieret* there is as perfect a terminal moraine as ever was seen. It is a crescentic pile of rock fragments 20 feet high, 50 feet wide at base and about a mile long. The fragments were brought down by the moving ice from the vertical cliffs of the cirque. Many similar fragments are seen lying on the glacier on their way to the moraine, and in various stages of advance. Now not only does this moraine show no signs of being left by a *retreating* glacier, but on the contrary I think it shows signs that the ice is *advancing*. For the snout of the glacieret is not only pressed hard against the moraine, but the outer slope of the moraine, when I saw it, 1872, was just at the *limit of stability*—the least disturbance caused the fragments to roll down. It would seem therefore that the moraine is being pushed slowly forward. Whether the same is true still I know not.*

King, in his recent volume on systematic geology already referred to, has drawn attention to still another evidence of snow advance in the high Sierra. According to him, above the timber belt, there is a comparatively bare region of 1,000 feet vertical, on which for ages there has been too much winter snow to allow the growth of timber. In the timber region bordering the bare region there are many trees which have 250 annual rings. These trees have therefore been growing securely for 250 years. But since 1860 the snow has so far advanced upon the timber region that these great trees are being destroyed by avalanches. It would seem, therefore, that not only has there been recent advance, but that it is the first advance for 250 years.

The rise of the lakes in the desert region is therefore undoubtedly the result of a climatic cycle. But whether the cycle be a long or a short one; whether it be a geological cycle of increasing snowfall—a turn of the cycle of dryness which, commencing after the champlain epoch, culminated in the present arid condition of the desert region; or whether it be only a climatic fluctuation of short duration, and of which therefore geology takes no account—such for instance as may be supposed to be connected with the sun-spot cycle, it is impossible with certainty to determine without observations extending through much longer periods of time. I have hitherto been disposed to think the latter more probable, but King's observations on destruction of trees by avalanches would seem to point to the probability of a long cycle.

Berkeley, Cal., March 1st, 1879.

† *American Journal*, 3d Series, Vol. V., p. 325.

* King in his recent volume on "Systematic Geology of the 40th Parallel," p. 477, says that all Mr. Muir's living glaciers of the Sierra are only moving snow-fields well known to the California surveyors. He then quotes Agassiz defining the distinction between such moving neves or snowfields and true glaciers. This distinction according to Agassiz, consists in the ability to bear rock fragments on its bosom and thus form a moraine. Now it is but justice to Mr. Muir to say that the ice in the Lyell cirque does bear large rock fragments on its surface, and accumulates them at its lower limit as a perfect terminal moraine. Recognizing, however, the fact that this ice mass does not emerge from its native cirque, I have, in my paper on "Ancient Glaciers of the Sierra" (*American Journal*, Vol. V., p. 325,) called it a *glacieret*.

News in Brief.

EARTHQUAKE at Costa Rica on the 17th.

BLACK bass are running at Port Townsend.

FROSTS are damaging fruit in Mendocino Co.

TEXAS boasts of 20 murders during the last month.

HAWAII is importing trotting stock from America.

THE last of the escaped Cheyennes has been captured.

FIGHTING continues in Zulu land with varying success.

AMERICAN firms are exporting axes and hatchets to Mexico.

MINERS are flocking into Leadville, Col., at the rate of 800 a week.

EUREKA, Nev., has been one-third destroyed by fire. Loss $1,000,000.

IN three years the production of beet sugar in Austria has been doubled.

THE South proposes to fill the places of emigrating blacks with Chinese.

Two tidal waves were perceptible all along the Atlantic coast on the 18th.

THE weather is very dry in Arizona, and crops will fail unless rain falls soon.

THE Associated Bankers offer to take the whole of the refunding certificates.

THE Warm Spring Apaches have escaped from their reservation, and are now on a raid.

THE steamer *Great Republic*, has gone ashore off the coast of Oregon, and is a complete loss.

MANY of the striking miners in England are emigrating to the United States and the Colonies.

A FIRE-DAMP explosion lately killed eleven men at the Wellington coal mine, Vancouver Island.

THE North Pacific has secured a loan of $2,000,000, and will push its road to the Yellowstone.

THE man who attempted to kill the Czar, is to be tried by the highest criminal tribunal in Russia.

NEAR Chico, a party of Chinamen were recently fired on by white men, and two of them killed.

HUNDREDS of tons of iron passes over the Central Pacific daily for the Southern Pacific in Arizona.

A NEGRO prisoner was taken from the officers at Washington Junction, Md., lately, by a mob, and hanged.

AN enormons meeting of miners near Hetton collieries, England, unanimously resolved in favor of arbitration.

SCHULTZ, charged with embezzlement in San Francisco, has been released on filing bonds in the sum of $360,000.

OLIVE AND FISHER, the Nebraska man-burners, have been sentenced to imprisonment for life with hard labor.

DR. CHALFANT, the man who killed Bacon at the Baldwin Hotel, pleads guilty and claims the killing accidental.

THE largest revenue seizure ever made in the State, has been made in San Benito county—Culp & Co.'s cigar factory.

MAJ. E. H. CAMERON, of the Royal artillery, has patented an invention whereby matches can be rendered waterproof.

THE Mutton and Wool Growers' Protective Association, recently organized at Lower Lake, pay $25 in coin for coyote scalps.

O'NIEL, the actor, has been found guilty of violating the "sacrilegious play" ordinance in personating Jesus Christ, and fined $200.

THE distress in Morroco from famine is so great that mothers are eating their children, and hundreds of deaths are occurring daily.

BY an explosion of fire-damp in a coal pit near Mons, Belgium, setting fire to the woodwork of the shaft, 240 men, miners, are shut in.

THE Bruckner pulverizing mill (new pattern) will be in operation on Monday, April 28th, at 2 P. M., on Berry street, between Fourth and Fifth, near the San Jose depot. All mining men interested in crushing machinery will do well to call and see this machine in operation. One day last week it ground some hard white quartz, though a No. 35 screen, at the rate of 1,500 pounds an hour.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING MARCH 25TH, 1879.

213,508.—WAGON—F. A. Hill, San Leandro, Cal.
213,659.—PARASOL—Mrs. H. E. Israel, Bantas, Cal.
213,527.—AMALGAMATING QUARTZ MILL—A. B. Paul, S. F.

FOR THE WEEK ENDING APRIL 15TH, 1879.

214,278.—METALLIC LATHE—Chas. H. Carter, S. F.
214,285.—STEAM BOILER—Riley R. Doan, Sacramento.
214,302.—STENCH TRAP—Wm. E. Lane, S. F.
214,319.—FARM GATE—E. L. Rugg, Capay.
214,321.—AIR VALVE—J. M. Scott, S. F.
214,415.—OAT SEPARATORS—Jas. Magone, Canyon City, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Boston Money and Mariposa Mines.

A Boston company has just purchased the Baltimore quartz mine—sometimes called No. 9—situated near Hornitos, Mariposa county. This property was formerly owned by a small company of miners who had been working it in a limited way, extracting and milling a few tons of ore daily. The present owners will at once erect a 20-stamp mill and proceed to open up the lode, which is large and well-formed, in a thorough and systematic way. The ore is free milling and of fair grade, assaying from $10 to $12 per ton, and it is expected that it will yield under the stamps from $8 to $10. The cost of mining and milling is estimated at $3.50 per ton. There is a good body of ore already exposed in the mine, and little fear is entertained but there will be a sufficiency to keep the new mill steadily and profitably employed. This claim lies in a good neighborhood, being near the Washington and other productive mines, some of which have been worked with handsome profit for years. Into the new mill, which will be run by a combination of steam and water, there will be introduced every method and device calculated to economize expenses and insure a close working of the ore. This property was bought on the recommendation of J. S. Phillips of this city, who will exercise a general supervision over it hereafter. This gentleman has so far been fortunate in making choice of mining properties for Eastern investors, and it is to be hoped results will prove that his judgment has not been at fault in the present selection.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Martin White, April 13th, $8,089 78; Northern Belle, April 12th, $4,241.03; Highbridge, April 15th, $4,700; Hillside, April 16th, $4,900; Alexander, April 18th, $8,565 85; Con. Virginia, April 19th, $25,613.62; Calfornia, April 19th, $50,650.86; Northern Belle, April 16th, $3,257.41; Hillside, April 20th, $5,300; Martin White, April 16th, $6,250; Grand Prize, April 21st, $12,500; Indepeudence, April 21st, $5,700; Paradise Valley, April 18th, $5,204.34; Christy, April 21st, $6,208.

THE Stevenot Fine Gold amalgamator which we recently illustrated, has been running in this city this week, so that those interested might see it at work. The machine is very simple in construction and operation, and costs $150, a great deal less than any in the market. It may be used in connection with stamps or crushers, and is well adapted for tailings also. Several of these machines are now being made here for California mines.

AN ENGINEER, favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design stationary, marine, locomotive, mill work, sugar and hydraulic machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

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METALS.

(WHOLESALE.

WEDNESDAY M., April 23, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @ —
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 20@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, April 23, 3 P. M.

SILVER 1¼@1¼.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 88@89.

LONDON Consols, 99 1-16; Bonds, 103.

QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending April 22, 1879.

HIGHEST AND LOWEST BAROMETER.

Apr 16	Apr 17	Apr 18	Apr 19	Apr 20	Apr 21	Apr 22
30.277	30.153	29.866	29.965	30.330	30.213	30.157
30.188	29.916	29.811	29.864	30.031	30.191	30.044

MAXIMUM AND MINIMUM THERMOMETER.

63.5	69.7	65.5	65.5	56.2	63.3	68.5
50.3	50.5	50.5	50.5	47	47.5	51

MEAN DAILY HUMIDITY.

71.3	61.7	68.6	68.3	64.6	57	65.6

PREVAILING WIND.

W	W	W	SW	NW	NW	W

WIND—MILES TRAVELED.

152	171	118	221	345	284	130

STATE OF WEATHER.

Clear.	Clear.	Cloudy	Fair.	Clear	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

		.01	.26	.52		

Total rain during the season, from July 1, 1878, 22.04 in.

Mining and Scientific Press Patent Agency.

PATENTS obtained promptly; Caveats filed expeditiously. Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons, and our success and business are constantly increasing.

The ablest and most experienced inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

DEWEY & CO., Patent Agents,

Office—202 Sansome St., N. E. Cor. Pine, S. F.

A. T. DEWEY. W. B. EWER. O. H. STROND.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Mount Jefferson Milling and Mining Company.

—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Directors held on the 21st day of March, 1879, an assessment (No. 6) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the Company, Room 6, No. 318 Pine street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 2d day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 27th day of May, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

California and Oregon Land Company.

—Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 2) levied on the first day of March, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Allen, J O	130	400	$160 00
Pond, E B	129	50	20 00
Woodsum, O P	106	100	40 00
Woodsum, O P	107	100	40 00
Woodsum, O P	108	100	40 00
Woodsum, O P	109	100	40 00

And in accordance with law, and an order of the Board of Directors, made on the first day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Saturday, the tenth day of May, A. D., 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of Works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Directors, held on the tenth day of April, A. D., 1879, an assessment (No. 41), of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, in the Secretary at the office of the company.

Any stock upon which this assessment shall remain unpaid on the twelfth day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the tenth day of June, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco, Cal.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7), levied on the 4th day of February, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	38	700	35 00
Edwards, J E	39	700	35 00
Gautier, Gustave	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	200	200	10 00
Lehmann, C, Trustee	207	200	10 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

POSTPONEMENT.—The sale of delinquent stock of the above named Company is hereby postponed until Tuesday, the Sixth day of May, 1879, at the same hour and place. By order of the Board of Directors.

R. N VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

Mines and Works of Almaden.

Translated from "Annales des Mines"

By S. B. CHRISTY.

Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc 48 pages octavo—paper cover—price (postpaid) 50 Cts. Published and sold by DEWEY & CO., 202 Sansome Street, S. F.

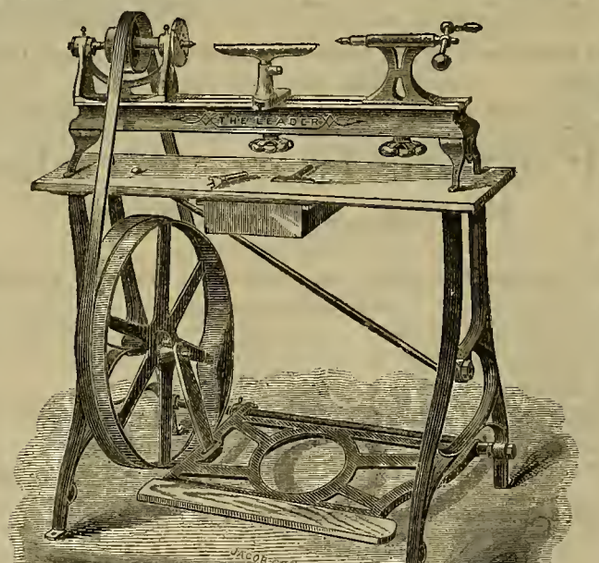
Mill and Mining Machinery Of All Kinds For Sale by BERRY & PLACE

At the Old Stand, Market, head of Front Street, S. F.

Dunham, Carrigan & Co.,

Nos. 107, 109 & 111 Front Street, S. F.

Lathe Without Saw Attachments.

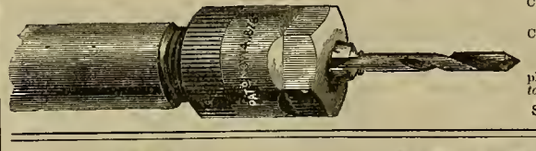


This Lathe has been made especially to meet a want felt by many for a really good and substantially made Foot Lathe at a reasonable price, and we think that we can safely say that it is by far the best Lathe ever placed on the market at the price asked. The bed, head and tail stocks are of iron; the spindles of steel. The bearings of the head stock is conical, so that the wear can be easily taken up.

Material eighteen inch s long and eight inches in diameter can be turned on it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face-plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
Price of Lathe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.



Chuck, for drills ¼ and under, Price.....$1.50

Chuck, for drills ½ and under, Price.....$2 25

They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*

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LOWEST PRICES,

EASIEST TERMS OF PAYMENT,

MOST RELIABLE INSTRUMENTS. Old Pianos taken as first payment for new. All Instruments fully warranted. Tuning and Repairing. Pianos at Wholesale.

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Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

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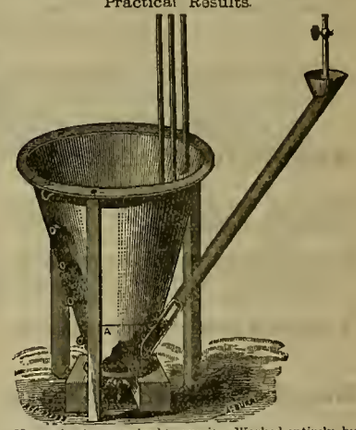
STEVENOT'S Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.



No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

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BRASS CASTINGS of all kinds,
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AT LOWEST RATES.

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Marine, Stationary and Portable Boilers, Smoks Stacks, Hydraulic Pipe, Oil or Water Tanks, Ors and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

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Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

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ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipss and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

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STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horss power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sals at the lowest prices by

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MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

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Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
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AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
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TRY OUR MAKE, CHEAPEST AND BEST IN USE.

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IMPROVED PORTABLE HOISTING ENGINES,

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Car and Locomotive Axles and Frames, and Hammered Iron of Every Description.

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Propeller Engines either High Pressurs or Compound Stern or Side Wheel Engines.

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Hoisting Engines and Works, Cages, Ors Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

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Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordanes with the Act of Congress regulating ths sams, or for uss on land. Water Pipe, Pump or Air Column, Fisb Tauks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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ENGINES, BOILERS, MARINE AND STATIONARY. PUMPING, HOISTING, AND MINING MACHINERY INCLUDING BATTERIES, AMALGAMATING PANS AND SETTLERS, CONCENTRATORS, ORE FEEDERS, CRUSHING ROLLS AND ROCK BREAKERT. ALSO, WATER JACKET SMELTING FURNACES, FOR REDUCING LEAD, SILVER AND COPPER ORES, QUICKSILVER FURNACES, RETORTS AND CONDENSERS, ROASTING AND CHLORIDIZING FURNACES, SUGAR MILL MACHINERY, WATER WHEELS, ETC., ALL OF THE LATEST AND MOST IMPROVED CONSTRUCTION.

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HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

ORDINARY ENGINES compounded when advisable.

STEAM LAUNCHES, Barges and Steam Tuge constructed with referenec to the Trade in which they ars to be employed. Speed, tonnage and draft of water guaranteed.

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Inventors and others can get Firet-Clase Work at Moderate Prices.

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Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

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Double C. Reversible. 5½x12, 6x12, 7x12, 8x12, 9x14, 10x14

ALL SIZES **Hoisting Engines** FOR SALE BY BERRY & PLACE

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One now paying mors than expenses. Addree

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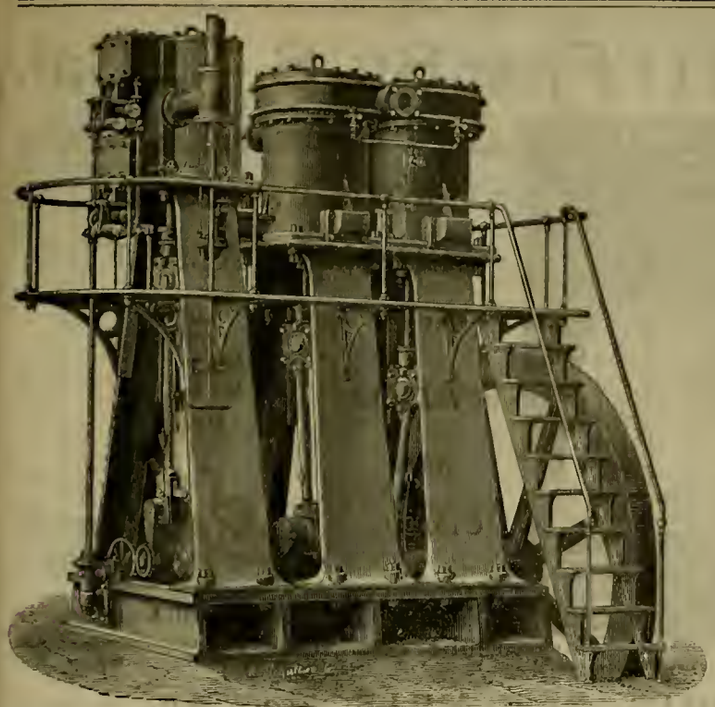

With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

PARKE & LACY,

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

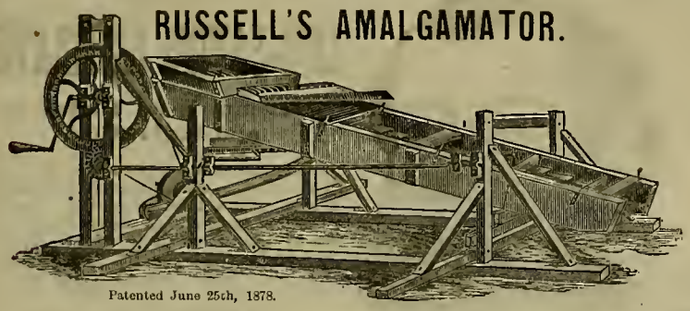
Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

RUSSELL'S AMALGAMATOR.



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The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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Safety Cap,

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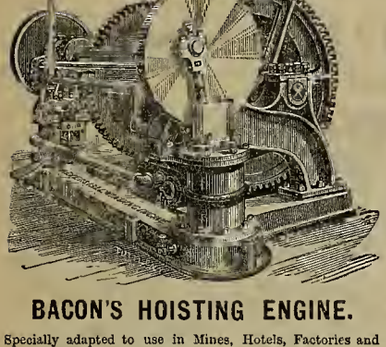

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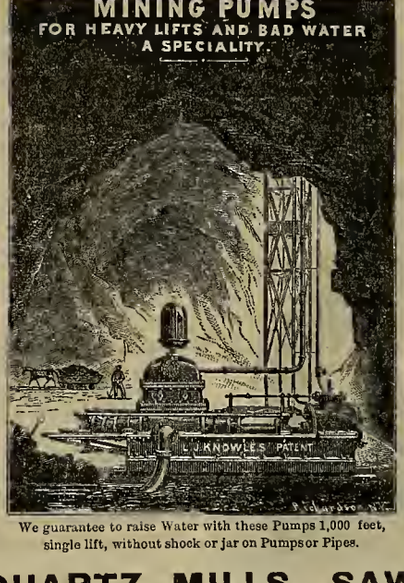

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MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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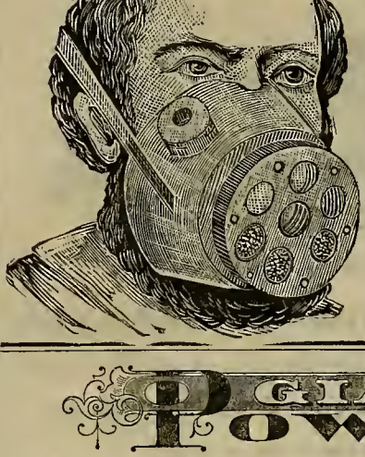

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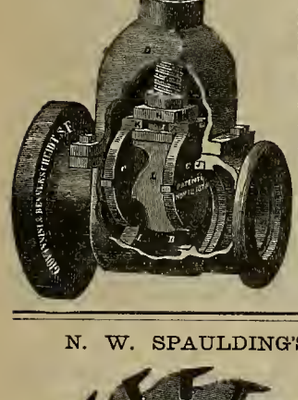

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The attention of our customers and especially of those interested in Water Works, Gas Works or Mines is respectfully called to our very important improvement in the construction of Stop Valves (or Gates). They differ from all others in that the inner faces are perfectly parallel, therefore when the Gate or Valve is to be opened, at the first movement of the screw the center block (see cut) releases the disks from their bearings, so that they will move easily and prevent the wearing of the inner faces.

This Gate has proved very efficient in Pipes of all sizes, and under any pressure and from its double form and perfect joint formation is especially valuable for use in large Pipes for water, steam and gas, and from its avoidance of any wedge shape cannot jam at any point (see cut).

The **G. & B. Valves** (or Gates) have no equal in simplicity of construction of all working parts, ease of access for repairs, and durability.

We have recently enlarged and fitted up our Brass Foundry and Shop with all the latest improved Tools and Machinery, thus greatly increasing our facilities for rapidly executing orders for all sizes of Stop Valves (or Gates) from three-inch to four feet in diameter, or any size, to order. We guarantee them to give better satisfaction, cost less money, and last longer than any other Valve in use.

We are also prepared to execute all orders in Brass Work for Breweries, Distilleries, Plumbers, Gas and Mining Apparatus, Ship Work, Soda Apparatus, Steam Fittings, Meters, Gauges and Indicators. Also in Machine Pattern and Model Making, and Clock Work. Gear cut to order. Brass Castings of all kinds. We are confident of our ability, and all orders entrusted to us will be executed with promptness and dispatch.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 3, 1879.

VOLUME XXXVIII Number 18.

Wenzell's Pneumatic Clock System.

The question of time is as old as the human race, and as time has progressed the methods and instruments to measure time have been improved. To the savage, the natural division of time by the rolling seasons and rising and setting of the sun, were, for his simple wants, all-sufficient; but with the progress of civilization the necessity of more accurate division of the day was indispensable. The sun dial and the first mechanical contrivance by means of the Clepsydra, or water clock, as also the sand glass and candle clock, were among the first devices to obtain time.

Although the art of clock making has reached such perfection at the present day, that in clocks of the best construction—the variation between the recorded and absolute time will be only a few seconds during the entire year—yet the principle of construction remains the same as in the days of Galileo. A weight continues to be used for obtaining an uniform motive power, and the long pendulum is indispensable for the accurate measurement of the fleeting hours.

These conditions of movements being absolutely necessary, it is impossible to manufacture the motive and regulating power of an accurate time-piece of a shape or size at all adapted for the requirements of a modern dwelling house; and so a substitute has been found in the handsome mantel and other varieties of fancy clocks, but all more or less unreliable as time keepers—requiring a great deal of attention; and, when several clocks are in the house, frequently the cause of considerable inconvenience and dissatisfaction from it being impossible to tell which clock is right.

A good many attempts have been made to obtain an uniform system of time registration by all the clocks in one house, and even of all the public clocks of a city. The electric clock was introduced by Wheatstone as far back as 1840, and promising results were accomplished, but their practical application has not been a success, being unreliable as time keepers.

A California inventor, Mr. Hermann J. Wenzell, finally accomplished the long-sought object by devising a simple and unfailing means of obtaining uniformity of time, and one which the experience of several years has proved practical and accurate. The system is so reliable in its action and comprehensive in its scope that the number of clock faces upon which it is capable of showing precisely the same time, as that indicated by the regulator, is practically unlimited.

The Wenzell Pneumatic or air clocks are now recognized as the best for the purposes indicated. The two essential parts in the construction of a good clock are the pendulum and weight, which are still used by watchmakers as regulators, and for scientific purposes. The ornamental spring mantel clock has taken the place of the old reliable family clock in our parlors, and a very cheap one has been placed in the kitchen; but as both are being run by a spring which, as it is wound up or run down, gives an unequal power, a spring clock is not as good and reliable a time-keeper as the old grandfather's clock.

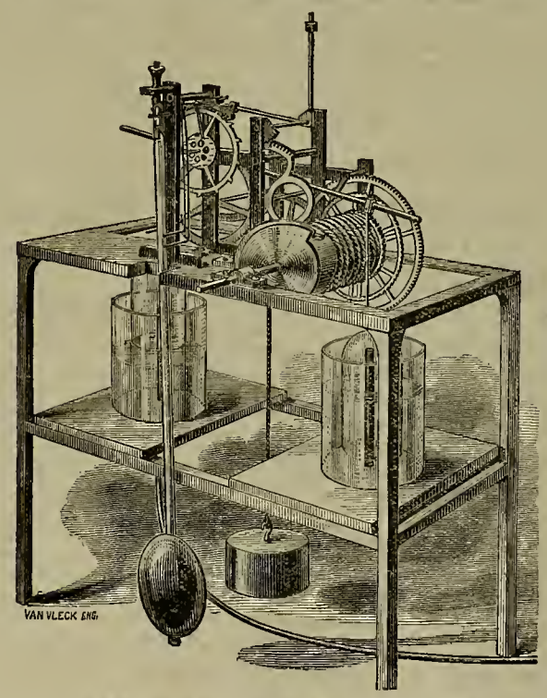
In the construction of a regulator for running clocks by air pressure, the inventor has made use of the advantages of the old principle, and so that his system can be adapted to clocks of any design. This regulator is shown in the engraving on this page.

The prominent features of the invention may be summarized as follows: In any convenient portion of a building is placed a regulator, which is connected with two simple air pumps worked by wheel-work. Attached to these pumps is a pipe, similar to a small gaspipe, with connecting branches. These pipes can be conducted to any number of buildings, and to the rooms where a clock-face is required to be shown. They can be introduced into an ordinary mantel clock mounting, and the costly but frequently useless works contained therein be substituted by a simple face, and silent motion communicated to the hands by the pulsations of the air pumps of the regulator working unceasingly and infallibly perhaps far away in some dark closet.

The great advantage of this system of clock propulsion is this: That time can be distributed and accurately recorded all over a house, or a city, with as much facility and certainty as gas or water, and no matter how numerous the clock-faces may be, it is the regulator alone that requires winding once a week, and as a consequence every other face will show the same time, to a second, without any attention whatever.

Should the winding of the regulator be neglected, it begins to strike a bell for the last 24 hours, calling for attention.

These clock-faces can be introduced in a mirror, in a picture frame, on the wall, on the mantel of a room, or over a door, or suspended like a chandelier, where it would be inconvenient or impossible to keep ordinary clockwork going. The clock-faces, having no works, make no ticking noise. They can be made transparent to show the time at night, and to strike the hours. There is no overwinding,



WENZELL'S REGULATOR FOR AIR CLOCKS.

breaking of springs, or use of keys, and in fact no repairs. It may here be stated, that the electrical clocks at the New City Hall have by no means given satisfaction, and the Commissioners have adopted Wenzell's Air Clock for the unfinished portion of the building. After a most thorough examination from a scientific point of view the St. Ignatius College has also concluded to introduce the clocks in the new building on Hayes street and Van Ness avenue. In the palatial residence of Mrs. Hopkins no less than 35 clocks, each of a different design, have been put up. They are also in use at the Nevada Block, the Baldwin Hotel, London and San Francisco Bank, San Francisco Verein, Real Estate Associates Building, German Hospital, etc. Practical working for several years in these and other buildings, prove that this pneumatic clock system furnishes correct and uniform time for public or private buildings. They have been also introduced in Vienna and Paris and numbers in Europe. These clocks and regulator may be examined in detail at the office and manufactory of the inventor, No. 328 Kearny St., in this city.

TRACK on the Southern Pacific is now laid half a mile east of Moricopa wells, and regular trains will be running to that point next Monday.

Assaying at the University.

Some time ago we published a short account of the College of Mines of the University of California, and called attention to the importance of the work of education it was doing on this coast. We have now to add that the intention then expressed, of adding to the theoretical instruction received, a practical course in all branches of assaying, has been successfully carried out, and that the students are now actually at work in the metallurgical laboratory fitted up for that purpose. It was hoped to commence the present course in the large laboratories of the new Mechanics-Mines building, but it was found impossible to set up the apparatus lately brought from Germany in time to permit of its use by the present senior class. Therefore the experimental laboratory has been pressed into service, and will continue in use the remainder of the term. Still, this building is fully as commodious and provides fully equal facilities to those found in the average city assay offices. The building is divided into three apartments. First, a room for analysis, wet assaying, mixing and weighing, which is furnished with an extensive and varied assortment of crucibles, scorifiers, glass ware and other apparatus used in assaying; second, the weighing room, which contains besides the usual balances, an Oestling and a Becker balance; third, the furnace room, containing a medium sized French muffle furnace which will accomodate eight scorifiere, a small-sized muffle furnace and two crucible furnaces. The class is primarily instructed in the work by Prof. Becker. They then put the theory into actual practice under the immediate supervision of Mr. Dwight Huntley, who has had an extensive experience in assaying both in San Francisco and Nevada, and is therefore eminently fitted for the position of instructor.

The importance of a School of Mines on this coast makes this subject peculiarly interesting, for it is an assurance that the college is the right thing in the right place. It is not wholly theoretical nor yet wholly practical. It is demonstrably a combination of both theory and practice, and therefore essentially fitted for turning out competent and efficient mining engineers.

The Leadville Mines.

Remarkable as the mineral deposits about Leadville unquestionably are, some very grave difficulties and drawbacks seem likely to develop themselves as the work of exploration and ore reduction proceeds in that district. First, the climate, because of the great altitude, presents a serious hindrance to cheap and successful mining operations. The winters are long and bitterly cold, the snow falling early and lying for several months to a great depth. Nothing of a useful kind can be raised, for the double reason that there is no soil and that killing frosts occur every night in the year. Even the summers are disagreeable and unfavorable for out-door work, rain falling almost every afternoon from the middle of June till the last of September. As at all great elevations in this latitude, pneumonia and other diseases of the respiratory organs are exceedingly prevalent in and around Leadville, great numbers having suffered from these complaints the past winter, a large percentage of the cases reaching a fatal termination. Neither health nor comfort can be counted upon by persons who, north of the fortieth degree, take up a residence at an altitude of 12,000 feet or more.

Then a trouble is likely to be encountered from much of the ore obtained here having too little lead to insure its successful smelting. With less than 25% of this metal for a flux it is difficult to reduce these carbonate ores by this method. While much of the ore from these mines carries a large proportion of lead, the majority carries less than 20% and cannot therefore be successfully smelted. That these ores will, with depth, grow richer in lead can hardly be hoped for, as this would run counter to past experience in this class of deposits. Everything considered, Leadville, now so crowded and bustling, does not seem likely to grow into a town of very large dimensions. When all the grounds around it shall have been taken up and there is nothing more to attract prospectors to the vicinage, or even retain those already there, its population will be diminished, only such remaining as can get work or as have secured locations requiring their presence. The number of furnaces to be erected on the spot will depend upon the quantity of self-fluxing ore these mines shall afford. If this shall turn out to be large these establishments will be numerous, and *vice versa*. In any event, a great deal of ore will be sent elsewhere for reduction, that is, if it shall be found rich enough in silver to bear cost of transportation. A careful survey of the field discloses to our view very little in these Leadville mines that ought to greatly excite the California capitalist, speculator, or prospector.

MINING NEAR READING.—A mile and a half above Reading, on the west bank of the Sacramento river, are the hydraulic claims of Breslauer & Tiffan. Their ditch is only one mile long. This, with the reservoir near the claim, gives plenty of water, with a moderate fall, during the rainy season. They have a fine and coarse red gravel bank extending some 30 feet above bedrock, and wash through a 100-foot bedrock tunnel, with several hundred feet of two-foot flume, dumping into the river. A clean-up for the season will be made in about two weeks, when a good paying yield is confidently looked for. From general appearances, and the best information obtainable, we should judge a large amount of ground is yet to be worked successfully in the vicinity of Reading. The only question seems to be as to a large and cheap supply of water.

CONCLUDED TO KEEP IT.—The owners of the Hite mine, after offering it for sale in the East, have withdrawn it from market, a valuable body of ore having lately been developed in the mine. This property is situated in Mariposa county, California, and has yielded the owners to date over a million in dividends.

THE Colliusville canning factory starts up this week. The run of salmon up to this time has been small.

The Valley of the Gunnison.

The valley of the Gunnison is described by all who have visited it as a paradise compared with the Leadville plateau. The altitude is not so great by several thousand feet, and the soil is as rich as that of any of the Illinois prairies. In summer and winter the grass grows in abundance and in rank luxuriance. Timber is also plentiful, the pines attaining three times the size of those growing near Leadville. The valley is known to contain extensive coal banks, and that, too, of a superior quality. Owing to their inaccessibility, no attempt has as yet been made to develop them, but there is little doubt but during the coming summer companies will be formed for the purpose of mining this coal, all of which will find a ready market in Leadville. As the case stands, one of the chief difficulties in the way of smelting is the lack of coal and coke. The latter, indeed, has to be hauled all the way from Trinidad, which greatly adds to the expense of operating reduction works in Leadville.

The miners who passed the last summer on the Gunnison found carbonates in various localities, both along that stream and Willow creek. They had no means of arriving at the value of the ore, but, as it looked well, they kept on prospecting and mining until late in the season, when two of their number concluded to come out, leaving the others to guard the mines during the winter. They accordingly packed 600 pounds of ore in sacks and brought it to Leadville for an assay. That small quantity of ore was sold to one of the smeltere here for $613, showing an assay of over 2,000 ounces to the ton.

The village or settlement of Gunnison lies on the river of the same name, 57 miles from Cleora, nearly due west. It consists at present only of a postoffice, a store, and blacksmith shop. Twenty-five miles north of Gunnison the traveler comes to a spur of the Elk mountains named Crested Butte. In and about Crested Butte there rise three little rivers, named respectively Slate, Washington and Taylor, all of which unite and flow into the Gunnison. In the headwaters of these streams considerable prospecting was done last summer by the party of which Mr. Smith was a member. He says that considerable bodies of ore are to be found in that neighborhood. Unlike the silver deposits of Leadville, they are found in

True Fissure Veins

With outcroppings plainly in view on the side of the mountains. The silver is found in conjunction with galena and copper, and occasionally with carbonates crystallized and having a color of light gray. The silver varies in richness, as it does in all other districts, running from 100 to 1,500 ounces per ton, although the average is higher than is generally found in this camp. In most of the claims already prospected gold has been found, varying from one-fourth of an ounce to 25 ounces.

The climate in the Gunnison valley is described as much milder than on the mountain tops. The warm rains coming over from Utah fall abundantly, the clouds being squeezed when they strike the lofty Sierra Nevada range, and deprived of their moisture. Vegetation is luxuriant everywhere in the valley, and wheat, corn and potatoes, can be raised easily. The basin of the Gunnison is in reality a vast park, being 100 miles long from east to west, and nearly as much in width. In the center of this basin flows the river, while from all the sides pour down the waters of the Uncompahgre, Lake Fork, Cebolla, Cochetope, Slate and Taylor rivers, besides numberless other creeks, abounding in speckled trout, while the adjacent woods are alive with deer, elk, bear and other game. The Elk mountains on the north are said to be of enormous hight, striking ruggedness and most unique and singular appearance. A recent writer says of them: "They differ from any other mountains on the globe because of their peculiar colors and strange forms. In the very front rank of the amazing array of peaks is the Teocalli mountain, a vast pyramid in bulk and form, showing the strange features of successive terraces, rising one above another, with cliff faces and level benches. The form is like the ancient sacrificial altars of the Aztecs, called by them "tcocalli"—hence the name. Teocalli is approached by a lovely open, grassy valley, with a pretty little creek, deeply fringed with trees, running through it, and dividing at the foot of the mountain, a branch pouring down from each of its sides. Viewed in the bright sunlight, the wilderness of pyramidal cones glow in red, yellow, brown and deep maroon, and on the northern and eastern slopes are the largest known fields of perpetual snow in all the Rocky mountains."—*Leadville Cor. Chicago Tribune.*

Moving the Decimal Point to Suit the Case.—The Horn Silver mining company of Utah, having disposed of 40,000 shares of their stock in New York, now offer an additional 25,000 at $17.50 each; these heavy sales at such handsome prices being based on the large quantity of valuable ore in sight in the mine, reported to be $17,000,000 in net profits—say a total of 50 millions, or such a matter. We alluded last week to the big figures that were now being employed in connection with this class of estimates, suggesting that in accepting these latter it would generally be safe to remove the decimal point one figure towards the left—perhaps we might as well remove it two, in this case.

Cape Foulweather.

The *Willamette Farmer* argues that there are good and substantial arguments to be made in favor of Cape Foulweather as the site for a harbor of refuge, if it shall prove that the location is well adapted to the purpose. That is, of course, the main object, but a point might almost be strained in its favor upon the ground that the construction of a safe harbor there will give the Willamette valley the benefit of another seaport. The construction of the harbor will certainly result in the building of the narrow-gauge railroad from Corvallis to the ocean—not to Yaquina bay merely, but to the shores of the constructed harbor. Such a consummation would be of the greatest importance, for while that point cannot become the great commercial port of the northwest, it can do a lively trade, and will result in bringing prosperity to the shores of Yaquina bay, and give the upper counties more direct communication and shorter distance to reach San Francisco, or even to load vessels for Europe, saving the great expense and detention that attends loading vessels at Portland. This advantage can only attend the construction of the harbor where it can be reached by railroad communication with the interior. The pass from Corvallis to Yaquina offers the most favorable route for such a road, and the enterprise of Benton and Linn county farmers has already secured a commencement of that enterprise, and it has been very faithfully worked up, so that its practicability is thoroughly understood. Any improvement in commercial facilities redounds to the benefit of the producer. The harbor of refuge at or near Yaquina bay, and the construction of the narrow-gauge road to connect the Willamette valley therewith, will enable producers of the upper and middle valley counties to ship their products much cheaper, and they will thrive better in proportion.

How well the location is adapted to this purpose is thus stated by a Salem paper: A careful survey of the bay north of Cape Foulweather by the United States engineers has demonstrated the fact that such a harbor already exists there formed by nature, and that only a small outlay is necessary to make it entirely safe, easy of entrance and ample for all practical purposes. At this time there is a sufficient depth of water to float the Great Eastern in perfect safety. It is not Yaquina bay proper, but a little north of that, some three or four miles, and is simply a large cove with good entrance and good natural protection. An expenditure of $656,000 will make it entirely secure, while the smallest estimate for any other point surveyed on this coast is over $3,000,000.

The King of Artesian Well Engineers.

Mr. Eugene Bandel of Benicia, sends us a copy of Wirth's *Deutscher Gewerbskalender* for 1871, in which is a lengthy biographico-technical sketch of Carl Gotthelf Kind, the "King of Artesian Well Engineers." From this sketch we translate the following short summary.

The sinking of deep bore-holes and particularly of such as require principally drilling, has been in earlier times a matter of high importance. However, the art proper, the rational management of well-boring, is a production of the present century. The advances of scientific geology, mineralogy and mechanics, furnished the basis for the explanation of phenomena that had previously been ascribed to blind chance, and without the thorough investigation of which the well-borer's drill would never have been taken from the hands of the rude laborer, and placed in those of the rationally educated engineer.

To the latter class of men belongs Kind, who will always, among all nations, be referred to as the one who knew so well how to improve the practice of well-boring, that the art was made to assume a quite new form.

The special improvements of Kind's in the domain of well-boring instruments and methods for the sinking of bore-holes of both large and small diameters, are so varied and numerous, that space enough is not demanded here to discuss them all. We bring forward, therefore, only the chief ones.

The most radical of Kind's improvements and inventions are as follows: First, boring with wooden instead of iron rods; second, an apparatus called "free-fall-drill," by means of which the drill, after being raised as far as necessary by the rods, falls loose away from the latter and thus accomplishes the drilling; third, auger for widening the bore-hole; fourth, safeties, by means of which breakages of the tools can be immediately discovered; fifth, augers for boring shafts of very great diameter; and sixth, means for making water-tight bored shafts of great diameter.

Rushing.—Three hundred men and teams are at work north of Snake river building the Utah & Northern road. One hundred thousand ties are ready for laying. The Laramie rolling mills are turning out tons of rails for the road, and every prospect points to its rapid advance into Idaho. The cars will run to the Snake river bridge this month. New passenger cars for the road are coming in the Ogden yard, and when the sleeping cars are ready we will have a change of time. The Utah & Northern passenger trains will then make close connection with the U. P. express.—*Ogden Freeman.*

Excursions to the Sierras.

It is understood that a large number of school teachers have decided to spend their summer vacation in visiting Mount Shasta and intervening points of interest. For some reason but few tourists seem to have learned of or duly appreciated that portion of the Sierra Nevada mountains lying in Shasta and adjacent counties. Probably because so much more has been written and printed by Eastern and California journalists concerning the glories of the more familiar (but not more attractive) section of the Sierras crossed by the overland route. The C. P. R. R. Co. by offering reduced rates to tourists over their northern routes realize the above facts, evidently, and are determined to do their part towards making the grandeurs of the scenery and the delightfulness of the climate of northern California better known.

It is also expected that many farming and other camping parties will take a northern direction during their vacation this year.

All will visit en route more or less of the principal towns and cities, including Colusa, Marysville, Chico, Tehama, Red Bluff, Reading and Shasta, passing the old Reading grant in the upper Sacramento valley just before entering the placer and quartz mining districts of the Sierra Nevadas, over 70 miles distant by route to the everlastingly white crowned Shasta.

The U. S. Government fish-hatching station (the most important nursery in all probability in the world) is on the McCloud river 22 miles from Reading. Good fishing is found upwards on different streams, and game is plentiful in the mountains and valleys from this point. Southern's station is 33 miles beyond. Eleven miles further, at Bailey's station, is the lower Soda springs, the water of which is fine, effervescing and icy cool. Five miles on Campbell's hotel is reached at the upper Soda springs, equally notable for a mild draft of wholesome mineral water. Eight miles then brings the tourist into Strawberry valley, in fine view and seemingly in the very presence of Mount Shasta. This and Squaw valley are spoken of in terms of unmeasured admiration by those who enjoyed their pure and delightful atmosphere.

For the benefit of those who may wish the figures, we annex the schedule of excursion rates via the northern division of the C. P. R. R. Co.:

No. Miles from Reading.	To Station named and Return.	From San Fran'co	From Sacramento
22	U. S. Fishery—Allens	24.50	10.50
44	Slate Creek	28.80	23.80
54	Southerns	30.80	25.80
64	Lower Soda Springs	32.80	27.80
65	Castle Rock	33.00	28.00
69	Upper Soda Springs	33.80	28.80
77	Strawberry Valley—Sissons	35.40	30.40

This brings the tourist to the vicinity of the majestic Mount Shasta, famous in song and story.

The Catamaran "Zarifa."—The catamaran is a nondescript vessel new to these waters. It is made of two long and slender parallel hulls, lying apart 12 or 16 feet but joined together by cross-beams. The original pattern is a South Sea Island production. It has been introduced into Eastern waters for some years past, but for some reason or other has not met with much favor in the yacht clubs and yacht regattas. The first catamaran made had a solid deck thrown over the breach between the two hulls, but the strain was so great by the hulls spreading keel out that the deck sprung. Beams were then introduced and securely riveted to the hulls and a deck placed on top, but the vessel in this condition lacked elasticity. The latest improvement is to connect these hulls with beams provided with a ball and socket joint at the point of connection, and a center beam linked in the middle. This allows each hull freedom to play independent of the workings of the other, and relieves the beams of the strain they would otherwise have to withstand. A catamaran of this style of construction, and owned by Robert Hall, of the firm of Howe & Hall, has been imported from the East, where she was built. The hulls are 33 feet in length and two feet in the beam, and 16 feet apart. She is fore and aft sloop rig, carrying a jib almost as large as her mainsail. The length of her canvas is 58 feet—nearly double the length of the hull. Her draft, with half a dozen persons on board, is not over 12 inches. She has been named the *Zarifa*. The *Zarifa* has been admitted into the San Francisco Yacht Club. Such a vessel as the *Zarifa* can be built and equipped in this city for $2,300. A round bottom vessel of equal capacity would cost about $5,000.—*S. F. Bulletin.*

Sub-marine Telegraph to South Africa.—The report comes from London that the British government has decided upon the immediate construction of a sub-marine telegraph to South Africa, having accepted the tender of the Eastern Telegraph Company. The route is by way of Aden, Zanzibar, Mozambique, Delagoa bay, and Natal. It will connect with the whole of the Eastern system of telegraph. From the same source we learn that the subterranean lines in Germany, to which we have several times referred, are attaining vast dimensions, and that the Reichstag has just voted $450,000 for further extensions.

Measurement of Water.

In determining the quantity of water discharged from any ditch, flume or pump column, the method adopted, as a general rule, consists in the selection of a plank (often without regard to any particular thickness), through which a rectangular opening is cut one inch wide by a number of inches long, to the edges of which are tacked two guide cleats or strips, between which a thin strip of wood, forming a gate, is fitted, so that an opening for the discharge of water one inch high by a suitable number of inches long can be made at will, and the number of square inches contained in said opening are spoken of as so many "miners' inches" of water. The head over the center of the opening is not generally mentioned unless requested, and when given will vary from four inches up to ten inches, depending upon the locality, usages, convenience or notions of the individuals gauging the water, and so we find from published records the following variations in the size of opening, head co-efficients and discharge of water, according to the usages of the different mining camps. At Smartsville, the head to center of opening is 9 inches; opening, 4 inches high by 25 inches long. The bottom edge of the opening is on a level with the bottom of the box, and will discharge 100 "miners' inches," and it is said that each inch will discharge 1.76 cubic feet per minute.

The Eureka Lake and Canal Co. measure through an orifice 2 inches high, 6 inches head to center, and an opening 20 inches long is said to deliver 40 miners' inches. The Excelsior, also the Sear's Ditch Co., deliver water under 10 inches to center of orifice.

The Phœnix Ditch Co., deliver it through an orifice 3 inches high, and pressure to center of opening of 5½ inches.

Gold Hill Ditch Co., El Dorado county, the orifice is 2 inches high, 1 inch wide and 4-inch pressure (whether to top of opening or center is not stated).

The Park Canal and mining company, in El Dorado county, delivered 1.39 cubic feet per minute as a miners' inch.

The Civil Code of the State of California, v. 1, p. 404, sec. 1,415, defines, that in locating claims for water rights, the "miners' inch" shall be under a four-inch pressure, which in no way defines the quantity of water discharged, as no dimensions of opening are defined.

Experiments made by H. Smith, Jr., to determine the value of a "miners' inch," at the North Bloomfield, Milton and La Grange mines, the opening was 50 inches long, 2 inches wide, 7 inches to center, through a 3-inch plank; bottom edge of opening had the last inch chamfered off, leaving the lower surface of the opening in contact with the water, similar to an opening that would be cut through a two-inch plank. The discharge for the one-hundredth part of the opening or one miners' inch, gave 1.5744 cubic feet per minute. The ratio of actual to theoretical discharge is stated to be 61.6%. The second set of experiments on the same size opening and head, made by A. J. Bowie, Jr., at the La Grange mine, the effective discharge per one miners' inch is given at 1.4994 cubic feet per minute, or ratio of effective to theoretical discharge 59.05%.

From the above collated statement the necessity will appear of finding out what the parties using the term "miners' inch" mean, or at what mining camp they were educated, before an approximate determination can be arrived at as to the quantity of water in cubic feet or gallons referred to.

On the Comstock, I believe, a majority of the persons using the term "miners' inch" mean a flow of water equal to 12 gallons per minute, or 1.604 cubic feet in the same time, and for convenience of reference I have arranged the following table, giving the flow of water for one "miners' inch," according to the head assumed, varying from four to ten inches to the center of the orifice. The co-efficient of contraction is taken at 6-10, being an average value from experiments, with an opening of one square inch cut through a two-inch plank, the temperature of the water being at 70°, one gallon equaling 231 cubic inches, and the weight of same at the above temperature is almost exactly 8.3 pounds:

Head to Center of Opening.	Discharge per Minute in		
	Cubic Ft..	Gallons.	Pounds.
4 inches	1.159	8.669	71.96
5 inches	1.292	9.665	80.22
6 inches	1.417	10.599	87.98
7 inches	1.532	11.460	95.12
8 inches	1.637	12.245	101.63
9 inches	1.737	12.993	107.84
10 inches	1.830	13.689	113.62

For any other size of opening, either of hight or length, the co-efficient of contraction, due to friction, and with it the quantity of discharge, will vary; and hence, when "miners' inches" are spoken of, all the conditions affecting the discharge or measurement should be given, if anything more than a guess at the quantity meant is desirable.—*W. R. Eckart, in Territorial Enterprise.*

Cooling Hot Journals.—Von Heeren proposes a method of cooling hot journals by a mixture of sulphur and oil or grease. The fine metal dust formed when a journal runs hot, and which strongly acts upon both journal and bearing, forms a sulphide of sulphur. This compound, which grows soft and greasy, does not cause any appreciable amount of friction. It has been very successfully used by the steamers of the North German Lloyds.

MECHANICAL PROGRESS.

Improvements in Iron Production.

In our last issue we gave an extract from an article written by J. W. Mallet for the *American Chemical Journal* entitled "A brief review of the most important changes in the industrial applications of chemistry within the last few years." The portion which is of most especial interest to our readers is that on the improvements in iron production, which we continue from last week:

As regards wrought iron, whose day for many purposes can by no means be considered as gone by, the most notable manufacturing improvement has undoubtedly been the introduction of mechanical puddling as a substitute for the more laborious and less uniform hand work. After many previous attempts, success in this direction has come with the application of the rotating hearth, of which the Danks furnace arrangement deserves to be taken as the type. The more general use of currents of water through double furnace walls as the means of allowing the highest temperatures within, with diminished risk of injury to the walls themselves, is an extension of the long-used water backs of the refinery furnace.

For cast iron, aside from the marked increase in the size of many of the furnaces built, and in some hands the use of a blast of considerably higher temperature than was usual a few years ago, the question of most interest has been that of the elimination from the metal of phosphorus and sulphur, particularly the former, with a view to the supply of metal to the steel makers suited in this respect to their requirements, since the modern methods of steel manufacture do not tend to remove phosphorus if present, the Bessemer process even relatively increasing its amount, and its retention in the steel to any large extent being ordinarily in the highest degree objectionable. The comparative scarcity and therefore cost of ores originally free, or nearly so, from phosphorus, while others are abundant against which the presence of this element can alone be urged in objection, renders the problem one of great importance.

Of the many plans proposed for getting rid of the undesirable element, two seem most to deserve notice. It has been found that in Cleveland ironstone from Yorkshire in England, and the same is probably true of many other ores, the phosphorus exists mainly, if not solely, as calcium phosphate, and that by washing the ore with a solution of sulphurous acid, obtained by passing the sulphur dioxide from burning pyrites into water, a large proportion, up to even 90% of the phosphorus, may be dissolved out and removed. It has been urged against this process as a fatal objection that the ore must be in fine powder to allow sufficiently thorough contact with the liquid acid, while the pulverulent condition unfits it for smelting in the ordinary way. While this is true as regards after use in the blast furnace, it seems quite possible that ore in powder might be managed in the Siemens furnace for the production of "Landon" steel, and, in the absence of material naturally pure enough, this process of preparatory washing may yet find application to a certain extent.

The other plan to be mentioned has more extensive claims to attention, if the facts upon which it rests are fully confirmed by further experience, and if it can be brought into practically workable shape. Mr. Lowthian Bell, to whose intelligently directed researches we owe much important information in regard to the chemistry of iron smelting, believes he has ascertained that phosphorus may be in large measure removed from melted cast iron by oxidation at a temperature lower than that suited for puddling, the oxygen being derived from a bath of molten oxide of iron or slag very rich in such oxide; though at a higher temperature, at all approaching that of the Bessemer converter, phosphorus would be taken up again by the iron from the very same slag. It is proposed that the iron shall be brought rapidly into contact with the rich slag by running it from the furnace into a circular converting vessel, revolving about its axis and containing the slag already in a state of fusion. In one experiment it was found that the phosphorus in iron from Cleveland ore could by such treatment be brought down to .055%, while continued contact, at full puddling heat, with the puddling furnace slag which had served as the means of purification, raised the proportion of phosphorus again to .153% in 65 minutes, and to .365% in three hours. These experiments are suggestive and full of promise that a solution of this important problem will yet be found, though as yet it cannot be said to have been reached in a practically useful and generally applicable form.

In noting the chemical aspects of the iron and steel industry, as developed in the last quarter of a century, we can not overlook the magnificent scale upon which the mechanical appliances used in working the metal have outgrown their former dimensions.

A visit to such works as those of Creuzot in France, Krupp's establishment at Essen, in Germany, the heavy gun factories at Chatham and the armor-plate mills at Sheffield, in England, or even to several of the works which have grown up in this country, presents a truly impressive picture of mechanical power directed and controlled by human brains. Such a single tool as the great Creuzot steam hammer, with its 75 or 80 tons of iron falling 18 feet upon an anvil of nearly 900 tons, and capable of forging masses of steel of 120 tons or more, represents a marvelous advance upon the means at the command of the iron workers of 50 or even 20 years ago. Yet the very source of the demand for these mighty machine tools, the growth of the manufacture of iron, and yet more steel, has, in the improved character of the material produced, opened up a still wider field and enlarged possibilities for the employment of mechanical energy upon the grandest scale.

MANGANESE STEEL should show a very fine grain in fracture, and an analysis should give substantially the following results: Sulphur, .10; phosphorus, 27; carbon, 65; manganese, 1.50. Metallurgists tell us that such a metal resists shocks very well, and that this enormous quantity of mangsnese added to the metal neutralizes the evil effects of phosphorus. But the best thing that can be done is to avoid the use of such cast metal cured by manganese. Two strips of the same metal when white-hot were welded together, but when it was attempted to bend them the first blow divided the strip into two pieces through the weld. Steel must not contain more than 0.3% or 0.4% of mangsnese, and a metal containing 1.50% or 2% of manganese is in most cases good for nothing. Inferior material, even if cured by manganese, will always give inferior steel. But as certain works prepare such a curious steel, it would be a benefit for the buyers if the manufacturers would supply them with a true analysis of the steel, because otherwise the buyer may get a cast metal which only the manufacturer can call "steel."

THE evils attending the use of oils and fats as lubricants upon machinery are well known to engineers and mechanics, but the causes and nature of their injurious action are not so generally understood. We give, therefore, a brief but very lucid explanation of their action which we find credited to Dr. Marquardt, by our contemporary, the Boston *Journal of Chemistry*. The most obvious and least objectionable evil attending their use is the gradual oxidation (or gumming) which they undergo, and in consequence of which their lubricating qualities rapidly diminish. A more objectionable property of these substances shows itself when they are applied to such parts of machinery as are more or less highly heated. In such circumstances, these substances are decomposed into their constituents, glycerine and fatty acids. The latter combine with the iron work of machinery to form an iron soap, the metal surfaces being corroded thereby and fresh surfaces exposed to corrosion. Marquardt recommends the substitution of the mineral oils (heavy pétroleum products that boil above 600° F.) for animal oils and fats as the remedy.

THE MANUFACTURE OF GUN BARRELS.—In the manufacture of a gun barrel, the process has changed somewhat at the Springfield Armory since 1861. Then an iron "scalp," 18 inches long, six inches wide, one-half an inch thick and weighing 10 pounds, was thrown into a furnace, heated, and curved in a rolling machine. It received only two welding heats, but was changed many times from the furnace to the rolling machine, or until it was rolled to the proper size and extended to the length of the barrel. In the rolling process a cavity was preserved with different sized steel rods. While hot, the barrel was passed on a rod into a straightening machine, afterwards annealed, cone-seated, bored, turned, ground, milled, rifled and polished. Now the workmen start with a steel bar eight or ten feet long and about one inch in thickness; cut it into pieces six or eight inches long, bore each piece, pass them into a furnace on a rod, then into the rolling machine, and proceed as in the old process.

RAILROAD ITEMS.—A French writer estimates that 4,000,000 tons of rails are required every year to renew the worn-out stock on the railways of the world already in operation, besides what are needed to lay down new roads. The average wear of a rail is 10 years. The rolling mills of the United States have a capacity of nearly 2,000,000 tons, though the consumption of rails, including imports is not half that amount. The capital invested in all the railroads of the globe exceeds $15,500,000,000. These roads, according to the statistics of Prof. Neumann-Spallart, require 62,000 locomotives, 112,000 passenger carriages, and 1,500,000 goods trucks. Annually 1,600,000,000 tons of merchandise and 1,500,000,000 passengers are conveyed by these means of transit.

WORKING STEAM AT HIGHER PRESSURE.—It is well known that great efficiency in steam engines is obtained by an increase of pressure and the use of expansion. To accomplish this, the point lies not so much with the engine as with the boiler, engineers finding no difficulty in working an engine with steam at 150 or 200 pounds per square inch; therefore Mr. Walt, an eminent Liverpool engineer, thinks there is no practical limit to the working pressure. Some engineers will be inclined to differ with this opinion, as the management of steam used expansively in simple reciprocating engines at ranges of pressure much exceeding those named, is considered by many risky practice.

SCIENTIFIC PROGRESS.

New Minerals.

Gedonite is the name applied by Helm, to what he describes as a new fossil resin, occurring with the amber of the Baltic region, and distinguished from it by reason of its greater friability, which unfits it for some of the applications of amber. The workmen call it friable or unripe amber. The author holds that this resin is not from the true amber pine (*Pinites succinifer*), but from some allied species. He finds it to be softer than true amber, to have a lower melting point, and to contain less oxygen in its composition. It is more readily soluble in ether and other solvents than amber, and contains no succinic acid. The name is from *Gedonia*, the Latin designation of the ancient city of Dantzic, near which it is met with. (For full description consult *Arch. d. Pharmacie*, December, 1878.)

Randite is the name given provisionally to a supposed new mineral substance, the analysis of which was reported to the Academy of Natural Sciences, of Philadelphia, at a recent meeting. The name is in honor of a well-known local mineralogist.

Urisite, a new mineral species, is described by Frenzel as occurring in the Caucasus, in association with Gelheisenerz (Jarosite ?) and conperas. Color, lemon-yellow to orange; streak, ocher-yellow; hardness, difficult to determine, but very low; specific gravity, 2.22; occurrence in bulbous masses, or pulverulent, earthy; the masses may be readily crushed between the fingers. When one of them is crushed, the glitter of exceedingly small crystals may be observed, of which the mass is made up. The crystals are orthorhombic, and under the microscope appear to have a stout prismatic habitus, with sharp edges, and to be generally well developed. The basal plane is often absent, and occasionally is strongly developed at one extremity, and absent, or but very slightly developed at the other, so that the crystals have occasionally a hemiphoric aspect, and resemble very closely the well-known tabular crystals of calamine. The crystals are transparent. After the removal of a few per cent. of insoluble impurities, the mineral was found to have the following constitution:

Sulphuric acid	32.08%
Ferric oxide	21.23%
Soda	16.50%
Water	19.80%
Total	99.66%

corresponding to the formula, Fe_2O_3, $2Na_2O$, $4SO_3$, $8H_2O$, and placing the mineral in Dana's group of hydrous sulphates.

INTERESTING EXPERIMENT.—During a recent snow storm, in the early afternoon, an interesting experiment was tried in Paris. At the moment when the sky was darkened by snow, the electric lamps were lighted in the square of the Theater Francais. The reflection of the light from the snow-flakes immediately dispelled the darkness and produced a very pleasing effect. It is proposed to try a similar experiment in misty weather, and if the light can penetrate even to the distance of 20 meters (65 6 feet), Jahlochkoff lamps will be established at points where the passing is most frequent.

THE influence of minute forms of vegetation in producing disease is illustrated in a singular example given in the *American Naturalist*. The dried blood of horses that had died of the "Loodiana fever," in India, on being sent to England, there afforded seed from which a crop of *Bacillus anthracis* has been grown, which justified its distant pathological origin by reproducing the disease in other animals.

FAWSITT has recorded a curious experiment on the resonance of flames. A tuning fork struck upon a table, and held till its sound was inaudible, was placed in the tip of the flame of a Bunsen burner. The sound came out again loud enough to be heard at some distance. Sir William Thomson explains the result by supposing that the flame acts as a resonator owing to the differences in the density of the gases which it contains.

FORMATION OF DEW.—An Amherst Professor has made a series of experiments from which he deduces a theory of the formation of dew exactly the opposite to that commonly taught. He maintains that dew, instead of being the result of condensation of the moisture of the atmosphere by contact with objects of lower temperature, is caused by condensation of warm vapors rising from the earth when the temperature of the air is lower than that of the earth.

PINTO'S JOURNEY ACROSS AFRICA.—Pinto, the Portuguese explorer, reports that, notwithstanding the grievous hardships and difficulties, he succeeded in saving all his papers, embracing 20 geographical charts, many topographical maps, three volumes of notes, meteorological studies, drawings, and a diary of the complete exploration of the Upper Zambesi with its 22 cataracts.

Light and Heat in Gas Flames.

At the recent meeting of the American Gas Light Association, Dr. T. O'Conner Sloane, Brooklyn, New York, read a paper as above.

It is well known to us, he said, that heat, in its industrial applications, is wasted to a great extent. The old problem of the conversion of heat of low into corresponding heat of high temperature, has to be solved, and to its non-solution the waste in most cases is due.

Theoretically, one pound of coal should melt 40 pounds of iron, yet this result is never even approached in metallurgical practice.

I wish to examine very cursorily the loss of heat in a gas flame. Light is here produced by the intense heat. The combustible gases are peculiarly fitted to produce such heat, because, as they are already in the gaseous state, they do not, in their combustion, have to make the step from solid to gaseous, as solid combustibles do.

The light given by the flame is due to the ignition of particles of solid matter. Carbon is present in the unignited gas in combination with hydrogen, as constituent atoms of gaseous hydrocarbon. When the gas burns, the heat of the flame decomposes these compounds; solid carbon, in a state of almost molecular division, is liberated, and becoming white hot, or incandescent, emits light. It travels upward through the flame, until reaching the top and outer zones, it is burnt into carbon dioxide, commonly called carbonic acid gas.

All the light of gas is due to the ignition of this carbon. The proof of this fact is, that while gases and liquids ignited may give light, it can always be determined by the spectroscopic analysis whether light is due to an ignited gas or not. Theoretically, and in fact, the spectrum of light derived from the ignition of a gas is discontinuous, while liquids and solids ignited give a continuous one. On subjecting the light of illuminating gas to this examination, it is found that it is due to the ignition of solid or liquid matter, because its spectrum is continuous. As there is no reason for the belief or probability that there is a liquid there present, we find that its light is derived from an ignited solid, and by analysis we find that carbon is the only substance present that remains in the solid state at elevated or even ordinary temperatures.

Where Does Coal Oil Come From?

This is one of the questions that has long agitated the scientific world, and upon the answer to it more depends than seems to at first sight. If we know its source we can fairly determine as to the nature and extent of the supplies, and as to where to look for them. The *Scientific American* says: Some have thought that the oils have been produced by a slow distillation during the process of coal formation. A fatal objection, however, to this theory is found in the fact that Great Britain, which has immense coal beds, contains nothing of the kind, though supposed traces have been found here and there.

The silurian and devonian rocks, which contain the sources of most of the oil wells now in existence, have great quantities of fossil remains, and this has suggested the theory that the oils have resulted from their decomposition.

Prof. Mendeljeff thinks that on the first formation of the earth vast reservoirs of inorganic iron and carbon existed in the interior of the globe. These were reached by the water condensing on the newly formed land and percolating beneath its surface. The heat decomposed the water into its component parts, oxygen and hydrogen, the first forming with the iron oxide of iron, the latter with the carbon petroleum and other hydro-carbons. If this theory be the correct one, there still exists in the center of the earth reservoirs of petroleum that are to the sources as yet known as the ocean is to the spring, whose waters finally find a resting place in its bosom.

Dr. T. Sterry Hunt, of Massachusetts, propounded in 1861 a theory to which he still adheres. He thinks that many of the animated beings of early ages were half vegetable, half animal, and that the decomposition of their tissues produced what is known as mineral oil. Certain magnetic oliferous limestones have been found to contain 4½% of their bulk of petroleum. A square mile of these 35 feet thick would yield nearly 8,000,000 barrels, and as the area of these rocks is very great, they may contain supplies calculated to last an indefinite period of time. The subject is one well worthy the attention of all interested in oil wells.—*N. Y. Journal of Commerce.*

DECOMPOSITION OF WOOD-TAR AT A RED HEAT.—A. Atterberg mentions that the results obtained by Lihermann, Burg, Salzmann, and Wichelhaus agree with his own observations on the tar of pine wood. By passing the tar and the less volatile tar oil of the Swedish "wood-oil" works through iron tubes filled with coke at bright redness, he obtained a tar containing all the important constituents of coal tar. It yielded 7% benzol and toluol; it was rich in naphthaline; it contained a tolerable quantity of anthracene, but little phenol. At incipient redness were obtained 10% toluol, containing a little benzol; phenols boiling between 190° and and 220°, but little phenylic acid, 0.3% of anthracene, but no naphthaline.—*Chemical News.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 10.		Week Ending Apr. 17.		Week Ending Apr. 24.		Week Ending May. 1.	
Alpha	20	16¾	23½	19½	19½	18½	20	19
Alta	5½	3¾	5⅞	4.90	5½	4½	6⅞	5⅞
Andes	40c	30c	40c	35c	45c	35c	45c	35c
Alps	....	....	....	....	....	....	....	....
Argenta	1.30	1.05	1.65	1.20	1.80	1.60	1¾	1.40
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	15c	....	25c	15c
Baltimore Con	50c	....	....	....	....	....	....	....
Belcher	6½	5¼	6	5⅝	5⅞	5⅜	7	5⅜
Belmont	40c	15c	30c	25c	10c	....	25c	20c
Best & Belcher	16¼	14	17	15⅞	16	15½	16⅞	16¼
Bullion	5½	4.70	5½	5¼	5¼	4.80	5⅞	5⅛
Bechtel	1.80	1½	1.60	1¼	1¼	90c	1⅛	95c
Belle Isle	45c	35c	40c	35c	45c	....	40c	35c
Bodie	10	7½	9½	7⅞	9⅞	8	9½	8⅞
Benton	3½	3	3⅜	3	3⅞	2.20	4½	4.15
Bulwer	21	18	22	19½	22	20	22	18¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	4½	3.60	4.70	2.60	2.85	2.05	2.80	2
Belvidere	2	1.30	1.80	1⅝	1.70	1.40	1.40	1.20
Booker	75c	50c	70c	55c	55c	45c	55c	35c
Caledonia	2¼	2.15	2¼	1⅞	1.90	1⅞	2	1.85
California	5⅞	5¼	6	5⅞	6⅞	6⅞	7	6⅞
Challenge	2.90	2½	3.20	2.80	2.85	2.80	3.10	2¾
Chollar	6¼	5¼	6½	5⅞	6	5⅞	6½	5⅞
Confidence	14½	12	15	14	13⅞	13	14⅞	13½
Con Imperial	1.55	1.20	1.70	1.35	1.45	1.35	1½	1.40
Con Virginia	6	4.95	6	5¼	6½	5⅞	6⅞	6⅞
Crown Point	5½	4½	5¼	4¾	4.95	4¾	5⅞	4.90
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	30c	35c	25c	25c	....	30c	10c
Concordia	35c	....	....	....	20c	....	20c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	20c	10c	....	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	30c	25c	45c	30c	60c	45c	60c	40c
Eureka Con	18	16	17	16	15	14	16	14½
Exchequer	5	4¼	5⅜	5¼	5⅜	4.80	5½	5⅛
Endowment	25c	....	25c	....	25c	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3½	3¼	3½	3	3.60	3.05	3½	3¼
Gila	30c	25c	35c	30c	35c	25c	35c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	9½	....	9	....	9½	9	9	....
Goodshaw	50c	45c	50c	40c	45c	40c	30c	....
Gould & Curry	7¼	6⅝	8⅞	8⅛	8½	8⅛	9¼	8⅞
Hale & Norcross	10¾	7¼	12¼	10⅛	11½	11	12½	11⅞
Hillside	2	1¼	2.15	....	2	....	2⅞	2.40
Highbridge	45c	35c	50c	25c	35c	25c	35c	10c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	....	20c	15c	20c	15c
Independence	1.55	1½	2⅞	1.60	3¼	2½	3	2.90
Julia	3.90	3.40	4.10	3½	3.90	3.55	4	3.60
Justice	4.70	3.15	4¼	3.60	3.90	3.60	4.15	3.70
Jackson	8	7	7⅞	7¼	....	....	6½	6
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5½	4.60	5	4¼	4⅞	4½	4⅞	4.65
Kossuth	10c	....	20c	15c	10c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	95c	75c	85c	60c	95c	50c	95c	70c
Lady Wash	1.20	70c	1	85c	1	....	1½	1.15
Leopard	75c	60c	1½	1.20	1.70	1½	1.60	1½
Leviathan	50c	20c	50c	40c	60c	45c	65c	55c
Leeds	60c	55c	....	....	50c	....	75c	60c
Les	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	....	25c	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2½	2¼	2.95	2¼	2.60	2½	2⅞	2.40
Martin White	6¼	6¼	6½	6	....	....	6	5⅞
McClinton	1.30	1	1¼	1.10	1.05	90c	1	85c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	30⅞	29	32½	30	34	31⅞	37½	34½
Mides	....	....	1	....	....	....	....	....
Morning Star	....	....	2	....	....	....	....	....
North Con Virginia	8	7⅞	8¼	8	10	7⅞	11½	10
New York	70c	55c	70c	60c	65c	55c	75c	65c
Northern Belle	10	9⅞	9⅞	8	8¼	7¼	7	6½
New Coso	....	....	....	....	....	....	....	....
Navajo	25c	....	25c	....	....	....	20c	15c
Occidental	75c	....	....	....	....	....	....	....
Ophir	23	20⅞	25½	22⅞	27	25	37	27
Oriental	60c	55c	55c	30c	40c	....	50c	....
Overman	9⅞	9	9⅞	9⅛	9⅞	8⅞	10⅜	9⅞
Panther	....	....	....	....	....	....	....	....
Phenix	3½	1⅞	3	....	....	....	....	....
Phil Sheridan	15c	10c	10c	5c	45c	40	45c	40c
Potosi	5¼	4	4½	3.95	3.85	3.70	4	3⅞
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5¼	4	5½	4¼	5	3.70	4	3½
Richer	90c	75c	80c	70c	90c	70c	70c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	10¼	9	11	9⅞	10	9⅞	11	9⅞
Seg Belcher	31	20	....	....	....	....	[illegible]	25
Sierra Nevada	43¾	40½	43½	41⅞	47	42¼	52½	47
Silver Hill	1¼	1.10	1.30	1.05	1.30	1.15	1½	1¼
Silver King	7½	7	....	....	8	....	8½	6
Silver Prize	....	....	....	....	....	....	....	....
Succor	60c	50c	65c	50c	50c	25c	35c	25c
Summit	2½	2.10	2.40	2	2.30	2	2.10	2
Scorpion	1.65	1.30	1.60	1.40	2⅜	1.60	2½	2.10
Solid Silver	35c	....	35c	30c	30c	....	30c	25c
South Bodie	60c	40c	50c	40c	45c	40c	40c	35c
South Standard	30c	15c	25c	20c	20c	15c	20c	....
Star	50c	40c	....	....	40c	....	50c	40c
St. Louis	....	....	....	....	....	....	30c	....
Syndicate	....	....	....	....	2	....	2	....
Tioga Con	2	1⅞	2.30	1.95	1.80	1.70	2.70	2
Tiptop	75c	70c	75c	50c	75c	60c	75c	60c
Trojan	20c	10c	15c	10c	10c	....	10c	5c
Union Con	56½	53	59½	57	69½	58	75	69½
Utah	15	13½	15½	13⅞	14⅞	13½	16⅞	14⅞
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.10	95c	1.15	1.05	1.15	1.05	1.15	1
Wells-Fargo	10c	5c	10c	....	10c	5c	10c	5c
Woodville	....	....	....	....	15c	....	30c	20c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15¼	13	16¼	14⅛	16	15	18	16⅞

Sales at S. F. Stock Exchange.

Friday A. M., Apr. 25.

55 Alpha...19
700 Alta...6½@6⅞
200 Andes...40@45c
330 Bullion...5½
140 Belcher...5⅞
140 Best & Belcher..16⅞@16¼
1240 Benton...4½@4¼
1100 California...6⅞@7
90 Confidence...13½
850 Con Imperial...1.45
770 Crown Point...5@4.90
450 Con Virginia...6⅞
175 Challenge...2.80
50 Caledonia...1.85@2
120 Exchequer...5¼@5⅞
100 Flowery...65c
5 Gould & Curry...8⅞
100 Hale & Nor...11⅞
80 Julia...3.65
565 Justice...4.15@4.05
500 Lady Bryan...75@70c
290 Lady Wash...1½
340 Leviathan...55@60c
240 Mexican...34⅞@34¼
100 Mackey...1.60
100 Mt View...5¼@5⅜
205 North Con Vir...10
890 N Bonanza...1.40@1½
580 New York...70c
260 Ophir...27@27¼
50 Overman...9¼
340 Silver Hill...1.40@1.35
800 Succor...25c
275 Sierra Nevada...47@47¼
250 Solid Silver...30c
10 Savage...9⅞
260 Scorpion...2.20@2.15
700 Trojan...10c
110 Utah...14⅞@15
130 Union Con...70@69½
50 Wells-Fargo...10c
30 Ward...1.05@1
220 Yellow Jacket...16⅞

AFTERNOON SESSION.

1350 Argenta...1½@1.40
200 Aurora T...25c
10 Bulwer...22
100 Bodie...8⅞
610 Bechtel...95c@1
900 Booker...50@55c
250 Belle Isle...40@35c
150 Black Hawk...2.80
150 Belmont...25c
540 Belvidere...1.40@1.20
550 C Pacific...2.30@2.05
360 Caledonia (B H)...2
50 Dudley...40c
190 Day...55@60c
30 Eureka Con...14½@14¾
700 Grand Prize...3.30@3¼
50 Goodshaw...30c
180 Gila...30@35c
50 Hussey...15c
650 Highbridge...30@35c
290 Independence...2.90
600 Jupiter...55@60c
515 Leopard...1½@1.60
50 Martin White...5⅞
220 Mono...3.10@3.05
325 McClinton...95c@1
460 Manhattan...2¼
250 Noonday...1.90@1⅞
635 Northern Belle...7
200 N Noonday...80c
450 Navajo...20@15c
800 Oriental...50c
100 Paradise...1.60
100 Richer...70c
45 Raymond & Ely...4
70 S Standard...20c
280 S Bodie...40@35c
900 S Bulwer...75c
130 Silver King...8
100 Summit...2.10
1075 Tioga Con...2¼@2.10
50 Tipton...75c
525 Tuscarora...5c
950 University...40c

Saturday A.M., Apr. 26.

220 Alpha...20@19½
550 Andes...35@40c
345 Alta...6⅞@6⅞
350 Argenta...1.40
240 Bulwer...21⅞@22
2045 Bechtel...1@1.05
390 Bodie...9@9½
50 Belvidere...1.35
400 Black Hawk...2.60
50 Booker...50c
90 Best & Belcher..16½@16⅞
350 Belcher...5⅞@5⅞
465 Bullion...5½@5¼
430 Benton...4.35@4.40
100 Belmont...25@20c
150 Belle Isle...40c
275 California...6⅞
1100 Con Imperial...1½
20 Chollar...6
310 Crown Point...5
570 Con Virginia...6⅞@6⅞
225 Confidence...14½@14¼
60 Caledonia...1.90@1.95
110 Challenge...2.90@2.95
100 Champion...10c
300 C Pacific...2.30@2¼
5 Caledonia (B H)...2
100 Day...55c
215 Dudley...40@45c
510 Exchequer...5¼@5⅜
35 Eureka Con...14⅛
370 Flowery...70@75c
450 Gould & Curry...8⅞@8½
130 Grand Prize...3.30
400 Goodshaw...30c
290 H & Norcross...12@11⅞
550 Hussey...15c
150 Highbridge...10c
350 Hillside...2½@2.40
1020 Independence...3
485 Justice...4.10
305 Julia...3.85@3.90
650 Jupiter...50c
250 Lady Wash...1½
70 Leviathan...55@60c
740 L Bryan...85c
170 Leopard...1.55@1½
730 Mexican...35½@35¼
200 Mackey...65c
100 Mt View...5⅞
125 Manhattan...2½@2.40
200 McClinton...1@95c
25 M White...6
1370 Mono...3.10@3
570 New York...75@70c
20 N Con Virginia...10½
155 Northern Belle...6⅞@6½
200 N Bonanza...1.65
500 N Noonday...50c
600 Noonday...1.70@1⅞
465 Ophir...28½@27¾
200 Overman...9⅞@9⅞
10 Potosi...3⅞
50 Phil Sheridan...40c
50 Paradise...1.60
390 Raymond & E...3.90
300 Savage...10⅞@10½
110 Succor...30c
630 Sierra Nevada...48
265 Silver Hill...1½@1.40
150 Solid Silver...30c
500 Scorpion...2.20@2¼
450 S Bulwer...75c
65 Silver King...8
200 South Bodie...3
500 Trojan...10c
200 Tuscarora...5c
1450 Tioga...2½@2.70
100 Tiptop...75c
100 Union Con...75@73
210 Utah...15
100 University...40c
900 Yellow Jacket...17½@18

Monday A. M., Apr. 28.

295 Alpha...20@19¾
140 Alta...6½
350 Andes...40@45c
350 Benton...4.40@4½
340 Bullion...5¼@5⅜
330 Belcher...5⅞
160 Best & Belcher...16½@16¾
665 California...6⅞@7
110 Confidence...14½@14
250 Con Imperial...1.45
400 Crown Point...5½@5
120 Chollar...6¼
375 Con Virginia...6⅞@6⅞
180 Caledonia...1.95@2
270 Exchequer...5⅞@5½
440 Flowery...70@80c
150 Gould & Curry...8⅞@8¾
230 Hale & Nor...12½@12⅛
270 Julia...4
540 Justice...4@4.10
165 Kentuck...4⅞@4.65
250 Lady Bryan...85@90c
200 Leviathan...65c
85 Lady Wash...1½@1.45
500 Mackey...1.90@1.95
675 Mexican...35¼@36
100 Mountain View...6¼
425 N Bonanza...1½
640 North Con Vir...11@10½
600 New York...75c
590 Ophir...29½@28¾
105 Overman...10
50 Potosi...3.95@4
190 Phil Sheridan...40c
450 Solid Silver...30c
775 Scorpion...2.10@2¼
150 Silver Hill...1.40@1½
10 Seg Belcher...28
550 Succor...25@30c
770 Sierra Nevada...50@49½
260 Savage...10⅞@10⅞
150 Trojan...5@10c
130 Union Con...74@74½
105 Utah...15⅞@16
50 Wells-Fargo...5c
150 Ward...1.10
250 Woodville...25c
85 Yellow Jacket...17½@17⅞

AFTERNOON SESSION.

685 Argenta...1½
300 Albion...35c
225 Belmont...20c
650 Belle Isle...40@35c
95 Bodie...9
650 Bechtel...1.05@1½
245 Belvidere...1¼@1.30
100 Bulwer...21½@21⅞
395 Black Hawk...2.10@2¼
810 Booker...50@45c
375 C Pacific...2¼@2.30
100 Caledonia (B H)...2.20
500 Dudley...50@45c
30 Eureka Con...14½
260 Grand Prize...3½@3.40
80 Golden Terra...9
1100 Hussey...20c
170 Hillside...2½
200 Hamburg...50c
800 Highbridge...30@35c
265 Independence...2.95@3
10 Jackson...6
1975 Jupiter...60@65c
395 Leopard...1½
300 Leeds...60c
125 Manhattan...2½
250 McClinton...95c@1
190 Mono...3⅞
50 M White...5⅞
100 Northern Belle...6⅞
1000 Navajo...20c
470 Noonday...1.90@1½
150 Paradise...1½
150 Raymond & Ely...3½
50 Real Del Monte...3½
200 Star...40c
20 Summit...2.10
110 Silver King...8@8½
100 S Standard...20c
700 S Bodie...40@35c
1500 S Bulwer...75@70c
1450 Tioga Con...2.40@2¼
130 Tiptop...75c
950 University...40c

Tuesday A. M., Apr. 29.

450 Alta...6¼@6
20 Alpha...19½
505 Belcher...5⅞@5⅞
495 Bullion...5½@5½
110 Best & Belcher..16⅞@16½
550 Benton...4.30@4.15
1945 Con Virginia...6⅞
2125 Con Imperial...1½@1.45
250 Challenge...2.90@2.95
805 California...7@6⅞
25 Chollar...5⅞
485 Crown Point...5½@5
100 Confidence...14¼@14½
70 Caledonia...2@1.90
680 Exchequer...5½@5¼
150 Flowery...85c
625 Gould & Curry...6⅞@9
165 H & Norcross...12@11⅞
280 Justice...3.90@4
1 0 Julia...3.95@4
125 Kentuck...4.65@4.70
625 L Bryan...90@95c
500 Leviathan...65c
740 Mexican...37½@36⅞
370 Mackey...2.10@2.15
150 Mt View...6⅞@6¾
395 N Bonanza...1⅞@1.40
85 North Con Vir..11½@11¼
960 Ophir...32@33½
255 Overman...10
50 Potosi...4
260 Sierra Nevada...49@50
45 Savage...10⅞
15 Seg Belcher...28½
300 Silver Hill...1.30@1.35
100 Succor...30c
730 Scorpion...2.40@2.30
200 Trojan...5c
160 Union Con...74½@74
25 Utah...16⅞
100 Woodville...30c
690 Ward...1.10
470 Yellow Jacket...17¼@17⅞

AFTERNOON SESSION.

750 Argenta...@1.60@1.65
600 Albion...25c
50 Aurora T...15c
910 Belle Isle...35c
105 Bulwer...21½@21⅞
500 Bechtel...1.05@1
65 Bodie...8⅞
170 Belvidere...1⅞@1.35
595 Black Hawk...2@2.10
200 Booker...40c
835 Caledonia (B H)...2.10
130 C Pacific...2¼
150 Champion...15c
735 Dudley...45@40c
90 Eureka Con...15
500 Fourth July...45c
135 Grand Prize...3.40@3¼
50 Goodshaw...30c
100 Golden Terra...9
110 Hillside...2½
1000 Hussey...20c
135 Independence...3
350 Jackson...6
1150 Jupiter...50@60c
60 Leopard...1½@1.60
625 McClinton...90c@1
270 Manhattan...2½@2.40
885 Mono...3¼@3.30
1150 Navajo...20c
430 Northern Belle...6⅞@7
850 Noonday...1.65@1.60
150 Paradise...1½
60 Raymond & Ely...3¾
20 Real del Monte...3½
250 Red Cloud...75c
1250 Star...45c
50 Syndicate...2
380 Summit...2
20 S Bodie...35c
200 S Bulwer...60@55c
10 Silver King...8½
175 Tuscarora...10@15c
650 Tioga...2.10@2
240 Tiptop...75c
200 University...40c

Wed'sday A.M., Apr. 30.

375 Alta...6¼@6⅞
300 Andes...35@40c
165 Bullion...5¼@5⅞
1395 Belcher...6⅞@7
370 B & Belcher...16⅞@16⅞
710 Benton...4.30@4¼
535 California...6⅞@7
20 Confidence...14⅞
175 Caledonia...1.95@2
2275 Con Imperial..1.45@1.40
1030 Crown Point...5⅞@5½
975 Con Virginia...6⅞@6¾
570 Challenge...3.10@3
370 Chollar...6
855 Exchequer...5¼@5½
150 Flowery...85@80c
335 Gould & Curry...9@9¼
7[illegible] Hale & Nor...12@12½
215 Julia...3.95@3.60
700 Justice...3⅞@3.70
205 Kentuck...4⅞
780 Lady Bryan...95@80c
450 Leviathan...60@65c
110 Mexican...37½
50 Mackey...2.15
50 Mount View...7
350 N Bonanza...1.45@1.40
555 North Con Vir...11½
50 New York...65c
1630 Ophir...38½@37
440 Overman...10@10½
1000 Phil Sheridan...45c
50 Potosi...3.95
45 Silver Hill...1.35
700 Succor...30@35c
290 S Nevada...52@52½
170 Savage...11
50 Solid Silver...25c
210 Scorpion...2½@2.45
330 St Louis...30c
175 Utah...16½@16⅞
150 Union...74@74½
300 Woodville...25c
40 Wells-Fargo...5c
620 Ward...1.10@1.15
225 Yellow Jacket...17¼@17

AFTERNOON SESSION.

1700 Albion...30@25c
1150 Argenta...1.70@1⅞
350 Booker...35@45c
250 Belvidere...1¼@1.20
30 Bulwer...20@18½
470 Black Hawk...2.10
300 Belle Isle...35c
140 Bodie...9@8⅞
1720 Bechtel...1
100 Concordia...20c
375 Con Pacific...2¼@2.30
500 Champion...25@30c
1000 Crœsus...10c
300 Caledonia (B H)...2.20
300 DeFrees...10c
1300 Day...45@40c
100 Eureka Con...16
800 Fourth July...45@50c
70 Grand Prize...3½
500 Golden Terra...9
100 Goodshaw...30c
425 Hussey...15c
140 Hillside...2½@2⅞
800 Highbridge...30@25c
330 Independence...2.90@3
340 Jupiter...50c
100 Jackson...6½
190 Leeds...75@60c
165 Leopard...1½
430 Mono...3½@3.55
275 Manhattan...2½
50 McClinton...85c
400 Noonday...1.90@2
240 Northern Belle...6⅞@6⅞
350 Paradise...1½@1.45
100 Real del Monte...4
75 Raymond & Ely...3½
100 Richer...65c
10 S Standard...20c
10 Silver King...8½
450 S Bulwer...65@70c
100 S Bodie...35c
50 Summit...2.05
200 Star...50c
600 Tuscarora...10c
1315 Tioga Con...2
25 Tiptop...60c
1250 University...25@35c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Booker Con G M Co	California	2	25	Apr 28	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 9	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	Apr 14	May 3	T E Atkinson	318 Pine st
Gould & Curry S M Co	Nevada	35	1 00	Mar 11	Apr 16	May 8	A K Durbrow	309 Montgomery st
Hale & Norcross S M Co	Nevada	61	1 00	Mar 12	Apr 16	May 8	Joel F Lightner	309 Montgomery st
Leopard M Co	Nevada	10	50	Mar 10	Apr 14	May 5	R H Brown	327 Pine st
Martin White M Co	Nevada	5	1 50	Dec 14	Jan 21	May 5	J J Scoville	59 Nevada Block
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 15	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	——	May 15	J W Pew	310 Pine st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	Apr 28	May 20	Jno Crockett	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Butte Creek H M Co	California	2	25	Apr 16	May 17	June 17	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 26	O H Bogart	106 Leidesdorff st
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hazard G M Co	California	3	10	Mar 21	Apr 22	May 9	J T McGeoghegan	318 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Pioneer Con M Co	Nevada	5	05	Mar 6	Apr 12	May 3	J M Buffington	309 California st
Queen Bee M Co	California	2	10	Mar 6	Apr 9	May 5	Thos A White	113 Leidesdorff st
Richer M Co	California	2	25	Mar 8	Apr 14	May 5	W H Lent	309 Montgomery st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Summit M Co	California	7	05	Feb 4	Mar 11	May 6	R N Van Brunt	318 Pine st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	50	Apr 19	May 26	June 12	H Aug Whiting	211 Sansome st
Sophia G M Co	California	1	02½	Apr 23	May 26	June 13	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Diana G & S M Co	Nevada	Jno T McGeoghehan	318 Pine st	Special	May 12
Endowment M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 5
Golden Gate Con H M Co	California	Jno T Geoghehan	316 Pine st	Special	May 9
Justice M Co	Nevada	R E Kelley	419 California st	Annual	May 5
Justice Con M Co	Nevada	R E Kelley	419 California st	Annual	May 5
Morgan M Co	California	J J Raphael	533 Kearny st	Annual	May 3
San Francisco Copper M Co	California	P Sanchez	258 Market st	Annual	May 5
Tiger M Co	Arizona	Wm H Lent	309 Montgomery st	Annual	May 5
Woodville Con S M Co	Nevada	R E Kelley	419 California st	Annual	May 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	April 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	Apr 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Apr. 24.

25 Alpha...19¼
240 Alta...5⅞@5¾
700 Andes...40@45c
115 Best & Belcher...15⅞@16
280 Bullion...5½@5¼
160 Belcher...5¼
480 Benton...4
50 Chollar...5⅞
1885 Con Virginia...6¼
200 Crown Point...4⅞
215 California...6¼
350 Con Imperial..1.35@1.40
95 Confidence...14¼@14
210 Challenge...2.80@2.85
250 Exchequer...5¼@5⅞
800 Flowery...65c
120 Gould & Curry...8¼@8⅞
100 Hale & Nor...11¼@11½
560 Justice...3.70@3.65
235 Julia...3.90@3.85
10 Lady Bryan...70c
200 Lady Wash...1
475 Leviathan...50@60c
30 Mexican...34@34½
135 Mackey...1½@1.60
500 Margarita...15c
150 Mountain View...5¼@5½
45 North Con Vir...10
650 New York...60@65c
910 N Bonanza...1.30@1.40
400 Ophir...26⅞@27
190 Overman...9⅞
70 Potosi...3.80
35 Phil Sheridan...45c
160 Sierra Nevada...46½@46
200 Succor...25c
255 Silver Hill...1.20@1¼
90 Savage...9⅞@10
700 Solid Silver...30c
995 Scorpion...2½@2⅞
230 Trojan...10c
130 Utah...14½
230 Union Con...69@69½
100 Ward...1.05
100 Wells-Fargo...10c
155 Yellow Jacket...15⅞@16

AFTERNOON SESSION.

630 Argenta...1.40@1½
495 Aurora T...15@20c
380 Albion...50c
80 Bodie...8
40 Bulwer...21⅞
200 Booker...50@55c
470 Belvidere...1.40@1½
335 Black Hawk...2.60@2.70
700 Belle Isle...35@40c
600 Belmont...10@30c
445 Bechtel...90@95c
400 Caledonia (BH).2.10@2.20
100 C Pacific...2.10@2
30 Champion...25c
100 DeFrees...10c
575 Day...60@55c
350 Dudley...40c
90 Eureka Con...15
300 Goodshaw...30c
330 Grand Prize...3½
300 Gila...35c
50 Highbridge...35c
600 Hamburg...50c
150 Hillside...2
375 Independence...2⅞@2.80
50 Jackson...6⅞@6⅞

Thursday A. M., May. 1.

100 Alta...6⅞
10 Alpha...19
85 Best & Belcher...16⅞
1295 Belcher...6¼@6⅞
230 Bullion...5½@5½
100 Benton...4½
495 California...6⅞@7
1050 Con Virginia...6⅞
650 Con Imperial...1.40
30 Confidence...14½
330 Crown Point...5⅞
220 Caledonia...1.90@1.85
270 Challenge...2⅞@2.85
800 Exchequer...5⅞
1840 Flowery...65@80c
345 Gould & Curry...9⅛@9¼
270 Hale & Nor...11⅞@11⅛
330 Justice...3.70@3⅞
415 Julia...3½@3.70
100 Kentuck...4.70
530 L Bryan...70c
150 Lady Wash...1.15@1¼
250 Leviathan...60@65c
520 Mexican...34½@34⅞
100 Mt View...6½@6⅞
90 Mackey...2
370 New York...65@70c
50 N Con Vir...11⅛
750 N Bonanza...1.10@1.20
200 Ophir...33⅞@34
35 Overman...9⅞
270 Potosi...3.80
130 Savage...10½
25 Seg Belcher...25
600 Succor...30c
650 Sierra Nevada...48½@49
185 Silver Hill...1½
100 Scorpion...2.30
50 Trojan...5c
115 Utah...15¼@15⅞
60 Union Con...71½@72
200 Woodville...20c
50 Wells-Fargo...5c
300 Ward...1.10@1.05
490 Yellow Jacket...16⅞@17

AFTERNOON SESSION.

100 Albion...35c
1100 Argenta...1⅞@1.60
100 Belmont...20c
595 Booker...40@50c
400 Black Hawk...2.10
295 Bulwer...12½@12⅞
600 Belvidere...1.15
1320 Bechtel...1@1.10
1115 Bodie...9½@9⅞
450 Champion...15@20c
23.5 Caledonia (B H).2.20@2¼
200 C Pacific...2¼
300 Day...45@40c
410 Dudley...35@40c
165 Eureka Con...17@17¼
1750 Fourth July...35@40c
300 Grand Prize...3¼

3350 Jupiter...60@65c
350 Leopard...1½@1.60
20 Martin White...5⅞
220 Mono...3.10@3.05
300 May Belle...25c
520 McClinton...1@95c
125 Manhattan...2⅞@2.55
310 Northern Belle...7
1100 Navajo...20c
500 Noonday...1.90
100 N Noonday...80c
50 Paradise...1½
200 Richer...70@75c
320 Raymond & Ely..3⅞@3.90
225 Revenue...1
1000 S Bulwer...75@70c
100 S Standard...20c
570 S Bodie...40@35c
30 Silver King...8
80 Summit...2.20
1100 Tuscarora...5c
110 Tioga Con...1.70@1⅞
100 Tiptop...80c
300 University...40c

700 Golden Terra...10@11
250 Goodshaw...30c
150 Hussey...15c
310 Hillside...2½@2.60
900 Highbridge...30c
150 Independence...2.80
250 Jupiter...50c
300 Leopard...1½
140 Manhattan...2⅞
15 M White...6
350 McClinton...95c@1
190 Mono...3½@3.60
540 Noonday...2.20@2.30
60 Northern Belle...6⅞@7
65 Paradise...1½
210 Raymond & Ely...3½
100 S Bulwer...65@70c
395 Summit...2
645 Silver King...8@8½
200 South Standard.15@20c
200 S Bodie...35c
1195 Tioga Con...2
1050 Tuscarora...10c
100 Tiptop...75c

Pacific Board—Latest Sales.

Wed'sday A.M., Apr. 30.

70 Best & Belcher...16¼@16⅞
220 California...6.95@7
50 Chollar...5.95
120 Con Virginia...6.70
730 Crown Point...5⅞@5.70
300 Gould & Curry...9@9.05
150 Hale & Nor...12@12¼
220 Mexican...36½@37⅞
150 Ophir...37@36½
240 Savage...10⅞@11
50 Yellow Jacket...17⅞

AFTERNOON SESSION.

55 Andes...35c
195 Belcher...6⅞@6.70
155 Boston...2.30@2¼
10 Best & Belcher...16⅞
20 California...6.95
20 Challenge...2.90
100 Con Imperial..1.45@1.40
350 Crown Point...5⅞@5.70
15 Exchequer...5½@5⅞
110 Gould & Curry...9@9⅞
100 Herald...25c
100 Justice...3⅞
20 Lady Wash...1¼
5 Mexican...36¼
370 Ophir...36⅞@35¼
20 Savage...10⅞
10 Sierra Nevada...52½
50 S Bodie...35c
100 S Utah...4c
100 Wells-Fargo...5c

California Board—Latest Sales.

Wed'sday A.M., Apr. 30.

50 Andes...40c
300 Atlanta...1c
40 Alpha...19¼@19¼
40 Alta...6¼@6¼
30 Belcher...6¼
40 Best & Belcher...16@16¼
50 Bullion...5¼@5⅞
200 Brilliant...25c
30 California...7
40 Con Virginia...6⅞
300 Con Imperial...1¼@1.45
50 Crown Point...5¼@5.20
30 Chollar...6¼
140 Challenge...3.10@3¼
90 Caledonia...1.90@1.95
55 Exchequer...5⅞@5¼
40 Gould & Curry...8⅞
300 Globe...11c
50 Hale & Nor...12½
20 Julia...4
30 Justice...3.85
60 Mexican...37@37½
100 Mint...18c
200 Monumental...2c
60 Ophir...36@36¼
70 Potosi...4.05@4
50 Senator...10c
50 Silver Jacket...75c
100 Silver Hill...1.35
200 S Utah...1c
50 Sierra Nevada...52@52¼
60 Savage...10¼@10½
20 Union...74½
100 Woodville...35c
100 Wm Penn...25c
100 Wells-Fargo...6c
20 Yellow Jacket..17⅞@17½

AFTERNOON SESSION.

120 Ætna...7c
100 Atlanta...6c
200 Atlantic...22c
75 Alexander...3⅞
40 Alpha...18⅞
60 Alta...6⅞@6⅞
50 Belcher...6¼@6¼

55	Best & Belcher	16¾@16¾	100	Glynn Dale	75c
60	Bullion	5¼@5½	220	Goodshaw	27½@30c
120	Boston	1¼@1	70	Hale & Nor	12½@12¾
120	Black Hawk	2.10	50	Julia	3.85@3.80
50	California	7@7¼	60	Justice	3.90@3.95
90	Con Virginia	6.70@6¾	40	Mexican	35½
300	Con Imperial	1.45@1½	40	Ophir	36@36½
90	Crown Point	5¼@5½	60	Potosi	4.05@4
500	Coso Con	5c	50	Savage	11@11¼
50	Chollar	6@6¼	40	Sierra Nevada	52@52½
130	Caledonia	1.95@2	120	Silver Hill	1¼
130	Challenge	3.15@3¼	150	Tiger	1¼
60	Exchequer	5¼@5.20	40	Union Con	75@75½
200	Enterprise	1½	500	Wells-Fargo	5c
300	Globe	12½c	130	Wales	1.10@1.05
116	Gould & Curry	9¼@9¼	20	Yellow Jacket	17½@17½

Mining Share Market.

Hopeful signs of life have been seen here and there during the past week, though the fluctuations have not been very great, nor prices very permanent. There have been some good features and some serious drawbacks. The former in the scarcity of marginal holders, the absence of wild and varied fluctuations, and a firm and apparently healthy demand for prominent shares. The latter in the discouraging lack of dependence to be placed on the regularity of present bullion production and the delay in reaching the long-promised new bonanza ground in the Comstocks. The early part of the week presented the same old story, prices firm and business light. Farther along, a stronger tone was developed and a number of stocks, notably the south end Comstocks, rose. The movement was slight, however, for but few succeeded in reaching a dollar rise. Toward the close there was a strengthening of quotations all along the line, with an evident purpose of forcing a rising and active market. This movement can hardly be referred to any actual "finds," it is rather the result of a feeling that there is a better and more healthy speculative market not far ahead in the future.

Accounts for Their Failure.

Editors Press:—In your last issue you say that you are surprised at, and cannot account for, the many English failures in "stocks, mines, tunnels and other schemes" on this coast, and court answers from those who think they can throw any light on the subject.

In regard to stocks English investors have, in common with all outsiders in this hazardous game, only added to the ill-gotten gains of the insiders. As regards their investments in mines, I must be allowed to dissent from the following expressions that occur in your remarks on this subject: "And yet they do not seem to have acted precipitately in making these investments." "They neglected none of the usual precautions." "They employed competent experts," etc., etc.

In treating this matter seriously it must be admitted that there are many blanks to a prize in American as well as English mining, and therefore more than ordinary amounts of practical experience and common sense are required, for both selection and development of mines, here as well as elsewhere.

I will therefore ask you, and through you these English investors, the following pertinent questions:

Would they be willing to work a Cornish mine simply on the recommendations of college professors or graduates, even were they no less eminent than Dana or the celebrated Englishmen, Lyell, De le Beche or Murchison? Have not Cornish mines been *invariably* worked only after advice from *experienced, practical* captains?

We have many such practical men here whose intelligence and long experience have greatly aided American miners to success; yet, strange as it may appear, only in a few instances, have these parties from abroad availed themselves of their valuable services. If they would consult more generally the opinions of men having practical knowledge of mines and mining affairs, their chances for making a final success would be greatly increased; besides, we hardly ever hear of anyone belonging to this class of experts, making money enough out of two or three mine examinations to enable them to give up business and live on their incomes.

Anglo-Columbian.

San Francisco, April 29th, 1879.

Copper City, Shasta County.—We learn that since the recent assignment, the Extra mining company's mill is steadily yielding a good profit and the assignees are paying off the back wages of the workmen, as preferred claims under the law. The O'Harra furnace has done good service at this mine. This furnace has demonstrated that ores in this district can be worked at a profit. Will not this fact prove an incentive for capitalists of good judgment to come forward in season and develop many of the idle and rich claims of Shasta county, having ores that have heretofore been considered difficult of reduction. The Winthrop company are doing limited prospect work. The Afterthought company have a new O'Harra furnace erected, which will go into operation soon.

At the Iowa Agricultural College every girl in the junior class is taught how to cook and other household accomplishments.

A valuable limestone quarry has been discovered in the hills west of Colusa.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

The Oneida.—*Dispatch*, April 26: A crosscut has been running for some time past in the Oneida mine, in search of a vein of quartz calculated to exist in the direction the tunnel was run. In this crosscut a ledge has been struck, which, being followed down a short distance, has developed some very fair looking rock. It is reported that a number of additional stamps will be set in operation at the mill about the first of next month, there being only 20 employed at the present time.

Plymouth Notes.—Cor. *Ledger*, April 26: Aden & Co. have bonded their quartz mine to a San Francisco company of capitalists, who have commenced work. The claim is patented, and is located about three-fourths of a mile south of the Phœnix lode. Charles Green and company have commenced work on the quartz claim on the south extension of Thomas Bowden & Co.'s claim. It is their intention to fully prospect the ground this season. Lucky Baldwin is interested in the development of the Aden mine. Last Friday the long deferred pay day of the Phœnix company rolled around, to the joy of the workmen. During the last seven months, so New York papers say, dividends have been paid to the amount of $114,000. It is not known whether that includes all the surplus earnings of the company or only the dividends paid to New York stockholders.

DEL NORTE.

Coal Prospect.—Crescent City *Courier*, April 26: While Jose Teran was digging post holes for Jos. Marhoffer, on his ranch, he struck a prospect of coal which is thought to be an extensive vein. The work of further prospecting will be done immediately, which may develop a mine of wealth.

Silver Mine.—A rumor is afloat that a silver and copper lode has lately been discovered about eight miles north of Big Flat, by a Mr. Condon. If reports prove true, it is nearly, if not quite equal to the great mineral discoveries at Leadville, Colorado. The work of prospecting it has already began.

EL DORADO.

Springfield Mine.—Placerville *Democrat*, April 26: This mine, formerly the "Church Union," is in splendid condition. The main incline will soon be down to the 700 level. A strong force is at work on the stopes keeping the 16-stamp mill running steadily. The development of the mine has progressed so far that an additional battery of 10 stamps will soon be put in. Mr. L. R. Foundstone, the superintendent, is thoroughly conversant with his business, and, under his management, everything moves as smooth as clock work.

FRESNO.

Tin Mine.—*Expositor*, April 26: Since the discovery of Charley Converse's tin mine, on the south side of King's river, several other deposits of tin have been discovered in the Sierras. The deposits appear to be extensive—one vein being traced for over a mile, and varying in width from 30 to 60 ft. If the ore should prove rich enough to work, and sinking on the veins show them to be permanent, a new species of mining industry will be developed. A good tin mine is more valuable than a gold mine.

MARIPOSA.

Rich Prospects.—*Gazette*, April 26: A rich prospect has recently been struck in the Pine Tree mine and tunnel, of the Mariposa Land and Mining Co., where the tunnel taps or crosses the specimen vein. At this point they have been sinking a shaft which is 166 ft below the level of the main tunnel, and about 60 ft below the bed of the river. Already a four-ft vein of good milling ore is at command, and in this is an exceedingly rich strata of rock about three inches in width, and growing wider as the work advances. There are said to be other and richer developments recently cropped out in the vicinity of the valley which are astoundingly rich in gold, but for certain reasons are kept a secret. It may be that the secret discovery is just off the edge and will be found necessary to move the stakes over a little, so as to be included inside or outside the present survey. It is well known to be a portable boundary, or was during Fremont's administration.

MONO.

Standard.—*Standard*, April 20: The south drift from the main shaft, 385 level, has been run 15 ft; total length, 380 ft. The ledge is three ft wide, and looks well. It is expected that a connection will be made in a few days between this drift and the north drift on the Cook ledge. The east crosscut from this south drift is in seven ft, and at present is in hard rock. North drift to connect with the incline is in 141 ft; progress, 14 ft. The ledge is three ft wide, of very fine ore. An upraise has been made on this ledge 20 ft, at a point 100 ft north of main east crosscut, where the ledge is three and one-half ft wide, of good ore. The east crosscut, 700 level, is in 40 ft. The rock is still very hard. The west crosscut is in 57 ft. The West Standard winze is down 70 ft, and shows the ledge 18 inches wide, of rich ore. The Gildea south drift is in 115 ft. The ledge is two ft wide, and looks well. The Cook ledge in the north drift is 18 inches wide, of very rich ore. This drift is in 170 ft. The stopes are looking well.

Bulwer Con.—The south drift, 380 level, is in 272 ft; progress, 10 ft. The ledge is two ft wide, and looks well. The west crosscut from this drift is in 120 ft, a progress of 20 ft. The rock in the face is very hard. The north drift from this crosscut is in 30 ft. The ledge is three ft wide. The south drift is in 25 ft. The ledge here is two ft wide, and looks well. The south drift, 300 level, has been extended 13 ft; total length, 102 ft. The ledge is two and one-half ft wide, of very fine ore. The Stonewall stopes are looking well.

Red Cloud Con.—The west crosscut, 400 level, is in 259 ft. Since passing the Packard and Morton vein, the drift has passed through 35 ft of low-grade quartz. One seam of clay and quartz was cut, prospecting well in coarse gold. The east crosscut, same level, is in 206 ft. On the 250 level, drifts are being extended north and south on the Red Cloud vein. That to the south is two and one-fourth ft wide, of $20 ore.

Summit.—The north drift, 200 level, has been run 10 ft; total length, 136 ft. The ledge is 10 inches wide, and looks well. The east crosscut from this drift is in 34 ft, and at present is in very hard ground. The south drift is in 250 ft; progress, 39 ft. The ledge is 18 inches wide. The shaft is down 68 ft below the 200 station. The ledge in the bottom is two ft wide.

Tioga.—On the 320 level a progress of 10½ ft was made in the west crosscut. On the 420 level, 17 ft was made in the east crosscut. The west crosscut, 520 level, is in 110 ft, a progress of 27 ft the past week. A north drift will soon be started on this level. The shaft will be widened to a three-compartment from the surface down within three weeks.

The Belvidere.—The winze on Great Western Hill is down a distance of 40 ft. The bottom of the winze is not showing as much rich ore as when started, and is from 25 to 30 ft deep. The ore chimney seems to make off to the north. The Bulwer tunnel is now in Belvidere ground, and, judging by the sound of their work and without a survey, they must now be very close to the Great Western ledge. This tunnel will crosscut their ground about 150 ft deeper and about 150 ft further north than the winze they are now sinking. The Bulwer will soon connect their 406 level from the Standard new shaft with the bottom of the winze in the Stonewall ledge. This will give good air and enable them to cheaply prosecute important work on the east side of their ground.

Fine Development.—One of the most encouraging developments that has taken place on the east-southeast slope of the Bodie bluff for months past is the cutting of a two and one-half ft ledge of clean, well-defined quartz, on the 250 level of the Jupiter, a distance of 72 ft directly east of the main shaft. The strike of the ledge is a peculiar feature, as its course at the face of the crosscut is pretty sharp northeast and southwest. The ore prospects at the narrow point passed through satisfactorily, and drifting upon it is not unlikely to run into ore of superior grade, as it possesses an unusually healthy character.

NEVADA.

Round Mountain.—*Herald*, April 20: From near the south end of the south tunnel a drift has been run 86 ft, and on each side of this drifting is at present going on. The ground is being drifted from the end of the branch tunnel toward the main tunnel. There are at present 12 men employed at the mine and they are taking out the gravel quite rapidly. There is a fine natural dump at the mouth of the tunnel and the company have constructed about 500 ft of flume, with a splendid under-current, through which the gravel is passed in the washing process. Water is obtained from the South Yuba ditch. The company have just let a contract to extend the main tunnel ahead 100 ft further.

The Planet.—*Transcript*, April 26: Blue gravel has been struck in the Planet mine, near Lowell Hill, in the upraise from the tunnel, at a distance of 1,712 ft from its mouth. The upraise was commenced several weeks ago, and had reached a distance of 20 ft when the regular blue gravel channel that runs through the ridge was run into. The gravel is of exactly the same character as is found in the Swamp Angel, adjoining ground, being composed of fine broken quartz and cement, and prospects in gold. It is not yet ascertained whether the bottom of the channel has been struck or whether it is on the pitch of the bedrock. Drifts will be run to determine this fact, and if found necessary the tunnel will be extended on its regular grade to reach the channel at its lowest point. It is believed, however, that the tunnel is low enough to work the ground to full advantage. The company owns a large body of ground which will require years to work out.

Washington Mine.—The new shaft on the Washington mine having been opened through, about two weeks more will be required to do the necessary timbering to put it in good working condition. The company intend putting in a new water wheel to drive the pump. It will be 40 ft in diameter, and driven by water from the ditch that supplies the stamps of the Idaho mill.

The Hudson Mine.—Everything at the Hudson mine in Pleasant valley is running to the satisfaction of the management. Level No. 2, at a depth of 184 ft, is now in 32 ft south, the work on it all having been done within two weeks. The vein in this tunnel is 17 inches thick, and quite rich in sulphurets and free gold. The tunnel is to be pushed ahead by contract about 50 ft further before stoping commences.

Other Notes.—The McAllis claim, at Hunt's hill, which has been shut down for repairs for several days, commences washing again this week. The Florence blue gravel mining company partially suspended operations a short time since to put in a derrick and make other improvements and repairs. This week washing will be commenced in full blast again. The Pittsburg mine is taking out good rock on the 600, 700, and 800 levels. The mill is kept running up to its full capacity, and is doing good work. A blast of 800 kegs of powder was made at the claims of the English company at You Bet lately. An immense amount of ground was broken up by the blast, and extended so far as to endanger the road, the bank being within 30 ft of the road, which is badly cracked.

PLACER.

New Mine.—*Herald*, April 20: A short time ago Geo. Manuel discovered and commenced work on a new quartz ledge on Duke's place, near the Stone House, a short distance down the ravine from Auburn. He has the shaft down now 22 ft, and in sinking that depth, has taken out 10 tons of the ledge rock. A sample crushed at Simons & Pelster's mill panned out about $10 to the ton. This prospect is considered quite encouraging.

Excitement.—*Argus*, April 26: There is some local excitement over rich reported discoveries made in two quartz mines lately re-located about half a mile southeast of Penryn. Mr. Fogg, of Sacramento, is the owner of one of these claims. He is about to erect a 10-stamp mill to be run by water from the Bear River ditch.

SAN LUIS OBISPO.

Gold Discoveries.—*South Coast*, April 23: It is reported that rich placer gold has been discovered on the headwaters of the Santa Maria river. It has been known for a long time that gold was there, but recent prospecting has developed the fact that the diggings are rich. Quite a number of persons have already gone out.

SANTA BARBARA.

Prospecting.—Lompoc *Record*, April 26: Lompoc is still striving to get up an excitement among gold hunters. The recent developments in this direction would seem to indicate that she may yet rank favorably with prominent mining districts. The findings thus far, though very promising, are not sufficiently alarming to cause farmers to neglect their soil, though many have already staked off claims, and had their first experience in placer mining. The Russel amalgamator, which we believe was shipped down from San Francisco, did not give entire satisfaction, as it was almost impossible to save the fine gold with it. Some fine specimens of quartz were brought in from the vicinity of El Tranquillon last week.

SHASTA.

Copper City.—Reading *Independent*, April 24: There are 30 men employed in the Extra mill, there being two shifts of 15 men each. The mill is kept constantly running, and bullion is being produced at the rate of about $5,000 per week. Under the able management of Mr. Hall expenses are reduced to the lowest possible figure, and at the rate they are at present turning out bullion it will not be long before the company will be free of debt.

SIERRA.

Hunter's.—Downieville *Messenger*, April 20: The ground of this company lies beneath the ridge of which Mount Filmore is the most conspicuous point, across the course of the rich lead of the Howland Flat mine of days gone by; the Union, Hawkeye, Down-East, Pittsburg, Monumental, Empire, all drew upon this deposit, and now the Bonanza takes it up where the Empire left off, and the Hunter's joins immediately upon the Bonanza, covering the whole ridge, from beyond the summit northwest to the outcrop of the rim rock upon the southeast, and for a full mile along the natural and inevitable course of the lead. The claim has a tunnel into and 400 ft beyond the rim rock, which pitches under the channel, being from 50 to 100 ft above the bottom. A shaft will be sunk in the said channel this summer, and when its riches are thus demonstrated another tunnel will be run to tap it.

TRINITY.

Lower Trinity.—*Journal*, April 20: From this section mining prospects were never more cheering. Rumor says that near the mouth of Hawkins creek, where parties have been engaged running tunnels for several years, the Blue Lead has at last been struck and promises large production. A company now working have a bank of gravel 50 ft in depth, the lower 15 ft being regular blue gravel, and the belief is that the old bed of Trinity river has been found. The deposit is known to extend for half a mile and probably much farther. The gold found in the blue gravel is principally mixed with quartz. There are said to be many similar openings in that section, but capital is needed to bring water in order that they may be worked.

New River.—A Portuguese company on Quimby's Flat, have lately struck a back channel which is very rich. It lays further back than has ever been worked before. A contract has been let for a six-ft ditch from main New river to Rattlesnake bar where excellent prospects have been obtained. The Slide Creek company, on the North Fork of New river, are at work and well satisfied with their prospects.

Working Well.—Everything at Dixon Bar is working splendidly. The company has been running several days, and as an indication of the prospects it is stated that gold can be seen in the riffles. One thousand ft more ditch has been contracted for, and when completed two giants will be run, thus working to better advantage. A partial clean-up will soon be made.

NEVADA.

WASHOE DISTRICT.

Our usual Washoe letter having failed to come to hand in time for this issue, we substitute therefor latest letters received by companies in this city from Superintendents on the Comstock:

Belcher.—Letter of 26th: North incline has attained a depth of 116 ft below the 2660 level, having been sunk 25 ft and timbered 36 ft during the week. The bottom still continues in good blasting ground. To the length of the 2500 south drift 28 ft have been added, making its total length 328 ft. The face of this drift is in good working ground. Crosscut No. 4, on the 2360 level, is now in 128 ft, having made 32 ft during the week. The crosscut is passing through stringers of quartz assaying from $8 to $10 per ton, but has not yet reached the vein.

Lady Bryan.—Letter of 26th: Since last report the shaft was sunk 10 ft; hard bird's-eye porphyry, the same material now in the bottom of it. The north drift, 600 level, was extended 23 ft through porphyry full of iron with bunches of quartz through it, the same material now in the face. The south drift was extended 21 ft through quartz giving low assays, showing very plainly that the quartz is getting to the east of the drift as they go south. The east crosscut from the south drift was extended 24 ft through a mixture of quartz, clay and porphyry, the same material now in the face; everything is running well in and about the mine, the water is getting less.

Mexican.—Letter of 26th: On the 2100 level the joint Ophir upraise is up to the 2000 level, and they have commenced drifting to connect with the main north drift, which connection they expect to make on Monday next. On the 2000 level the joint Union Con. upraise to connect with the joint winze down from the 1600 level is now up 66 ft, having been extended 22 ft during the past week. The material passed through still continues in vein formation, showing an increase of water. On the 1600 level the joint Union Con. winze has been sunk and timbered 12 ft during the week, and is now 318 ft on the slope below that level. The water causes some delay in sinking, but is easily handled by the donkey pump. They are still engaged in repairing the north drift to the Sierra Nevada shaft.

Crown Point.—Letter of 28th: Since last report they have sunk the incline winze 30 ft; total distance, 180 ft, on the slope below the 2506 level. The bottom is dry ground. The joint crosscut No. 1, 2500 level, is in 66 ft. Crosscut No. 2 is in a distance of 144 ft. Both crosscuts are still in dry porphyry, neither of them having yet reached the ledge.

Bullion.—Letter of 28th: The east crosscut, on the 2150 level, has been advanced 36 ft. The formation in this crosscut is vein porphyry, with streaks of quartz. Work will be discontinued in this crosscut during this week to allow the erection of the new air compressor at the Imperial and Bullion shafts. The station at the 2150 level for the winze engine is not yet completed; work will not be discontinued at this point.

Union Con.—Letter of 26th: On our 1000 level we have sunk and timbered the joint Mexican winze 12 ft during the past week, making a total depth of 378 ft on slope below that level. The water causes some delay in sinking, but it is easily handled by the donkey pump. We are still repairing the north drift to Sierra Nevada shaft. Flow of water from east drift continues to be about 1½ inches. On 2000 level the main north drift has been extended four ft, and is now 183 ft north of our south line. The material is somewhat harder than at date of last report, showing some water. Joint Mexican upraise to connect with the joint winze down from 1600 level now up 66 ft been extended 22 ft during the past week; material continues vein formation showing increase of water. On 2300 level main south drift from Sierra Nevada incline now in 60 ft passing through vein formation with streaks of clay showing some water.

Exchequer.—Letter of 28th: During the past week our north drift has been advanced 18 ft, making a total of 368 ft. The formation is soft vein porphyry with streaks of quartz. A small seepage of water still exists, but not sufficient to interfere with work. Work will be discontinued at this point during the week to allow the erection of the new air compressor at the Imperial and Bullion shafts.

Gould & Curry.—Letter of 28th: The 1700 east joint drift has been extended 34 ft since last report. Face of drift is at present in a soft formation. Good progress is being made in retimbering the 1700 level winze station. The Osbiston shaft was sunk and retimbered 15 ft during the week; there is a stronger flow of water than at last report. The drain tunnel is in 380 ft.

Best & Belcher.—Letter of 28th: The 1700 level joint east crosscut is in a distance of 815 ft, from the north lateral drift; the face is in soft ground. We have stopped all work on the 1006 level for the present. The new joint shaft has attained a depth of 530 ft, 15 ft having been sunk and timbered during the week. The bottom is in good sinking ground. The drain tunnel was extended 30 ft; total length to date, 386 ft.

Chollar.—Letter of 26th: During the past week we have repaired 20 ft of Chollar-Norcross-Savage shaft. Water has raised 122½ ft since last weekly report, and now stands 1,804 ft below the surface, making 517 ft of water in the shaft. Temperature of the water, 127° Fahr.

California.—Letter of 26th: Shipped to-day nine bars bullion valued at $41,920.86; total to date $322,418.37.

Con. Virginia.—Letter of 26th: Shipped to-day six bars bullion valued at $20,643.20; total to date $212,344.42.

Julia.—Letter of 26th: We are progressing with the repairs on the 2000 level south drift as rapidly as the extreme heat will permit. Winze sinking from 1800 level has attained a depth of 43 ft. Continue to develop a fine character of metal bearing quartz.

Ophir.—Letter of 24th: Shipped to-day five bars bullion valued at $10,677.14.

BATTLE MOUNTAIN DISTRICT.

The Bowers Coal Mine.—*Silver State*, April 20: This mine or coal deposit was discovered by L. H. Bowers, the present owner, on the 12th of June, 1875, and filed as coal land in the United States Land Office at Elko, January 20th, 1876. At the surface it presented two stratas of coal, separated by a strata of sandstone a few inches in thickness, and these conditions have been preserved with great regularity to a depth of 180 ft, on the incline, which Mr. Bowers has sunk. The dip of the vein is about 22°, very regular, and the formation is pronounced to be of the most favorable character, consisting of slate on the under and sandstone on the upper side. At the present depth there are two veins separated by the strata of sandstone above referred to; the upper of which measures four ft and the lower two and a half ft in thickness of solid coal. H. C. Evans, of Pottsville, Pa., a practical coal miner, analyzed a specimen and pronounced it lignite of the best quality for making steam and other uses. Mr. Bowers uses it for blacksmithing, and burns it in a grate in his house with perfect satisfaction. It has also been tested by blacksmiths at Lewis and Battle Mountain, and found to be all that could be desired, burning brightly and leaving but a small quantity of clear white ash.

BELMONT DISTRICT.

Belmont.—*Courier*, April 19: All work at the mine has progressed satisfactorily with fine results during the past week. The winze has been sunk from the 300 level 13 ft in a three-ft vein of quartz, with from 12 to 15 inches of good milling ore. The winze is now sunk 56 ft, the same being in ore all the way and think there is no doubt but that this ore body will extend to the 400 level. A drift from the winze running west 50 ft below the 306 level on this ore body is to be started and continued as long as ore is found. The 300 level drift running from south raise, north end of mine, is showing two ft of quartz with a strong trace of mineral through it. Have advanced some

Continued on page 292.

The Proposed Sacramento River Relief Canal.

The Sacramento *Bee* gives ths following as the latest information upon this important puhlic work: The commissioners of the Sacramento river drainage district, Messrs. R. S. Carey, W. F. Knox and Rohert Eghert, met this morning at their office in this city, 53 J street, for the purpose of examining the maps, plens, etc., of the engineers for the proposed canal which is to serve as a relief to the river.

They found the work progressing satisfactorily under the supervision of Mr. James C. Pierson, who is assisted hy Mr. William Bassett, of this city. The chief engineer of the district is Mr. Isaac W. Smith, of San Francisco. A number of maps have heen prepared, showing the topography of the country in detail, the courses and fall of the creeks, the lins of ths proposed rslief canal, etc.

Probable Route of the Canal.

Ths engineers have apparently done their work well and thoroughly, and it is a very sasy matter for any person of ordinary intelligence to get a very accurate idea of the extent and character of the work to he done by referriug to the maps now ready for the engraver. Tns canal uuder the provisions of the act providing for its construction—is to hegin at Knight's Landing and run iu a southerly direction, on a grade that will utilize the fall of the water, until it reaches tbe "sink of Putah," when it will bear westerly and continue in a line parallel with and ahout six miles easterly from the Vallejo railroad, to the head of Lindsey slough. The course of this slough is then followed to the

Montezuma Hills.

Through these bills a cut is proposed which would be from five to six miles in length, reaching Montezuma slough at Denverton. On the line of this proposed cut through the hills the engineers hored a series of wells, 1,000 feet apart, to determine the character of soil to he encountered in making the cut, should the present survey he agreed upon. It was found to he composed of sand, clay and gravel, which will offer no resistance to the rapid progress of the proposed cut.

Much Valuable Land

Will be drained and hrought into cultivation ehould the proposed canal he constructed with the prohable changes to he suggested hy the euginecr in his forthcoming report. The fall of Putah creek, from near Greene McMahon's ranch, heyond Davisville, to "the sink" averages six feet per mile. At the latter point its hanks disappear, and the water spreade over a large basin, finally finding their way into Sacramento river through Ceche slough. There is a large area of first-class land lying between the sink and the Sacramento river, which is susceptible of heing reclaimed. About eight miles helow Sacramento the great hasin which receives the deposits of Putah and Cache creeks is divided hy a ridge and levee along Babel's slough, which extends out to what is knowu as "Willow Point" some four miles east of the high prairie land behind the town of Dixon. This ridge stops the flow of the Putah waters until the upper part of the hasin is filled, when they run out between Willow Point aud the main land and settle in aud about Big Lake, in Lisbon district, opposite Freeport. Big Lake and vicinity is

The Lowest Point

Between Kuight's Landing and the Montezuma Hills, and is in fact so far as the engineers have ascertained, within a foot or two of the low tide level of Suisun bay. If this be the case, it looks as though there would necessarily etill remain a considerahle district of unreclaimed land in that neighborhood after the canal is constructed.

The above are the principal pointe of information to be had at the present time, but the report of the engineer, which it is expected will ehortly be published, will contain everything of interest in connection with the enterprise, and will doubtless prove a very valuable document. Whether the present proposed canal shall he opened or not, the work done by the engineers will be of incalculable benefit to this part of the State, and will in time well repay for the expense incurred.

THE COMSTOCK AS A LEAD-BEARING MINE.—A French company having purchased the old Telegraph mine at Bingham, Utah, sent out a couple of experts to examine and report on the eame; which business, having been got through with, the company find themselves the owners of a very valuahle property; that is, if the report of these experts may be accepted as conclusive on that point. We had some how got the impression that the Telegraph mine was not of much account, had never yielded any large profit, had, in fact, been run with loss to the owners. However, we glad to hear that it is really a hig thing and would he inclined to endorse it as such, had not one of these experts, by shifting the Comstock over on the base range, betrayed such an ignorance of our mines as tends greatly to impair our confidence in his judgment of the matters.

THE American Institute of Mining Engineers, on Wednesday, March 26th, formally transferred its valuable collection of ores, minerals, aud metallurgical products to the custody of the Pennsylvania Museum and School of Industrial Art.

Southern Inyo.

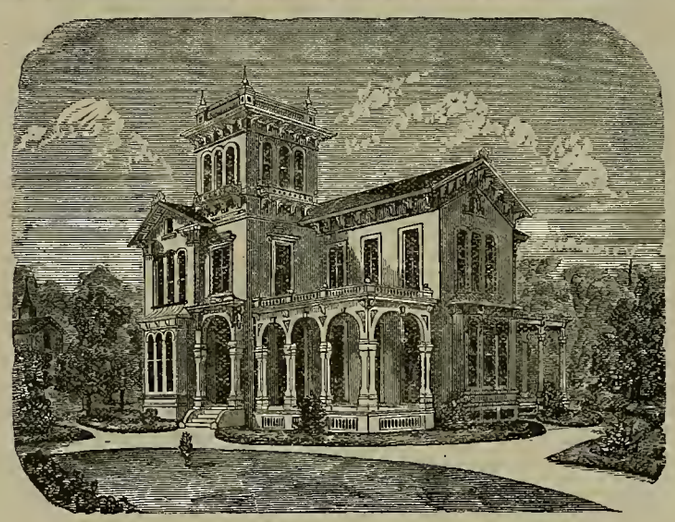
Mr. A. C. Pratt, editor of the *Carson Valley News*, recently made a trip south from Bodie, into southern Mono and Inyo counties, and in an editorial in his paper sums up his views as follows: "It is useless to dwell upon what intervenes hetween here and Bodie. Our readers are already familiar with that section and its resources. Beyond that lies a country known to be rich in mineral, to which we all look with more or less interest, and conjecture when and where tbe next great development will be made. Mining territory is becoming more circumscribed, and people realize that sooner or later this great mineral belt, extending for over 200 miles south, which has been superficially prospected and neglected for years, like Bodie, will attract the attention of men of sufficient enterprise and means to develop its merits. Our readers care little about detailed descriptions of mines, hut 'what do you think of the country?' We think it is a country of the greatest possihilities of any on this coast. The White and Inyo range of mountains, bouuding Owens valley on the east, are kuown to hs rich in hoth gold and silver, from one extreme to the other, a distance of over 150 miles. Benton, Bodie and Aurora on the north have exemplified their richness in a very conclusive manner. Indian district, on the west, has exceediugly bright prospects, and one or two paying miues—the Tower, at least, which is in the same range of hills. Further west is the Mammoth, which is reported to have recently developed an immeuse gold ledge, eight feet in width, at a depth of some 300 feet, and of marvelous richness. Down opposite and west of Independence are some valuable minee of free gold and exceedingly rich. Cerro Gordo has, and is still shipping her lead and silver bulliou, in a quiet sort of way, and almost innumerahle rich ledges of gold and silver-bearing rock have been discovered by men of small means, who have uever been able to work them, and which are never heard from except as the traveler picks up a piece of rock from soue dusty mantelpiece, sparkling with gold, and inquires where it came from, and is told that it came from a mine belonging to Mr. Joues or Smith. He asks 'what are they doing with it,' and the answer is, 'nothing; they bave not means or facilities for working it. If there is ever anything done with the mines in this section they hope to sell.' In this condition everything rests. People seem to be discouraged, and Micawber-like, are now waiting for something to turn up. They know that they have rich mines around them, but they have never yet succeeded (with the exception of Cerro Gordo, perhaps) in bringing them to the notice of the mining world. Bodie development has placed them 100 miles nearer the notice of mining capitalists, and it is not improbable that they may soon attract attentiou. If Mammoth is as good as reported, it will he another gain of 50 miles in that direction. The next step may be the Bishop Creek mines and the Independence country. Bishop Creek is oue of the most fertile valleye on the coast, and capable of supplying an indefinite number of miuing camps on either side. The climate is quite warm, but very favorable for mining and aud agriculture. Owens river supplies ahundance of water, and the Sierras, there as here, have almost inexhaustible forests of timher. We think Owens valley has a great future."

A Rural Mansion.

We give on this page a design for a rnral home which may bs pleasing to some of our readers who are comfortahly furnished with this world's goods, and desire to erect a residence in keeping with their means. The design is in the Italien style, and as may be seen by the hosts of windows it is well planned for a sunny home. It is therefore adapted in this feature to this State, for nowhere else in the world perhaps is sunlight so highly esteemed as here. There is a world of wisdom in this love of sunlight which we hold, and if we plan our houses to catch the sun, and make proper allowance for ventillation, we sball have pure air in abundance, which is a foundation stone of health. Houses range all the way from "grave to gay," from "lively to severe," in the treatment they accord to sunlight and the outer air. Our sunlight is so genial and our atmosphere sò delightful, that we can well afford to give them free ingress to our homes.

It will be noticed that the plan is well furnished with piazzas. These in our warmer districts are great treasures, although near the coast they are of less value. In the interior the shade of the piazza when the sun is high will make the lower rooms delightfully cool, and though at noon the upper rooms will be overwarm, the approach of our cool night air will dispel the extra heat and make them fit palaces for the drowsy god.

Although the design is rather plain in some features, it hes a generous outline and suggests thoughts of spaciousness. To get the best effect of the design the building should he located at a distance from the highway, and be approacbed hy paths and roadways winding among grass plots and shubbery. A grove at the rear would afford a fine background for the picture. The house is well adapted for building of wood, and would probably cost $10,000 or $12,000 if the interior be finished to correspond with the exterior. The design is by J. H. Hobbs & Son, the Philadelphia architects, and they furnish the following description of the ground plau: *A*, vestibule, 11 by 11 feet; *B*, parlor, 15 feet 2 inches by 21 feet 3 inches; *C*, library, 11 feet 6 inches by 15 feet 2 inches; *D*, dining-room, 17 feet 3 inches by 26 feet; *E*, kitchen, 15 feet 2 inches by 22 feet 2 inches; *G*, scullery, 15 feet 2 inchee by 15 feet 2 inches; *H*, china-closet; *I*, front porch; *J*, side porch; *K*, back shed; main hall, 11 feet wide.



DESIGN FOR RURAL VILLA IN ITALIAN STYLE.

GROUND PLAN.

These rooms are all spacious. Thc second floor may be finishcd into six good-sized chambers, with abundant closet room, etc.

INDESTRUCTIBLE STONE.—The quarries lately opened on Bear river contain a stone that is indestructible by fire, but eo variegated in color and stratified that it can be easily worked into mauy forms of usefulness, such as brick, furnace-liuings, etc. An incorporation has been formed, under the name of the "Stockbridge Quarry Company," which is now fairly under the way quarrying out, sawing, planing and polishing this material in any deeired shape required. The stratification admits of slabs heing taken out varying in thickness from one inch to several feet, and so soft when first exposed as to be worked with plane or saw with more ease than a pine board, but soon hardens and becomes suitable for use. It will answer for mantel pieces, table tops, countere, einks, tombstoues, fire bricks, well curbs or any other requirement that brick or marble could be put to. The stone is of many varieties in color, and takes on a very fine polish. Several orders have been made for it for tombstones, and it can be worked out almost as cheaply for that purpose as could be done with boards. Quite a demand is expected in that way. The Idaho company have used several thousands of brick, made from this stone, as a farnace lining, and the Godfrey Mining Co. is also putting it into use for well curbing. The company is now putting up a larger mill than their experimental one, which is to be driven by steam to do sawing, planing and polishing, and working the stone into such shape as customers may order.—*Grass Valley Union.*

Interesting to Anthropologists.

The *Grant County Herald* contains the following letter from Richmond, New Mexico, which will be of interest to antiquarians. A resident here, while excavating an old building for ths purpose of making a cellar, found two skeletons, one of a grown person and the other of a child. The skeleton of the grown person was found about six feet heneath the surfece of the ruins, almost intact. The skull was well shaped, except for a small protuberance ahout where phrenologists locate amativeness. Tho teeth were small and sound. Placed near the skull was found a small olla, containing what seemed to he the thigh hones of a turkey. After the skull was taken from its place, hair was discovered which on examination was found to bs brown. But when exposed a short time to the air it hecame so much dust. The skeleton of the child was found in a niche in the east wall, securely closed by a thin rock nearly two feet squars. The building had evidently heen burned at some time, as all the timbers which were used in its structure were found in e charred condition. Ths timber used was the cedar. Who were the peoplc who once must have bcen so numerous from the mouth of the Gila to its source? The whols valley at ons time was thickly studded with buildings. Nowhere is there a record of any race that had the protuberance on the skull aforesaid. At first it was believed that this was malformation caused by some accident to the skull, but eince it has been assured to be hereditary to the race. The protuberance was ehout the eize of a hen's egg. This rece cultivated tbe soil, because we find corn about the size of the small sweet pumpkin or squash seed, a seed whicb is the exact counterpart of hemp, and numerous kinds of seeds resembliug melon varieties. They had e beast of burden, for we find the teeth of some animal which must bave heen very large. The first European that visited the Gila was Father Nisa, the romancing priest, in 1539. He says that the traditions of the Aztec were full of stories relative to the old civilization, and its fabulous wealth. Historians differ in opinion, but many believe that this people were extinct before tbe Aztec race knew anything about this country. The tradition of the Apaches is that they have been living here about 900 years, snd that when they came they found the ruins about es we find them. If such is the cese, it may have heen several centuriee previoue to the arrival of the Apache, when this people ahandoned the country or were destroyed.

The Vancouver Gold Field.

It has heen known hy some persons ever since the exciting mining times of 1857 that there wes more or less fine gold existing in the smell streams running througb Clarke county to the Columbia, but in their anxiety to make big hauls, the miners all went to the mountains, abandoning the fields where gold was known to exist. Last October, Hein Kulper, an old miner, and J. O. Smith, hoth residents of this city, went out to prospect Burnt Bridge creek, which empties into Vancouver lake, two and one-half miles north and west of this city. They finally set some sluice boxes on land belonging to M. Wintler, Esq., and when the rain would permit, worked off and on for a month, just long enough to clean up a couple of times and demonstrate that there was pay in the dirt. They labored under eome difficulties, as the fall was slight, the weather bad, and the tailings had to he ehoveled out, but they made about $3 a day to the man. Thie set of owners of lands on the creek bottom to thinking, and among them George Tooley went prospecting on the piece of ground nearest the lake, below all the others. He soon demonstrated that there was good pay in the bottom, and continued at work running a ditch to get water, wheu Portland parties heard of the discovery, and came over to look after it. For several weeks negotiations for the purchase of the property by these Portland parties have been going on, and last week a bargain was concluded, the Portland men agreeing to pay $10,000 for Tooley'e property and putting down $600 forfeit to secure the purchase. They also purchased T. J. Wilson's land above the Tooley farm for $2,200. Tooley still retaims the piece above the road where he resides, which is as rich in gold as any other part of the bottom. Whether any mining operations are to be carried on this season by the Portland parties we have no information. Although the existence of these paying diggings hae been known here all winter, no public mention has been made of it for the reason that it would do no good to create an excitement thet would fill the country with a lot of needy adventurers, who could do nothing on their own account, as every availahle foot of mining ground was held by farmers and land owners, without whose consent no mining could be done. Now the field will be developed, and it is certaiu to pay well, without bringing with it the evils of a mining excitement. One or two old miners from the upper country have signified their intention of prospecting the country nearer the mountains this season, and they will find, as Vancouver men have found hsfore them, a ehow in many places, and psrhaps good mining ground.—*Vancouver Independent.*

Agriculture in the Government Surveys.

Our friend, Dr. Sturtevant, of the *Scientific Farmer*, brings forward an important matter when he laments that the government surveys of our vast territorial regions have almost wholly ignored the gathering of important data concerning the agricultural resources, adaptations and possibilities of the new lands which they have traversed. It is true that many of the reports have contained allusions to agricultaral values, but they have been in the main hasty generalizations, wholly subsidiary to the purely scientific investigations which occupy the leading place. The crowning work of the Hayden survey, the atlas of Colorado, it is true, makes more pretentious to industrial value and awards the subject one of its superb maps. Perhaps the failure to give industrial resources the attention they merit, has been owing to the fact that these surveys have been planned and executed by men who thought but little of industrial matters, but it has been a mistake nevertheless, and one which should be corrected in the future work of the government. We agree with Dr. Sturtevant that the scientific value of the explorations should not be reduced, but there should evidently be grafted upon them industrial features. It is true that the gathering of abstract scientific truth is a deed worthy of public patronage, but where it is evidently to the interest of the country to have these waste places utilized and populated, and as the money to execute the explorations comes from the devotees of industry rather than of science, it is plain that facts for practical use should at least stand upon a par with abstract researches.

This boon to workers has, in the case of several prosperous States, been secured by surveys under State patronage. In our own State an industrial survey, as urged by Prof. Hilgard, finds approval among many people. But the new regions which are in the main, the property of the general government, must be made known by the government surveys. It is certainly as much to the interest of our whole people that a new and valuable stock range should be as thoroughly studied as a glacier, and that the irrigation capacity of a river in a dry land should be estimated as carefully as the hight of a mountain. That these facts have not been set forth has been a sin of omission. What has been done is perhaps well, but the other should not have been left undone. In making up an expedition staff, place should certainly be made for men of experience and judgment who could set forth industrial values, while their scientific colleagues were measuring triangles, mapping moraines, bagging buttes and studying ethnology in Indian bones and relics. As a new regime has now been arranged by Congress for future governmental exploration, it will be timely to expand the fundamental plan of these public studies so that points of direct importance to the whole country shall not be neglected.—*Pacific Rural Press.*

The San Francisco *Call* says that the line proposed as the extension of the Central or West Side railroad has been definitely located, excepting at one or two points, and the right of way secured, excepting in cases of a few land tracts owned by non-residents. For the privilege of passing over these lands, the company may be compelled to sue under the law condemning rights of way. In any case, the progress of the work will not, in any way, be hindered. The contract for the grading of the first 10 miles of road from the present terminus at St. Joseph, in Yamhill, to Amity, in the same county, has been let, and work is progressing fairly, considering the state of the weather. Another contract for grading from Amity south will soon be let. The sites for the bridge across the north fork of the Yamhill have been built, and butts set up and piles driven for a pier on the west side of the main stream. The work of driving piles for the bridge to span Cozine creek, near McMinnicke, will commence in a few days. Almost all the timbers for the large trestlee and for truss bridges of the northern part of the road are framed. Over 17,000 ties have been completed, and a special train is now engaged in carrying them to St. Joe, where they will be sent out by construction cars as required. The construction, passenger, baggage and box cars are progressing rapidly at the machine shops of the Oregon and California Railroad Company. The first vessel, with 1,600 tons of iron, left Philadelphia on the 26th of February, and other lots of rails, with car wheels and axles, have left by vessel for San Francisco, from whence they will be shipped by steamer to this city. Another large lot of wheels, axles and other materials for car construction will arrive by the *State of California*, now on her way to Portland from Philadelphia.

Utah and Northern Extension Railroad. This road is completed as far as a point four miles beyond Eagle Rock. This makes the entire length of the water 217 miles. Of this 26 miles have been laid since the 26th of February last, and the road is now about four miles from the point where it will cross Snake river. For this last named point the road has been vigorously pushed since the recommencement of work this spring, with a view to its early completion in order that the iron bridge, now being built East, could be shipped over the road and laid across the Snake river before the month has passed.

Useful Information.

Sights Seen from a Railroad Train.

Some new optical delusions have been described by Dr. L. P. Thompson. Those connected with the railroad may serve to relieve the tedium of travel by affording an agreeable exercise to the mind in endeavoring to explain them. When a landscape is observed from a moving train, all objects to the remote horizon appear to be passing in the contrary direction, those nearest having the greatest velocity. Consequently, if the attention be fixed upon any object at some distance from the line, all objects beyond will relatively appear to be moving foward with the train, while objects nearer appear to be moving backwards. The combined effect is to make the landscape appear to be revolving centrally round whatever point we fix our attention upon. Rain seen from a moving train always seems to be falling obliquely (except in a very strong gale in the direction of the train's motion) in a direction opposite to that of the motion of the train. But if another train happens to pass in the opposite direction, and we look out at this and follow it with our eyes, raindrops falling between the two trains will seem to be flying forward with ourselves. If we stand upon a platform of a station and watch a train approach, the end of the engine appears to enlargo or swell as it approaches, and occupies a larger area of the field of vision. Conversely the end of the last car on a returning train appears to shrink down and contract as it diminishes in apparent magnitude. An observer at some slight elevation above a railroad, seeing two trains pass along simultaneously in opposite directions, will receive the impression of one long train moving round a circle.

Art as an Aid to Industry.—A mechanic working in the blacksmith's shop of the Phœnix Iron Company, at Phœnixville, Pa., visited the Pennsylvania Museum and School of Industrial Arts in Memorial Hall, and took a fancy to the quaint and beautiful work in wrought iron there exhibited—vines, flowers, tendrils, and leaves, wrought by hand on the anvil by the skilled smiths of foreign lands. He not only admired them, but saw in that sort of work the opening of a profitable industry. So at night, in his own house, at a forge improvised for the occasion, he and his brother worked out designs in forged iron—oak leaves, acorns, and the like. Having finished his work, he took specimens to the trustees of the museum, told what he could do, and borrowed models for the continuance of his work. There is already a considerable demand for such ornamental iron work in the decoration of buildings, and it is safe to predict for the new industry and its originators a successful and profitable employment.—*Scientific American.*

To make a Razor Strop—Select a piece of satin, maple, or rose wood, 12 inches long, 1¾ inches wide, and ⅜ inch thick; allow 3½ inches for length of handle. Half an inch from where the handle begins, notch out the thickness of the leather so as to make it flush toward the end. Taper also the thickness of the leather; this precaution prevents the case from tearing up the leather in putting the strop in. Then round the wood very slightly, just enough (say one-twelfth of an inch) to keep from cutting by the razor in stropping and turning over the same. Now select a proper-sized piece of fine French bookbinder's calfskin, cover with good wheat or rye paste, then lay the edge in the notch, and secure it in place with a small vice, proceed to rub it down firmly and as solid as possible with a teeth-brush handle (always at hand, or should be), and, after the whole is thoroughly dry, trim it neatly and make the case.

Emery Belts and Wheels.—A correspondent says that most users of emery belts and emery wheels do not use glue that is thick enough, fearing it may chill before the sand or emery can be spread. In making an emery wheel or belt, if the cloth has never been glued, it should be sized with glue about as thick as lard oil, and allowed to dry thoroughly before applying the glue which holds the emery. Have the emery heated to 200° Fah., and coat the belt or wheel with glue about as thick as molasses and roll it in the hot emery. If a wheel or belt thus treated is allowed sufficient time to become thoroughly dry it will be very serviceable.

Cleaning Sponges.—A gelatinous substance frequently forms in sponges after prolonged use in water. A weak solution of permanganate of potassa will remove it. The brown stain caused by the chemical can be got rid of by soaking in very dilute muriatic acid. An old and dirty sponge may be cleaned by first soaking it for some hours in a solution of permanganate of potassa, then squeezing it, and putting it into a weak solution of hydrochloric acid, one part acid to 10 parts water.

Simple Mode of Silvering Metals.—Small articles may easily be coated with silver by dipping them first into a solution of common salt, and rubbing with a mixture of one part of precipitated chloride of silver, two parts of potassa alum, eight parts of common salt, and the same quantity of cream of tartar. The article is then washed and dried with a soft rag.

New Nickel-Plating Solution not Patented.

In view of the recent decision in regard to nickel-plating, the following information from the *Manufacturer and Builder* may be found of useful interest:

Messrs. Boynton, Wiler & Co., in England, have for sale a new nickel-plating solution, which they confidently recommend for the following reasons: 1st. It is a solution of the double salt of cyanide of nickel and potassium, and consequently not a solution which is used and prepared by the alleged Adams process. 2d. It will plate on all metals directly, including zinc, lead and solder, and penetrates deeply into the pores of the cathode, thereby preventing oxidation. 3d. It will positively plate three times faster than any known process; sometimes in about eight minutes. 4th. It never requires a special regulation by electricity, thereby preventing the burning of the smallest articles by the strongest currents. 5th. Articles to be plated never become injured from oxidation in the solution. 6th. It produces a coherent, tenacious and flexible deposit, superior to any known to science. 7th. No acid dips are required for any kind of work, while Dr. Adams claims that acid dips are very essential for good results. 8th. The expense of keeping the solution in perfect working order does not exceed $5 per 100 gallons per month, if ordinary care is used, as in all other solutions.

They are prepared to sell this solution on favorable terms, thereby dispensing with the license or royalty business altogether.

Cement for Joining Metals with Non-Metallic Substances.—To obtain a cement suitable for joining metals and non-metallic substances, mix liquid glue with a sufficient quantity of wood-ashes to form a thick mass. The ashes should be added in small quantities to the glue while boiling, and constantly stirred. A sort of mastic is thus obtained, which, applied hot to the two surfaces that are to be joined, make them adhere firmly together. A similar substance may be prepared by dissolving in boiling water two and one-fourth pounds of glue and two ounces of gum ammoniac, adding, in small quantities, about two ounces of sulphuric acid.

Wax Pencils.—Now that such enormous deposits of mineral wax have been found in Utah, it may be of interest to point to a minor use of this substance for wax pencils, which, it is stated, are made by an Austrian firm, Messrs. Ofenheim, Griffen Co., for marking and writing on all kinds of wood, linen, cloth, and paper, and as a substitute for chalk for blackboards. It is stated that the marks with these pencils are not obliterated by moisture or rubbing, nor are they affected by acids.

Grease-Spots on Clothing.—In using benzole or turpentine, people make the mistake of wetting the cloth with the turpentine and then rubbing it with a sponge or piece of cloth. The only way to radically remove grease-spots is to place soft blotting-paper beneath and on top of the grease-spot, which spot has first been thoroughly saturated with the benzole, and then well pressed. The fat gets now dissolved and absorbed by the paper, and entirely removed from the clothing.

Good Health.

Care of Children's Eyes.

It is no uncommon thing now to see, or hear of, mere children using eye-glasses, because of some defect of eight. Myopia (for near-sightedness) is the most common defect, and it is said to be manifestly increasing among school-children, in other countries as well as in our own. The eyes of studious children are especially liable to suffer. Reading tires weak eyes, and eyes grow weak or diseased from too steady application to books. There are many disadvantages connected with learning the alphabet in very early childhood, and danger to the sight may be reckoned among them. The eyes of children, like all their other organs and faculties, are adapted to the study of natural objects, or the phenomena of the world into which they have lately come. This study is play to them, and tends to a healthy development of both mind and body. Their introduction to the fine long lines of little black letters in print should not come too early, or too rapidly—not until a love for nature and a faculty for observation have been so cultivated that reading will not be immoderately attractive. Then they must learn to read and study in a proper light, one that shines upon the book or paper, and not directly upon the eyes. A hanging lamp is much to be desired, and those who read in the evening can sit so that the light comes down upon the page from behind them. In gathering about the evening lamp upon the table, those who read should sit so that the light shines upon the hook or paper from over the shoulder—the left shoulder if practicable. The eyes suffer severe strain from reading when lying down. One who is too tired to sit up, is too tired to read. When the body is enfeebled by disease, the eyes are weak sympathetically and should not be allowed close application. Reading in railway cars, or in any place where it is impossible to keep a steady focus for the sight, causes strain and injury to the eyes. Children should be taught to avoid all these injurious practices. Most of the youthful cases of near-sightedness are those who begin to learn piano-playing when quite young, and it seems that the fixing of the sight upon the notes, while the energies are at the same time bent upon the schooling of the fingers, has a peculiar tendency to develop near-sightedness. Ought not a child's music lessen to be made very short, and the hours of practice few and of brief duration? We think so not only for the sake of the eyes, but also for the sake of the spinal column and the nervous system.

Bad Temper and Insanity.

Says the *Popular Science Monthly:* Passionate people—the hasty kind—who flare up in a blaze, like fire to tow or a real to powder, without taking time to inquire whether there is any ground for such a pyrotechnic display, and then get more furious when they find out there was no cause for their fiery feats, may learn a useful as well as a serious lesson from an item in Dr. Blanchard's report of the King's County Lunatic Asylum, that "three men and three women became insane by uncontrollable temper."

We all feel a sympathy for one who has become demented from loss of kindred, from disappointment, and from a hard lot in life; but we can have no such feeling for quarrelsome, ill-natured, fretful, fault-finding, complaining, grumbling creatures, the greater part of whose every-day life tends to make those whose calamity it is to be bound to them, as miserable as themselves. Bad temper is a crime, and, like other crimes, is ordained in the course of nature, to meet, sooner or later, its merited reward. Other vile passions may have some points of extenuation, the pleasure, for example, which may attend their indulgence, but ill-nature—that is, a fretful, fault-finding spirit, in its origin, action and end, has no extenuating quality; and, in the application of the old principle, "with what measure ye mete, it shall be measured to you again," will find a most pitiable end. Therefore, with all the power that has been given you, strive and strive for life, to mortify this deed of the flesh. Watch hourly, watch every moment against the indulgence of a hasty temper, as being offensive to yourself and contemptible in the eyes of your fellow man—contemptible, because for the person who possesses it, and knows it, yet indulges in it, and makes no effective efforts to restrain it, no human being can have any abiding attachment or respect, founded as it is in low morals, or low intellect, or both.

Preventing Seasickness.—Of the many annoyances to which the traveling public is subject at this particular season, seasickness is, perhaps, the most distressing. A perfect cure for this malady would rob ocean travel of half its terrors. No drug, however, has been discovered which acts as a specific. The cause of the sickness is largely, if not wholly, due to the involuntary and unexpected motions to which the passenger is subjected on board ship. These cause undue pressure upon the stomach and liver, and derange the action of those organs. To prevent this, attention has recently been called to an old plan, which is said to be very successful. It consists in regulating the act of breathing according to the pitching or rolling of the vessel, drawing in the breath as she rises, and breathing out as she falls into the trough or the waves. After a little experience the practice, it is said, becomes involuntary. When seasickness has fairly set in, the only thing to be done is to get rid of the extra bile thrown into the circulation, and to allay the irritation of the stomach. For the latter, brandy is the popular remedy, but cool, effervescing drinks are preferable. Champagne is recommended as the best medicine to subdue nausea, and give the necessary tone to the system.—*Scientific American.*

Gases of the Stomach.—In a paper recently read before the Paris Academy of Medicine, the author expressed the opinion that food does not produce gas, and that the gases which are found in the digestive tubes proceed from the external air, the blood and fecal matter; these gases are continually put in motion by the pathological contractions of the muscular fibers of the intestines; expelled by the mouth, they are constantly renewed, and their production may be as incessant in a starving man as in one who is well fed. This symptom of production of gas, therefore, signifies an irritation of the stomach, which is always consecutive to a long-standing gastric dyspepsia. No therapeutic agent need be sought to combat these gases.

Preventives of Lead Colic.—If working in lead, wash the hands several times a day in a strong decoction of oak-bark. Keep the hair short, and (if a painter) wear a clean cloth cap. The clothes should be frequently washed, and the hands also, especially before touching food. Before eating the mouth should be rinsed with cold water. A weak oak-bark decoction should be used as a wash several times a week. The body should be sponged night and morning with cold or tepid water, and the hair thoroughly washed every evening after work. The food should contain a large proportion of fatty substances, and milk should be taken in large quantities.

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The Week.

With tbe near approach of the Constitutional election interest rises to a fever heat, and men of all parties hrace tbemselves for more energetic efforts in furtherence of success and remedy of failure. Which ever way the election goes tbe prospect for California, and for the Pacific coast generally, is a hopeful one. From the propitiousness of natural agencies our prosperity is generally assured. The abundant rains and past good weather have made a bountiful grain crop certain. But it is in mining that the improving outlook is most apparent.

True, stooks are down, but this is not always an unfavorable sign. Without doubt the legitimate field of mining is widening every day. From all our States and Territories come news of extensive prospecting, location of new districts, opening of new mines and large increase of bullion products. The hydraulic miners are especially favored in the unusual ahundance of water. The severity of winter which has so impeded the fall development of many mountain camps, has gradually passed into the more favorahle weather of spring; and from them also the chorus of drills and sledges and of blasting thunder resounds with loudly increasing vigor.

LIEUT. WILLARD YOUNG and command have resumed the work of surveying Great Salt Lake, at tbe place wbere it was discontinued last year.

THE Reichstag has voted the eum of 1,830,000 marks for the further coustruction of subterranean telegraph wires in Germany.

QUEEN VICTORIA has left Italy for England.

A Word More About Investing in Dividend-Paying Mines.

Certain of our Eastern contemporaries affect to regard it as a little strange that the PRESS should have thought it worth whils to caution investors abroad against buying the sbares of dividend-paying mines on this coast. Our remarks in this connection were intended to not exactly discourage the purchase of such shares, but to suggest that the buyers look out that they do not pay too high prices for them under the impression that these dividends are to bs indefinitely continued. We have mines that for a long series of years have yielded steady profits; but they have not generally been listed at tbe etock boards here or elsewhere, nor are their shares in a public way at all dealt in. With the properties that have attracted wide notice through the disbursement of large net earninge and extensive transactions on the stock exchanges the dividend-paying era has not been protracted. These properties have not, in fact, remained long in bonanza. With our exhaustive system of mining this was impossible. The enginery we employ does its work too rapidly. What ore body could long hold out against the depleting forces of these modern agencies and appliances! One after another every dividend-paying mine on the Comstock has by this intensified and energized process been forced over the dead line, there to remain till it recovers the function of profitable production. During the past twenty years a full dozen of these properties have in this manner been relegated to their first sterile and profitless condition. With deeper exploration some of these mines will be restored to prosperity, while others will probably be marked by such persistent barrenness, as will lead at last to their entire abandonment.

And so of our fertile mines elsewhere: attacked in such force their resources must soon show signs of failurc, if they do not wholly give out. So far as the stock of ore in a single mine or many mines is concerned, it is merely a questiou whether, through the employment of these improved mechanisms and methods, it shall be speedily used up, or whether by an adherence to the old ways and meaus its life ehall he extended. If our ore-bearing deposits were few or of limited extent, it might perhaps be best to slacken our pace and be a little more guarded against their waste. As it is, however, with the material in such exhaustless quantity an opposite policy would no doubt be the best, as it certainly is the one which we shall continue to pursue—going on as we have begun, driving this business under high pressure, delivering our mines by the Cæsarean process, and leaving dividends the magnificent hut cvanescent thing tbey are at prcsent. We can take no backward step in this industry. We shall go on doing our lifting and pumping with great hoisting works, performing with a single engine a service for which in the Spanish American mines an army of pcons was required. Our capacious mills will continue reducing the ore for which in Mexico alone 14,000 mules were kept to drive the arastras and tread the patios. Our motto in the future as in the past will be onward and downward, paying dividends when the mines can earn and the mauagers deem it policy to spare them.

To invest in the shares of some of our non-dividend paying mines might not just now be such a dangerous experiment. Certain of these properties under very thorough exploration afford signs of approaching ore devclopments, which should they be realized would cause the price of these shares to advance rapidly. Eastern investors put their money into railroad, coal and other stocks that not only afford no net revenue, but which can in no event be expected to make any great advance on the figures at which they are now quoted. Nor are these stocks free from fluctuations, sometimes quite as extreme as anything ever seen in our mining share market. Shares in the New York Central and Hudson River Railroad, accounted a standard stock the world over, fell ten years ago in a single montb from $192 to $85. The stock of the Panama Railroad, another favorite, stood at $369 per share in September, 1868, and at $49 in June, 1871. Toledo & Wabash Railroad shares fell from $88 in August, 1869, to $1 in July, 1877, and hundreds of other examples of like purport might be quoted. Even gold under the manipulations of Eastern epeculators has been made to tumble at a fearful rate in the short space of 24 hours.

But, after all, we rather incline to the opinion lately expressed by us, that parties in the East desirous of becoming interested in our mines had better engage in the business in a practical way, going in as we do here on the hedrock principle. Let them buy or hunt for mines, and having secured them, open, outfit and work them, taking the chauces of their proving remunerative or a failure. The business is not now attended with much hazard; it can, in fact, by proper care, be made a very sure one. The field is large and open to all. It has been well explored, our pioneer prospectors having penetrated to the remotest parts of it. There is safety everywhere. The dangers that attended early exploration have disappeared, and even the difficulties that at first beset the business have been greatly diminished. The ground has been cleared ready for the planting, and a great harvest awaits those who ehall come to seed it. The stranger should repair first to San Francisco, get posted and then strike out in almost any direction, for go wbich way he will he can hardly go amiss. Our mineral regions stretch interminably away to the north, east and south of us, and from this point can be penstrated for many hundred miles by rail, which besides expediting travel and promoting comfort, greatly lessens the cost of transportation to the interior, hefore one of the heaviest burdens of mining.

Notes on Trinity County.

A Prosperous Year—A Large Out-put of Bullion—New Enterprisee, Etc.

From an old and well-knowu resident of Trinity county, who called upon us the past week, we have been able to gather some very acceptable intelligence touching the condition and prospects of the various branebes of miniug in that remote section of the State, and from which it is not always easy to obtain very full informatiou through ordinary channels. This, in the opiuion of our informant, is likely to prove an exceptionally good year for the mining industries of Trinity, for, while the rains were delayed two months later than usual, more than the average amount of gold dust will be taken out the current year, as the weather of late has been extremely favorable, and a number of new hydraulic mines have this season come into the field as hullion producers. The annual yield of gold in this county has, one time and another, fluctuated considerably. At first it amounted to over $3,000,000. This was when the mining population was large, and extended from 1850 to 1854; after which the yearly out-put gradually fell off till it reached scarcely more than $1,000,000. Some five or six yeare ago the bullion product began to increase, and for the past two or three years has averaged very nearly $1,500,000. It is generally expected that it will thie season exceed that sum, and that the increase will, for several yeare to come, be quite rapid. Next year they count on $2,000,000 at least, many fixing the eum at $2,250,000. The total production of Trinity county to date approximates $100,000,000, ranking it about the seventh or eighth on the list of our bullion-producing counties.

The Quartz Minee.

Besides the additional hydraulic claims that will, for a number of years, continue to be outfitted and set to work, quartz mining in this sectiou of country is destined to grow very eoon into au important factor in bullion production. It is only four or five years eince any attention began to be paid in Trinity to this branch of mining, and, although no very big mines have since been developed nor extensive mills put up, the business is in an excellent condition, as much so, probably, as in any other part of the State. This class of minere have had no aid up there from outside capital, nor, for that matter, have they had any pecuniary aid from home sources, not having asked for nor required it. The auriferous lodes, so far as discovered, do not appear to he very widely distributed, their occurrence in large numhere and marked strength being confined to a few localities; the most noted consisting of the Bullychoop, the Deadwood, and the Eastman Gulch districts. At these places the lodes, without being very powerful, are well formed, and at a depth of 200 feet show themselves regular and persistent, conforming, in fact, to all the geological requirements of true veins. Tbe ores are free milling, and, worked in arastras, have yielded from $30 to $100 per ton; averaging at least $70 per ton. Only one or two small mills have yet been put up, the miners preferriug to work their ores in arastrae till such time as they have fully tested their lodes and determined their capacity for ore productiou By pursuing this policy they have opened their mines to a considerable depth, know just what they have got and what they want; have made some money, are out of debt and own their properties wholly themselves. No parties have lost any money in quartz mining in Trinity. They have no deserted tunnels, ruined hoisting works nor great crushing mills standiug idle up there. There is also an absence of incorporated companies with millions of capital stock, assessing shareholdere and wasting the money iu a thousand questionable ways. Many of the quartz miners now require hoisting works and some increaee of milling capacity, but they will he able to provide these themselves, and mostly from the net earnings made from their mines.

From this showing it would certainly look as if quartz mining in Trinity was in a healthful condition. There might be some inducements for parties with larger means to engage in the business there; but they are not great, the lodes and the ores heing of such character and the natural facilities so good, that the locator is able, as a general thing, to work them succesefully on his own account. In the future this business will no douht continue to advance with a slow and steady pace, reaching ultimately very respectable dimensions. Quartz can be mined and milled in that county as cheaply as anywhere else on the coast, tbe country beiug well watered and timbered, and the climate such that operatione can be successfully prosecuted at all seasons of the year.

Hydraulic Mining.

The most of the placer mining in Trinity is done by the hydraulic method, which is now in use throughout a belt of country stretching along the Trinity river for 60 or 70 miles. Never has there been greatsr activity in this branch of the business than at present. Every company has plenty of water, and all are running day and night, week days and Sundays—hydraulic miners, nowhere, in fact, suspend work on the ssventh day during the water season. So auxious have the Trinity miners shown themselves to make the most of the water while it lasts, that some of them have not evsn stopped to clean up, none having done so this spring as often as usual. Ths result has been, that whils mors gold dust is being taken out, less has bssn shipped than in ordinary years. Business, however, is good, prosperity with the miners meaning there prosperity for all. At this time thers are but few idle men to bs seen in Trinity; all are busy, either running their own claims or working for others, lahor being in active demand at fair wages.

Some of the Live Mines.

Among the more largely producing hydraulic compauies iu this county are the McGillivray, the Weaverville ditch, the Buckeye Mountain, Oregon Gulch, Dixou'e Bar, etc., each of whicb cleans up yearly from $20,000 to $80,000, three-fourths of it being net profits. A good part of the Dixon's Bar Company is made np of residents of Oakland. They built a ditch and opened and outfitted their ground last year at considerable expense. They are now washing with a full head of water, and cannot fail to do well, as their gravel is known to be rich. The Buckeye company, who own a splendid water right, have also completed a large ditch delivering water upon their extensive gravel claims. Some portions of tbeir ground, more especially that at Boalt'e hill, have in times past been distinguished for an immense production of gold dust. But the great body of their richest gravel has not yet been reached, and cannot be until the tunnel now being driven is completed. When this work is finished it will probably open up one of the most fertile cbannele ever explored in Trinity county. Aside from this the company own eeveral hundred acree of deep gravel banke that everywhere ehow good hydraulic proepects.

New Enterprisee.

On tbe lower Trinity a number of new projects are about being carried out, eome of whicb are of considerable magnitude, and when completed will greatly increase the bullion product of the county. The Slide Creek company are building a ditcb and flumes for taking water from the main river and conveying it on Rattlesnake bar, where they have a large amount of rich gravel through which an old buried cbannel is supposed to run. They have a sawmill which cuts all the lumber required for tbeir various purposes. Another party in the same nighborhood will soon begin cutting a ditch also to take water from the eame stream and deliver it on a bar at the mouth of Slide creek, where extensive washing operatione will be carried on. This bar containe 25 acree of good gravel ranging from 30 to 60 feet in depth. This water will be taken across the Trinity in a flume supported on trestle works. Two or three smaller companies are in like manner engaged here bringing water upon their claims, taking the same from either the main river or some of its emaller branches. The most important enterprise lately set on foot in this vicinity is, however, one deeigned to introduce a heavy stream of water on

Taylor's Bar,

An extensive body of gold-bearing gravel lying on the east eide of the lower Trinity, about 36 miles northwest of Weaverville. This har has always been noted for its richness, the gravel yielding a higher percentage of gold than almost any other along the river. Being owned, however, by one of the old-time minsrs who lived upon it with his family, content so long as he got enough from it to afford him a comfortable subsistence with little labor; it has remained up to the present time in very nearly its original condition, just enough work having been done to prove its value without diminishing to an appreciable extent its productivs capacities. This bar covere an area of some 160 or 170 acres, two of the buried gold-bearing channels running its entire length, with a third lying a few hundred feet further back and at a higher level, but within the limits of the claim. These channels have been opened with tunnels and proven to be of the most fertile character, the dirt taken from them yielding from $5 to $10 to the cubic yard. Not long eince the former owner of this property, E. B. Barnum, not foreseeing the great impetus likely so soon to be given to hydraulic operations on the lower Trinity, disposed of the eame to Eastern purchasere for $125,000, the principal huyers being residents of Indianapolis. It is a property that, in the opinion of our informant, never ehould have gone out of the hands of Californians, and would not, if they had been alive to their own interests. It is the case, however, that Californians too generally want only mines suited for epeculative purposes, to whicb these gold-giving hydraulic hanks are not well adapted. There is not enough of the element of hazard about them for this. It is not convenient to go long or short, or to effect corners on the shares of mines that yield with so much steadiness and certainty. But it matters not to the Trinitarians who gets possession of these lifeless claims—animates and spends money on them, and thereby enlivens trade and invigorates business generally; securing for themselves in the end large and lasting profits. The gold is in these bars along the Trinity. For 30 years

the old crop of miners thers have been well aware of this fact, but they havo not had the energy to open up these deposits and bring water upon them. If now other parties will coms in and accomplish this work, it will he for ths good of all, as its performance will necessitats the sxpenditure of money, create an additional domand for labor, and return a thousand fold to the investors.

Importance of Beginning Right—A Man Who Knows His Businees.

This property was hought for these Eastern parties by I. M. Taylor, a wsll-knowu mining expert in his city. It is not from him, however, that the bar derives its name. It was callsd after an early pioneer on the lower Trinity, and who having bsen among the first to work on this har left it ths heritage of his nams, while he, after haviug enriched himself drifting out the dirt along its edges, floatsd away into the forgotten aud unknown. Our San Francisco sxpert having bsen callsd upon to take a look at this grouud, wsnt up, examinsd it carefully, and without dickering or asking qusstions took it so quickly that the old man Barnum had not time to advancs his price, as his neighbors thought he ought to have done.

Appurtsnant to this ground is a franchiso to the entirs waters of Frenoh creek, a large stream hsading in the Salmon mountains and emptying into the Trinity a little above Taylor's bar, an appendage that alons is worth more than the present owners gave for ths whole property. If Taylor's har, with this water right and the rich gravel it commands, wers located in Nevada, or other of the mors contral mining counties of the State, it would be considered cheap at three or four timcs the price givsn for it by these parties. But it is worth none the lese where it is, as rssults will prove when the water of French creek shall begin to do its work on the auriferous banks and along the old channels of this splendid property. So much for sending the right kind of a man to do thie sort of work, the most fatal mistake made by mine investore lying usually at the very threshold of proceedings. If a miniug property be devoid of solid merit, or if a price be paid for it greatly dieproportioned to its actual value, it is vain to hope for a favorable issue, however ably and economically it may afterwards be managed. Hence the importance that these errors be at the start duly guarded against. I. M. Taylor went to Trinity several years ago, and was alike fortunate in pointing ont some of the best things there. He was the first man of advanced ideas to visit the Altoona cinnabar district in the northern part of the county, the subsequent history of which has fully verified what was said by him on a subject then so little understood.

The new proprietore of Taylor'e bar have already taken active measures for equipping the ground and bringing water upon it, and as they have ample means they design doing this work in a manner superior to anything yet seen in that part of the country. The services of a capahle and experienced euperintendeut have been secured, the surveys for the new ditch are under way, and preparations being made for the erection of a sawmill for cutting the lumher required for flumes, sluices and other purposes. These works will be pushed to completion, including the cutting of a large sized canal, as rapidly as possible, aud with a view to having the whole ready for active use by the commencement of another water season, when it ie expected that such clean-ups will be made here as will astonish even "old Trinity." While there are still good openings for the investment of money in gravel mines up there, they are not numerous, the water being all taken up and minersas a general thiug holding their claims at pretty good prices.

A Mountain Sinking.—It is not uncommon in the Gulf and Southeastern Atlantic Statee for large bodies of land to eink below their original levels, but such phenomena have generally occurred in the low and sandy countries. The Toccoa (Georgia) *Herald*, however, reports the subsidence of a whole mountain in that country which is composed of, at least, half rock. A heavy storm was felt on the 20th of March accompanied by thunder and lightning and a terrible ehaking of the ground. Immediately following this, it was found that the whole north side of Chattoogo mountain, sloping down at an angle of 45 degrees to the Chattoogo river and 1,200 feet in hight, was gradnally sinking. There was a break near the top, and at one point, over the top of a eloping ridge, a perpendicular rock showed itself, the depth of which was about 16 feet and the extent 30 or 40 acres. The bank was in the form of a horseshoe, the toe being at the top of the mountain. Trees were standing with their roots up, and large stones cast out upon the surface. About three years ago an earthquake cracked the mountain at the point where the present break occurred, but no notice was taken of it at the time. Some fear is manifested by the inhabitants as to the resulte of this subsidence and the depth to which it may extend.

A man was arrested in San Francisco for offering to sell 60 votes to be used as the purchaser might desire.

R. D. Hume will contract to put 3,000,000 salmon into the Columhia annually, for ten years, at $5,000 per year.

The total insurance on the loss by the Eureka fire foots up $136,087.

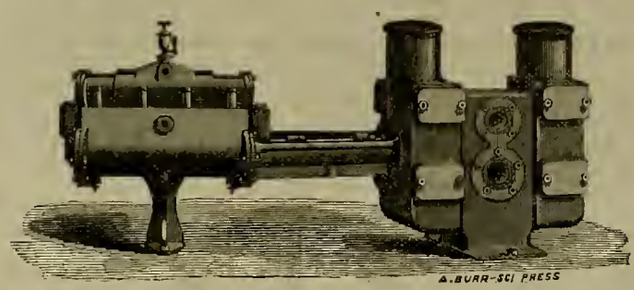
Dow's Improved Steam Pump.

When direct acting steam pumps (or suob as did not reqnire au eccentric to move the valve) cams into use, it was deemed sufficient if the piston could be made to reciprocate with a distant approach to certainty of action, wbich would not now be tolerated; it being held only reqnisite that it would continue working under the constant eye of an engineer without much of any variation of duty or coudition. As use and experience increased, improvements were suggested and made as new requirements developed thsmselves, until we have now several recognized makers of direct acting steam pumps which are generally accepted as the standard.

In making thcse pumps, all the makers have followed one direct principle—that of operating the main or auxiliary valve by means of positive contact through intermediate mechanism of reciprocating pistons or connections with the main or auxiliary valves. While thie has given positive movement to the valves, yet it has been impossible to adjust this line of contact to meet the reqnirements which are shown under variations of work or steam pressure. That is, without mechanical adjustment, the time of contact of operating parts is (not allowing for lost motion by wear or otherwise) when the piston is at a fixed distance from the end of its stroke; and this, although the pump may act comparatively well and emoothly when being operated at fixed speed, any increase of speed and work leaves the distribution of steam behind its proper timo. Thns, in increasing the speed of the pump, there is an increase of momentum in the reciprocating parts, and consequently, an earlier action of the valves becomes necessary in a really efficient direct acting steam pump. Thus an increase of work and speed demands more port opening for admission and exhaustion of steam; but the action of valves which are moved hy mechanical contact is directly the opposite of this, heing not only later in action but more limited in movement. This naturally results in two losses: contraction of steam opening for admission of steam to the piston, thereby not ohtaining full benefit of the boiler pressure; and secondly, by decreasing the exhaust opening, creating excessive back pressure ahead of the piston, requiring additional hoiler pressure to overcome it. And therefore, steam pump manufacturers recognizing this, to tbem, insurmountable evil, naturally increase the size of the steam cylinder above what is really necessary to do the work, providing the distribution of steam could be positively controlled.

Indicator carde from steam pumps by several of the leading manufacturers shows this to a very marked degree. Another source of loss is the large amount of clearance space which has to be given to steam pumps of this kind by the necessity of making provision for lost motion; the actual stroke of the pump when new being much less in some cases than that called for by catalogue, and there is consequently an excessive expenditure or waste at each change of motion. This prevents any cushioning by exhaust steam and also by live steam successfully under any circumstances without filling immense clearance spaces, and consequently increased cost of fuel. Tc produco the best results in pumping, the column of water should start slowly and the valves in the pump bo allowed to seat and open slowly. This can only be done by a proper motion of the pump piston, which is actuated by the steam piston through a proper distribution of ths steam. This is most clearly shown in the action of the steam pump patented recently through the Mining and Scientific Press Patcut Agency by Mr. George E. Dow, aud mannfactured by ths Hops Iron Works in this city.

In this pump, neither ths piston or rod, or any tappets, arms or cams, come in contact to operato tho auxiliary or main valvc, aud yet the action is positive and always accommodating itself to the varying requiremsuts of the work. The valve movement is never behind, but is increased in velocity and length of travel by increased speed and work; at the same time the increased momentum is compensated for by the arrangement for compressiou and cushion by tho exhaust bringing the pisten gradually at rest, allowing the valves in tho pump to gradnally seat with tho least possible amount of slippage and as gently opening without perceptible concussion. A comparison of the indicator diagrams taken from this steam pump—both steam and water cylinders, with diagrams from other well-known makers, we are informed, showe marked superiority in the action of the valve motion. The clearance is reduced to a minimum in this pump, being less than two per cent., and as no provision has to be made for lost motion, the piston has the same stroke when new as when old.



DOW'S IMPROVED STEAM PUMP.

No live steam is used for cushioning or operating the supplementary piston, so that losses in other pumps are reducod to nothing in this pump through this canse. It is claimed that by the automatic adjustment of port opening no wire drawing on the steam side or back preesure on the exhaust side, exists; consequently, the steam cylinder in this pump is made of less area in proportion to the area of the pump piston than can he made by other huilders for the same duty. The pump valves, air chamber, piston and channel ways have received serious attention, which indicator diagrams provo are smooth, noiseless and economical in action.

These pumps are manufactured of ordinary sizes for general hoiler feeding and of any special sizes for particular work. In presenting these pumps to the public, Mr. W. W. Hanscom, the manufacturer, does not assume or pretend that one kind of pump will perform every kind of work with the hest economy, but prefers to construct the pumps for particular service after knowing the duty required and conditione under which it is to operate. In euch cases he guarantees good satisfaction.

The Sutro Tnnnel sub-drain will contain two separate compartments each 18 hy 24 inches in the clear. It will he ahout four miles in length, and will require an immense quentity of lumber, the material used being three-inch plank.

Grizzly bears are making things lively for cattle on the Liebre rancho, Los Angeles county.

Lincoln's Patent Axle.

We present herewith engravings which represent an improved axle recently patented, through the Mining and Scientific Press Patent Agency, by Edgar E. Lincoln, of San Joso, Santa Clara county. By the construction shown, the axles aud axle boxes may bo united and the size of tho journals hs reduced to very small proportions. It is rendered perfectly dustproof and easy to lubricate, aud the space which the box occupies within the huh is reduced so that the mortises for the spoke tenons may bs sxtcnded near tho center, thersby greatly strengthening the important points, while any oil or lubricant is prevented from finding its way from tho journal to the interior of the hub to loosen tho spokes.

Fig. 1 is a longitudinal section of the box, showing the manuor in which it is fittsd into a hub, and also ths journal. Fig. 2 is a view of thc axls and socket.

A is thc axle, which may be mads in any of the desired forms. It is here shown as squars, with au enlarged hsad, *B*, upon it. A hole, *C*, is hored centrally into the end of tho axle, and the spindlc or journal, *D*, is fitted to turn within this nole or hox, which is formed on the axle. In order to retain it in place, a groove, *E*, is turned around the axle, and the point of a screw or pin, *F*, enters the groovs, or in soms similar manner proveuts the spindls from being drawn.

A cylindrical box, *G*, formed upon the spindle, is exactly fitted to the enlargement, *B*, which it sncloses, when the spindle is in placs within the axle, and it will hs seen that ths principal portion of the strain, caused by the side motion of the wheel, will be transferred directly from the box to the axle through the enlarged head, *B*, and will prevent breakages at that point where axles usually give out.

The spindle, *D*, may be made very small, serving, as it does, only as a guide and to hold the box to its place upon the part *B*. The box, *G*, enters the hub but a short distance, having a sufficient space between it and the outer end of the hub to allow the mortises for the spokee to extend towards the center much further than when the usual axle box is employed, extending entirely through the huh, and this materially strengthens the spoke tenons.

A slender extensiou, *H*, from the end of the hox may pass to the outer end of the hub, and a nut upon its outer end holds the box in place and prevents its coming out.

By this construction, the inventor is enabled to make a strong, solid connectiou between the wheel and axle. The peint at which the strain comes most heavily is enlarged, and there ie less liahility to breakage, whilo the spindle itself is very slender, and will consequently run with less friction. As the hox enters the hub but a short distance, it does not occupy the spacc neeclcd for the spokes, and at the same time the wheel will be very steady in its movements.

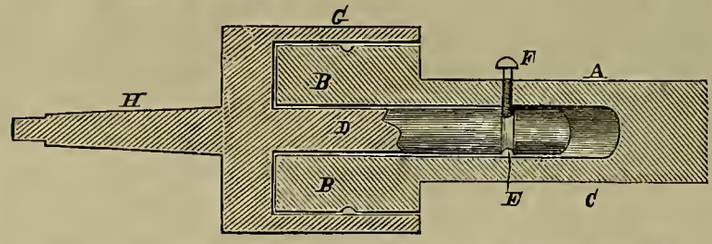


FIG. 1. LONGITUDINAL SECTION OF LINCOLN'S IMPROVED AXLE.

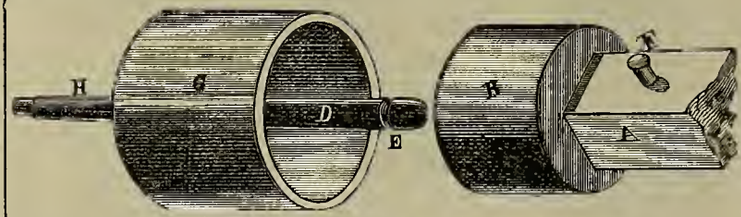


FIG. 2. VIEW OF AXLE AND SOCKET.

Quartz Mining near Home.

While tbis branch of business is making satisfactory headway throughout all parts of our mining domain, it appears to be advancing in certain localities with especial rapidity. Foremost among these stands the Bodie district, where extreme activity seems combined with a look of permanence not often seen in even the most hrisk aud long-lived camps. Bodie stands no longer in the category of experiments. Its success is pretty well assured. Through this district strikes a tier of gold-hearing lodes, some of which have now been extensively worked for over two years, and yielded at a satisfactory rate. Others are in course of development, some having been advanced very nearly to a productive state. In the course of a few months there will probably be twice as many mines turning out hullion as there are at present; and as the principal ore hodies appear to hold their proportions well in depth, and more mills are in course of crection, the shipments of gold from this district ought to aggregate two millions within another year.

And the important mineral discoveries of Mono county are not being confined to Bodie. In the Snake aud Indian districts, further south, a great number of valuable ore deposits have lately heen found. Some of those in Snake, helonging to the Mammoth company, are of extraordinary dimensions, and carrying a great quantity of ore of high grade, for the reduction of wbich this company have put up a mill of large capacity. In the Esmeralda district such encouraging prospects are being met with as promise to restore life to that ahandoned locality, and briug to it, if not such a rush of population, a more permanent prosperity than it has ever yet enjoyed. Over at the Dunderberg mine, northwest of Bodie, another old camp is likely to be resuscitated, this being unquestionably a property of great magnitude and merit, only requiring a trifling expenditure to start it off on a long aud prosperous career.

In the counties along the main gold helt west of the Sierra, quartz mining is also looking up, engaging more attention aud making hetter returns than ever before. In Tuolumne and Amador a very noticeahle onward movement has lately taken place in this industry, and even in the extreme northern part of the State it is getting a foothold from which it will not be likely to slip in the future.

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CAUTION

To Hydraulic Miners.

The public generally and Hydraulic Miners especially are hereby notified that any parties making or using the contrivance known as the HOSKIN DEFLECTOR will be prosecuted to the full extent of the law, said machine having been declared by the U. S. Circuit Court an infringement upon my patent, the

Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

HENRY C. PERKINS,

North Bloomfield, Nevada Co., Cal., October 1st, 1878.

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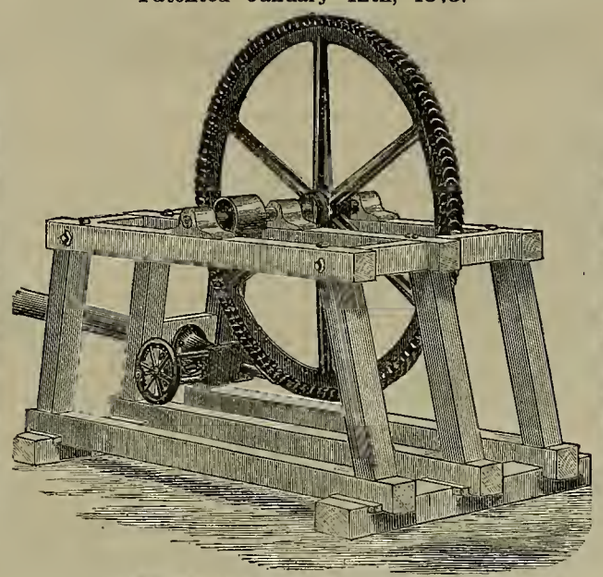
This Wheel possesses more power for a given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.



This Wheel possesses more power for a given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.

The KNIGHT WHEEL is used in the following named Mills and Hoisting Works, to which the Public are referred:

1-Eight-foot wheel, running Oneida Co.'s Mill, Amador county, Cal.; 60 stamps. Rob't Robinson, Supt.
1-Eight-foot wheel, running Con. Amador Mining Co.'s Mill, Amador county, Cal.; 40 stamps and two Hepburn pans. David Davis, Supt.
1-Eight-foot wheel, running Lincoln Gold Mining Co.'s Mill, Amador County, Cal.; 40 stamps.
1-Eight-foot wheel running pump at same company's mine. S. D. R. Stewart, Supt.
1-Eight-foot wheel, running Keystone Con. Mining Co.'s Mill, Amador county, Cal.; 40 stamps.
2-Four and one-half foot wheels, used in hoisting by reversible water power at same company's mine. O. C. Hewitt, Supt.
1-Four and one-half foot wheel, running Original Co.'s Mill, Amador County, Cal.; 40 stamps, one pan, one rock-breaker. J. R. Johns, Supt.
1-Four-foot wheel, running Gover Mining Co.'s new mill, Amador county, Cal.; 20 stamps.
1-Eight-foot wheel, running same company's old mill; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running Talisman Mining Co.'s Mill, Amador county, Cal.; 10 stamps.
1-Eight-foot wheel, hoisting and driving pump at same company's mine. John Tregloan, Supt.
1-Four and one-half foot wheel, running Bunker Hill Mining Co.'s Mill, Amador county, Cal.; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running St. Patrick's Mill, Newcastle, Placer county, Cal.; 15 stamps. Jno. Townsend, Supt.
1-Eight foot wheel, hoisting and running pump, compressor and hoisting at Sheba Silver Mining Co.'s mine, State of Nevada.
1-Four and one-half foot wheel, running Luck Q. M. Co.'s Mill; 10 stamps; Oregon.
1-Four and one-half foot wheel, running Republic Mill, Nevada county, Cal.; 20 stamps. E. H. Dyer, Supt.
1-Six-foot water wheel runuing at the Plumas Eureka Mill, Cal., 48 stamps, 2 pans, 7 ore-breakers and 22 concentrators.
1-Eight-foot water wheel running 40 stamps for the same Company. Wm. Johns, Sup't.
4-Six-foot water wheels running the Sierra Buttes Mills, Sierra Co., Cal. Wm. Johns, Sup't.
2-Six-foot and 2 four and one-half-foot wheels running Soulsby G. M. Co.'s Mills, hoisting and pumping works, Sonora, Tuolumne County, Cal. J. Leechman, Sup't.
1-Six-foot water wheel running Providence 20-stamp mill, Nevada City, Cal.
1-Four and one-half-foot wheel running DeFrees Mill, Tuscarora District, Nevada.
1-Six-foot water wheel running 20 stamps at Julian mine, Newcastle, Placer Co., Cal. A. H. Schnabel, Prop'r.
1-Six-foot water wheel ruuning Mammoth Mill, 30 stamps and 14 pans and ore-breakers, Mammoth Lake District, Mono Co., Cal. Clark, Sup't.

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A Cheap and handy Drying Machine, within the reach of every farmer and fruit-raiser, with which they can dry their own fruits at home, without extra help and at very small expense Fruit can be taken DEAD RIPE and successfully dried in the Boswell, because the atmosphere in which it is dried is heated by DEFLECTED HEAT AND RETAINS ALL THE OXYGEN IN ITS PURE STATE, which is as essential for preserving the fruits as for its growth and maturity on the tree; besides, the entire nutriment and flavor are retained. Fruit dried in the Boswell will gain from 20 TO 40 PER. CENT. IN WEIGHT and 30 PER CENT. IN QUALITY over any other method. Also,

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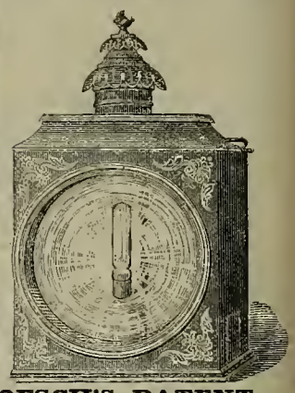

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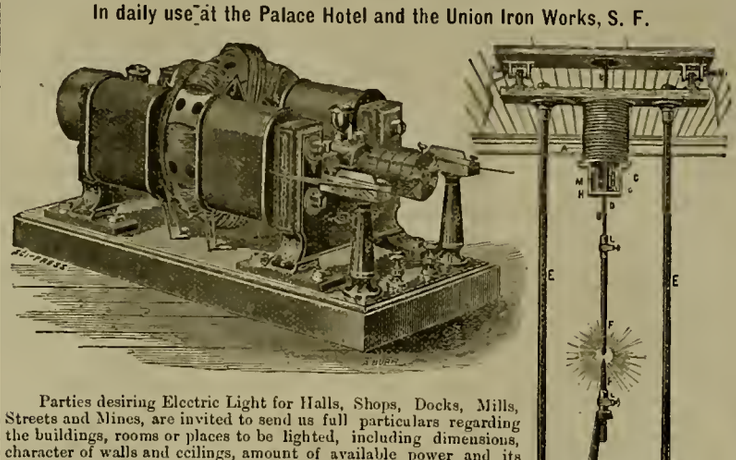

Parties desiring Electric Light for Halls, Shops, Docks, Mills, Streets and Mines, are invited to send us full particulars regarding the buildings, rooms or places to be lighted, including dimensions, character of walls and ceilings, amount of available power and its location, amount of light now used, character of work being done, length of time light will be needed continuously, etc.
With these items before us, we will make a proposition to furnish a COMPLETE OUTFIT OF ELECTRIC LIGHT, put it in perfect working order and guarantee its success and permanence. Address all communications,

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Ingersoll Rock Drills.

In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

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Is Lighter and more Easily Adjusted than any other Drill.

Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.

MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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Hoisting Engines, Diamond Pointed Rock Drills, Manufactured by M. C. BULLOCK.

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Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

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Author of— SAN FRANCISCO.

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Coats of Arms, Crests, Monograms and Masonic Inscriptions Carefully Engraved.

SAN LORENZO, December 6th, 1877.

MESSRS. DEWEY & CO.—*Gentlemen:* I received the Letters Patent for my invention on the 6th inst., and beg to thank you for the gentlemanly and business-like manner in which you have dealt with me from the beginning of my application. I shall always feel it a pleasure to recommend you to all I come in contact with who need Letters Patent. Respectfully, WM. DALE.

Continued from page 285.

18 ft. On same level running from shaft have made but 10 ft, the vein matter is getting softer.

HIGHBRIDGE.—Have connected the north and south drifts on sixth level. This level connects with drift in Belmont mine 196 ft south of shaft. Had advanced seventh level 17 ft north when water came in in such quantities that it was thought advisable to discontinue work until arrangements could be made for hoisting it. They had commenced a crosscut in sixth level, finding some very rich ore, and when suspended the indications were very favorable for finding a large body before the hanging wall was reached. Before commencing work in these levels it will be necessary to sink a sump, which will enable them to raise enough water for the boilers, saving the expense of hauling it, as previously done. The next work on these levels will be to finish crosscutting on the sixth and crosscut to and across the seventh level north of shaft. The mill is running as well as usual.

EUREKA DISTRICT.

THE HAMBURG.—*Sentinel* April 26: West crosscut on 600 level has been extended 18 ft, the face being in broken limestone, with seams of iron through it. East crosscut from south drift, on 600 level, is now in 22 ft, almost the entire face being in iron, with seams of good ore mixed through it. The stopes above the intermediate drift are looking very well, and are yielding a considerable amount of first-class ore.

THE FOURTH OF JULY.—Work was resumed on the 14th inst. The stopes above the tunnel level are looking very well, and yielding a considerable amount of first-class ore. On the north side of the old inclined winze they have found a vein of gray carbonate ore, about two ft wide, that is of good quality. They have somewhere near 25 tons of ore, already sacked, on the dump ready for shipment to the furnace, a considerable quantity in the mine, already broken, and will commence shipping ore to the furnace at an early day.

EUREKA CON.—There is no particular change to note in regard to the mine. The ore bodies are holding out well, with very fair prospects in the lower levels for developments that will keep the mine on a paying basis for some time to come. The following work has been done in the several levels: Fourth level—North crosscut from main drift continued 22 ft, and is now in 75 ft. Fifth level—East drift from cave continued 10 ft, and is now in 416 ft; started lateral drift running east and made 18 ft. Thirteenth level—West drift from station continued 30 ft, and is now in 300 ft; started drift running west from crosscut No. 1, and made 10 ft.

GOOD HOPE DISTRICT.

MINING NOTES.—*Silver State*, April 19: Important developments have recently been made in the mines of Good Hope district. In the Silver Brick, at a depth of 65 ft, the ledge has widened out and carries considerable ruby, black sulphurets and native silver. The Buckeye, at a depth of 25 ft, is three and a half ft thick, and 14 inches of it is rich in black sulphurets and wire silver. The Aurora, the oldest claim in the district, has been sold to San Francisco capitalists for $30,000.

PARADISE DISTRICT.

SPRING CITY NOTES.—The working force on the Paradise mine has been reduced. The reasons are the accumulation of ore on the dumps and lack of milling facilities. This company have over 1,500 tons of good milling ore on its dumps, not rich enough to ship without assorting, but good paying ore for a mill of its own. There are four tunnels, within a distance of 1,000 ft, in on the ledge from 50 to 170 ft, in all of which, the top, bottom and face is in good ore. In fact there seems to be no end to the ore now in sight, and a piece cannot be broken off anywhere that does not show more or less mineral. Two mills, one of 10 and the other of 20-stamp capacity are to be erected in the canyon this summer. The Bullion is an immense mine—12 to 15 ft wide. A force of eight miners are working it and taking out great quantities of very rich ore, which, for lack of milling facilities, must be piled on the dump. The Big Prize and Rough & Ready are each working a small force of miners, and while piling up some good ore, are developing excellent mines. Work is suspended for the present on the Mount Rose and North Mammoth, pending the arrival of a new superintendent, who is expected daily.

REESE RIVER DISTRICT.

WESTERN NYE.—Grantsville *Sun*, April 26: The Illinois mine has been opened up to a depth of 450 ft. At a depth on the vein of 100 ft a tunnel has been run in several hundred ft, and from this tunnel level, winzes have been struck at different points. The ore vein is from two to eight ft in width. The ore is principally carbonate of lead and carries a large percentage of silver. There is a 10-ton furnace at Lodi. The property of this company worked successfully until the company got into its financial troubles and was obliged to shut down.

AT THE TYBO.—About 30 men have been discharged from the furnaces; caused by the shutting down of furnace No. 1. Should No. 1 again resume work, the same number of men will be put on as soon as she does. The mine and one furnace are still running as usual. The men were paid on the first of the month, which put considerable coin in circulation. Little confidence, however, is expressed in the permanence of the present arrangement and a great many are leaving Tybo.

ARIZONA.

GLOBE DISTRICT NEWS.—*Silver Belt*, April 11: The proprietors of the Golden Eagle are going ahead with the development on their claim. They are now arastraring several tons as an experiment, and if satisfactory results are obtained, will have several more worked at the Haskin mill, provided arrangements can be made to run it through, it being gold ore. Mr. Thomas Newland left yesterday for the Pioneer mine, 16 miles south of Globe, accompanied by Frank Barbell and Epply Bros., to begin work on the Pioneer South. They propose to commence a tunnel at the bottom of the gulch intersecting the ledge and run in 300 ft. At that distance they will have attained a depth of 150 ft, which will give them stoping ground to take out several hundred tons of ore. In event of the mine proving to be what they anticipate, they will then arrange to have a mill erected in that vicinity, and will put up hoisting and pumping works.

MOHAVE COUNTY.—Cor. *Sentinel*, April 19: The Moss mine is undoubtedly sold. Mr. Hitchins lately passed through here with Mr Randolph, the expert, to examine the mine, though he said the mine was sold whether the expert's report is favorable or not. The Mineral Park mill and Keystone mine have been sold to a company of brokers on Wall street, New York, by Ben Spear, and he has gone there to get the money. The mill is in operation, and turns out a fair quantity of bullion. They charge $50 per ton for working, so the ore has to be rich to pay; this short run has been very successful for the miners, or rather chloriders.

LYNX CREEK.—*Enterprise*, April 26: The placer miners are still taking out considerable gold, but water is becoming very scarce, and unless it rains before long sluicing for the season will cease in this camp. The Thunderbolt mill is running day and night. The company at present have in their employ 27 men at the mine and mill together, and the work is satisfactorily carried on under the supervision of Major Dake. There are quite a large number of men prospecting in Walker district at present.

PATAGONIA.—*Star*, April 24: The recent discoveries made by Hershaw, Fea and others, are developing immensely rich. The ledges are mammoth in size, and 10 ft sunk on them shows solid metal, ranging from 3 to 18 ft in width. The discoverers are working silently, but it is the greatest discovery yet made in the Territory, if at depth they prove only one-fourth of the surface showing. Assays run from $70 up to $2,600 in silver. There are nine locations, and all within one and a half miles of inexhaustible wood and water.

SONORA.—The mines of the Altar gold and silver mining company, in Sonora, are developing fine ores. The level which is being run in the 60-ft shaft has struck a rich body ore assaying over $2,000 per ton.

Silver With the Gold.

[Written for the PRESS by A. B. PAUL.]

In my former article under the above caption, there was an omission of both dollar and per cent. marks—as one set of figures gave the gold and silver in dollars and cents, while the other was in *per cent.*

In order to make the matter more clear, I will not only repeat the figures, but enlarge on them, by giving assays, which I have since found. Thus, assays of *tailings* in dollars and cents:

	Gold.	Silver.
No. 1	$10.64	$3.14
No. 2	5.02	3.03
No. 3	15.55	9.28
No. 4	12.06	4.90
No. 5	4.13	6.77
No. 6	10.04	3 14
No. 7	5.02	3.93
No. 8	13.55	6.28
No. 9	8.79	6.28

You have here as an average, $9.42 in gold and $5.29 in silver. It will thus be seen that although a given amount of gold was saved in the first working, that no silver could have been (excepting that naturally alloyed with the gold) which is but a small per cent. It is certainly safe to say, that the average of all the "gold" ores of California is fully $5 per ton in silver, and every millman must judge for himself whether he had better run this off or seek to save it—to say nothing about the gold run off. What is further evidence of this waste, is the much larger quantity of silver per ton, to be found in the concentrations from our "gold" ores, and which, quite frequently, will run up to $30 and $40 per ton. No one concentrating sulphurets, should allow himself to be ignorant of the silver they contain, or to loose all they may have.

The following will exhibit in *per cent.* the gold and silver of our California ores, as per the deductions made by several of the most celebrated analytical chemists:

Gold. Per Cent.	Fineness.	Silver. Per Cent.	Fineness.	Copper. Per Cent.	Iron. Per Cent.	Silica. Per Cent.	Total.
75.86	758.6	20.67	206.7	0.29	54	2.44	99.73
80.57	805.7	12.33	123.3	0.29	54		100.00
86.87	868.7	12.33	123.3	.85			99.38
88.75	887.5	10.05	105.0			1.40	99.80
89.61	896.1	8.88	088.8				98.49
90.70	907.0	8.88	088.8				99.58
90.33	903.3	9.07	090.7				99.40
90.90	909.0	8.70	087.0		1.10		98.23
90.66	906.6	9.04	094.4		33		99.83
92.70	927.0	7.00	070.0	0.40	20		99.80
92.00	920.0	7.00	070.0		Trace.		100.00
93.53	935.3	6.47	064.7				100.00
96.42	964.2	3.50	035.8				100.00

Now all this must make it clear to our millmen, that they are running to waste too much of the precious metals. It is about time we quit this crushing system, of *crushing rock*, and give more care to saving the metals. Investigate as they do in silver mining, know what value your ore contains per ton *before reducing*, and I am sure the big difference between value and results will make millmen think and seek to save the difference.

THE *Independent* claims for the town of Sutro a population of 1,500. There are at present 600 men at work in the tunnel.

New Incorporations.

The following companies have filed certificates of Incorporation in the County Clerk's office at San Francisco:

HERMIT G. & S. M. Co.—Capital, $3,000,000. Directors—Herman E. Giffin, John Tonkin, F. M. Biber, Frederick Schumacker, Nathaniel T. Messer, John P. Bacon and T. C. Boyd.

UNION EXCHEQUER G. M. Co.—Object: To operate in Nevada. Capital, $5,000,000. Directors—T. W. Smart, John G. Green, Joseph S. Atwill, J. D. Brewer and Rudolph Schroeder.

LEOTA CON. M. Co.—Object: To operate in Inyo county. Capital, $20,000,000. Directors—J. M. Seawell, Candido Gutierrez, W. Ayer, J. H. Tingman, J. H. Johnson, T. R. Hayes and C. J. Wiley.

ROCHE ROCK M. Co.—Object: To operate in Nevada county. Capital, $500,000. Directors—Henry Odgers, W. H. George, Joseph Constance, John Skews and William George.

OVERTON M. Co.—Object: To operate in Bodie district. Capital, $1,000,000. Directors—A. C. Dunn, D. L. Smoot, E. D. Farnsworth, E. K. Wood and Robert Taylor.

NORTH STANDARD G. & S. M. Co.—Object: To operate in Bodie district. Capital, $10,000,000. Directors—J. McMechan, Bernard Lande, A. Burr, H. C. Van Dyck and W. L. Locke.

NORTH BULWER S. & M. Co.—Object: To operate in Bodie district. Capital, $10,000,000. Directors—J. McMechan, Bernard Lande, A. Burr, H. C. Van Dyck and W. L. Locke.

BULWER CON. G. & S. M. Co.—Object: To operate in Bodie district. Capital, $10,000,000. Directors—Daniel Cook, John F. Boyd, Seth Cook, W. Willis, Monroe Thomas, R. N. Graves and W. S. Wood.

FAIR VIEW M. Co.—Object: To operate in Mohave county, Arizona. Capital, $1,200,000. Directors—E. C. Bodley, Michael Wolfe, R. C. Swan, H. H. Collier, R. K. Whiteside, H. W. Wright, O. B. Kimball.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING APRIL 22D, 1879.

CARRIAGE.—A. Bink, S. F.
FIRE EXTINGUISHER.—W. F. Ferguson, Dixon, Cal.
HARROW.—Silas Harris, S. F.
LOOM.—R. H. H. Hunt, S. F.
SLOP HOPPER.—John G. Ils, S. F.
REGULATOR FOR ELECTRIC LIGHTS.—E. J. Molera and J. C. Cebrian, S. F.
REGULATOR FOR ELECTRIC LIGHTS.—E. J. Molera and J. C. Cebrian, S. F.
CARBON FLOATS FOR ELECTRIC LAMPS.—E. J. Molera and J. C. Cebrian, S. F.
VEHICLE RUNNING GEAR.—Chas. Oester, S. F.
ROCK DRILL.—H. Richman, S. F.
OXIDIZING, ETC., FURNACE.—W. T. Rickard, S. F.
TWISTING AND UNTWISTING FIBER.—A. T. Sherwood, S. F.
PORTABLE DERRICK.—J. Uriell, Collegeville, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

JUMP SEAT CARRIAGE.—Anthony Bink, S. F. Dated April 22d. These improvements are more particularly applicable to jnmp seat buggies, or those in which the seats are moved in such a manner as to form a double or single seated buggy or carriage. Great difficulty has hitherto been met in this class of carriages, because the springs which properly support one seat are not suitably proportioned to support two seats when they are opened out by any means employed; and the first part of this invention consists in a novel construction whereby the whole body is proportionately lengthened out as the seats are separated, and the seats themselves are placed so as to distribute the weight upon the springs. The inventiou also relates to a novel construction for a single and extension top, which is fitted to be used on either class of buggy, and in a means for usiug it with a single buggy or of packing away the rear portion. The device is very simplo and compact, and the chango from single to double, or *vice versa*, is made very quickly. The carriages are now being made by M. Kitzmuller, 850 Howard street.

FARM GATE.—E. L. Rugg, Capay, Yolo Co. Dated April 22d. This invention relates to that class of gates which are opened and closed by the driver or rider without the necessity of getting down from the wagon or horse, and the improvements consist in fitting between uprights a gate which may be slid up and down in grooves, the gate being balanced by weights. A peculiarly shaped hook or catch serves to bold the gate in an elevated position after it is raised by a cord hauging from the frame, and this hook is so constructed that the opposite cord when pulled upon will release said hook and allow the gate to descend. The ropes are so arranged that either will act as an opening or disengaging cord, according to the direction in which the team passes through.

METALLIC HARROW.—Silas Harris, S. F. Dated April 22d. The improvements consist in riveting on each side of the holes through the flat bars composing the harrow frame, a peculiarly formed right angled piece of spring steel, the two pieces forming a clamp for the harrow tooth. The upper edges of these clamps are nearer together than the lower, so that as they are driven apart by the insertion of the tooth, they grip the tootb firmly and hold it in place. The inner faces of the clamps are roughened so as to hold the tooth more firmly.

PORTABLE DERRICK.—J. Uriell, Collegeville, San Joaquin Co. Dated April 22d. This patent covers certain improvements in that class of field derricks such as are used in the field for threshing and stacking purposes, and it is expressly intended to render the derrick portable, to save time in setting and taking down, so that in moving from one point of operation to another the time required in setting the ordinary derrick is saved.

THE SOUTHERN PACIFIC.—The Yuma *Sentinel* believes, from certain indications, that the Southern Pacific Railroad Company will not cease their labors for the summer when the track is laid to Maricopa. It says though ties enough to complete the road to that point are already on hand, train loads of ties pass daily, and the same is true of the rails. Then a contract has been let to extend the road to New Mexico; and finally strong temptation to extend the road is offered by the facility with which the next hundred miles eastward can be constructed, and by the late extraordinary mining developments in southern and eastern Arizona.

SAN FRANCISCO has sent $5,000 in cash and provisions to Eureka, Nev.

News in Brief.

Texas suffers from floods.

THE President has vetoed the Army bill.

PORTIONS of Russia are suffering from floods.

DISASTROUS drouths have occured in Cuba.

THERE are five men in Bodie for every job.

TWO Leadville mines have just been sold for $270,000.

OREGON is troubled over the text-book question.

THE Russian army is to be increased by 150 battalions.

IMMIGRATION is rapidly flowing into southern Oregon.

THE Astoria (Oregon) canneries are busy putting up fish.

A HURRICANE has done great damage to the Friendly Islands.

JOSEPH COOK is to deliver a series of lectures in California.

THE political situation in British Columbia is reported alarming.

THE United States troops killed eight Sioux in a recent brush.

THE miners entombed at Sugar Notch, Pa., have been rescued.

THERE is a growing demand from Germany for coarse American paper.

EDISON claims to have fully solved the problem of electric light division.

THE British Pacific coast squadron has been ordered to cruise off Peru.

SIXTY Russian emigrants have arrived at New York en route for Dakota.

AT Vidalia, La., 3,000 negroes are on the river bank, awaiting transportation.

WITHIN the past four weeks 5,000 colored refugees have arrived at St. Louis.

AN attempt was lately made in Chicago to assassinate Edwin Booth the actor.

THE House has passed the Legislative, Executive and Judicial appropriation bill.

MANY wheat and barley fields near Healdsburg are showing symptoms of cheat.

THE Railroad company are planting encalyptus trees along the Humboldt valley.

SEVERAL Chinamen were recently poisoned near Monterey by eating toadstools.

THE high prices of provisions are causing disturbance in Malaga and Grenada, Spain.

IQUIQUE, Peru, is still bombarded and business in the interior is entirely disorganized.

THE Central Pacific contemplate moving their shops from Wadsworth to Reno, Nev.

THE steamer *Great Republic* was wrecked through an error of judgment by the pilot.

THE wreck of the *Great Republic* has been sold for $1,230, and the cargo for $2,500.

REPORTS from Ontario announce great sufferage among the Indians in the Northwest.

TURKEY has promised Servia to send troops to check the incursions of the Albanians.

THE revenue steamer *Rush* has been ordered on a five months' cruise in the waters of Alaska.

THE latest fashion absurdity is the "Boccachio" stockings—one leg white and one pink.

DURING February 14 vessels of a totol of 18,200 tons were launched on the Clyde, Scotland.

AN association has been organized in New York to assist worthy families to homes in the West.

THERE are 4,000 women postmasters in the United States, and the number is on the increase.

TRAINS leaving Ogden for the North are filled with prospectors and others bound for the Idaho mines.

DURING the past year the Fish Commissioners have distributed 140,000 fish in the waters of the coast.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Independence, April 28th, $6,000; Grand Prize, April 28th, $9,000; Ophir, April 24th, $19,677.14; Con. Virginia, April 26th, $20,543.26. California, April 26th, $41,920.86; Martin White, April 20th, $8,211; Alexander, April 26th; $6,731.62; Northern Belle, April 23d, $3,895.43.

AN ENGINEER, favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design stationary, marine, locomotive, mill work, sugar and hydraulic machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 416 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.
WEDNESDAY M., April 30, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, April 30, 3 P. M.

SILVER 1.30@1.

GOLD BARS, 890@910. SILVER BARS, 8@19 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾ Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 88@89.

LONDON Consols, 98 9-16; Bonds, 104.

QUICKSILVER in S. F., by the flask ~ lb. 40@41c.

Mining and Other Companies.

Persons interested in incorporated shires will do well to recommend the publication of the official noticee of their companies in this paper, as the cheapest appropriate medium for the same.

California and Oregon Land Company.—

Location of principal place of business, San Francisco, California. Location of Works, State of Oregon.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 2) levied on the first day of March, A. D., 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Allen, J O	130	400	$160 00
Pond, F B	129	50	20 00
Woodsum, O P	106	100	40 00
Woodsum, O P	107	100	40 00
Woodsum, O P	108	100	40 00
Woodsum, O P	100	100	40 00

And in accordance with law, and an order of the Board of Directors, made on the first day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Saturday, the tenth day of May, A. O., 1870, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

Cherokee Flat Blue Gravel Company.—

Location of principal place of business, San Francisco, California. Location of Works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Directors, held on the tenth day of April, A. D., 1879, an assessment (No. 41), of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the company.

Any stock upon which this assessment shall remain unpaid on the twelfth day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the tenth day of June, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco, Cal.

Rocky Point Mining Company.—Location

of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Summit Mining Company.—Location of

Principal place of business, San Francisco, California. Location of works, Mineral Point Mining District, Plumas County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 7,) levied on the 4th day of February, A. D., 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Byers, W T	38	700	35 00
Edwards, J E	30	700	35 00
Gautier, Gustave	156	200	10 00
Kellogg, H W	46	1000	50 00
Lehmann, C, Trustee	206	200	10 00
Lehmann, C, Trustee	207	200	10 00
Turner, J W	65	200	10 00
Thompson, R	24	1200	60 00

And in accordance with law, and an order of the Board of Directors, made on the Fourth day of February, A. D., 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, No. 318 Pine street, Room 6, San Francisco, California, on Tuesday, the Eighth day of April, A. D., 1879, at the hour of three o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Sec'y.

Office, Room 6, No. 318 Pine Street, San Francisco, Cal.

POSTPONEMENT.—The sale of delinquent stock of the above named Company is hereby postponed until Tuesday, the Sixth day of May, 1879, at the same hour and place. By order of the Board of Directors.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco.

JEWELLER.—E. E. Stacy, Reading, repairs all kinde of watches and jewelry. Refers by permission to the publishers of this paper.

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Treatment by a Purely Scientific and Rational Method Without Drugs of any Kind.

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Swedish Movements, The Health Lift, Spirometer or Lung Strengthener, Steam Atomizers, all Electric, Galvanic and Surgical Appliances, Sun Baths and Solar Ray Surgery, new and perfect Truss for the Radical Cure of Hernia, lately discovered Chemical Compound for the speedy, safe, painless and permanent removal of Cancers, Scientific and successful method for the Cure of Piles, etc., etc.

☞Aime to keep Abreast with, if not in advance of the Progressive Age.☜

It has been the mission of this System to mold public sentiment, and this Institution will hope to be no disgrace to the immortal name it has assumed. The time has come when Physicians of this School can afford financially to keep a conscience; in fact it is disastrous financially as well as morally to compromise the truth one jota; hence patients can rest assured that they will be treated by the Physicians after the most approved and scientific methods, out of pure and enlightened selfishness, recognizing the truth and beauty of this great principle:

"The Universe is so ordered and arranged that the real and permanent good of every creature is best subserved in promoting the real and permanent good of every other being."

THE BOARDING DEPARTMENT.

The table will be supplied with the best the excelsior market of the world affords, embracing fruits, grains, vegetables, meats, fish, fowl, eggs, cream, etc. Regular and transient boarders will be accommodated as well as patients. Business and professional men and women who are tired of restaurant fare, may appreciate eating to live a more healthful and enjoyable life. Pure food means pure blood. Pure blood means good health.

"The vegetarian school has demonstrated beyond the possibility of a doubt that farinaceous dishes, sweet milk and fruit, are sufficient to maintain a *hard working* man in perfect health. Such a diet might certainly be substituted by sedentary people for their greasy steaks and ragouts.—*Popular Science Monthly, December, 1878.*

The Roome are pleasant, warm, well ventilated and sunny; convenient to treatment rooms, so as to afford the best advantage of nursing and professional attendance.

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Fevers, and in fact all cases may be treated at home successfully. Paturition confinement cases are taken in the Institution or attended at home in any part of the city or country. Preparatory treatment in these cases is most important.

Testimonials of extraordinary cases and cures can be seen on application. The most desperate cases, and especially those that have been given up as incurable by the old methods, are invited. Puerperal and typhoid fever and diphtheria cases, after all other methods have failed, may be said to be a specialty. ☞Send for the TRALL HEALTH JOURNAL.

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Trall Hygienic Sanitarium, 8 Ellis St., S. F.

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LEA AND PERRINS' SAUCE,

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Lea & Perrins

which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London &c., &c.; and by Grocers and Oilmen throughout the World.

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Mining and Scientific Press Patent Agency.

PATENTS obtained promptly; Caveats filed expeditiously Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons, and our success and business are constantly increasing.

The ablest and most experienced inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

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Full geological description of this famous Quicksilver Mine, illustrated by maps and plans of the works. Complete description of the Quicksilver Furnaces and Condensers, etc. 48 pages octavo—paper cover—price (postpaid) 50 Cts. Published and sold by DEWEY & CO., 202 Sansome Street, S. F.

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Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire
Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,
For the Transportation of Ores, Etc.

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Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.

No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

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BRASS and BELL FOUNDRY

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BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
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DOCK HYDRANTS,
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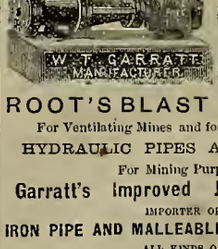

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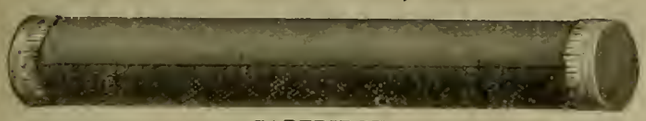
San Francisco, Cal.



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Under a series of U. S. Patents, after long and carefully conducted experiments and thousands of tests, this Company is prepared to manufacture and supply, for Mining and Engineering Works, the above named articles at prices and on terms as favorable as articles of similar grades are now supplied in this market. Our Powders contain no Nitro-glycerine, no Nitroline, no Gun Cotton, no Fulminates, and are free from the unavoidable dangers in manufacturing transporting, handling and using of all high grade explosives which contain those elements.

Cold does not affect them. They cause no headaches or other inconveniences in handling, and the smoke from their explosion contains no poisoning or sickening vapors.

Their blasting force, with slight tamping, at least equals that of any Powders now used, but they admit and require strong tamping to bring out their immense and peculiar lifting power which follows their detonating work. They should be fired, therefore, by our

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Which allows tamping without danger. They can be fired by any caps now employed in blasting, but the use of these is always dangerous with any Powder, and the loss of the throwing power resulting from lack of tamping renders it with our Powders doubly objectionable.

Our SAFETY CAPS have twice or thrice the force of triple Giant Caps. When set on fire they do not explode, but merely burn off, and are perfectly safe in transporting and in tamping. In round tin boxes, 50 cents.

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Cheap, handy and sure to light the Fuse upon the end of which it is fastened, only needs a trial to be appreciated by every miner who is up to "snuffs." 25 Cents per box; sent by mail.

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Equal to the best in the market, will be supplied at the lowest market prices.

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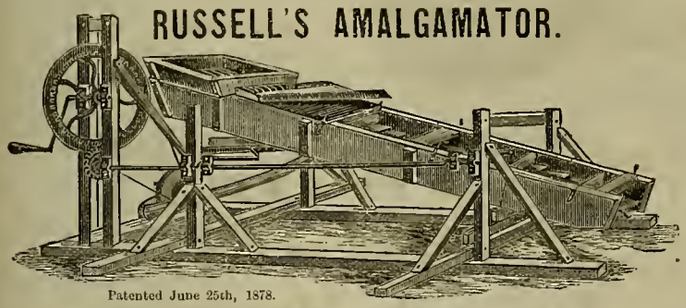

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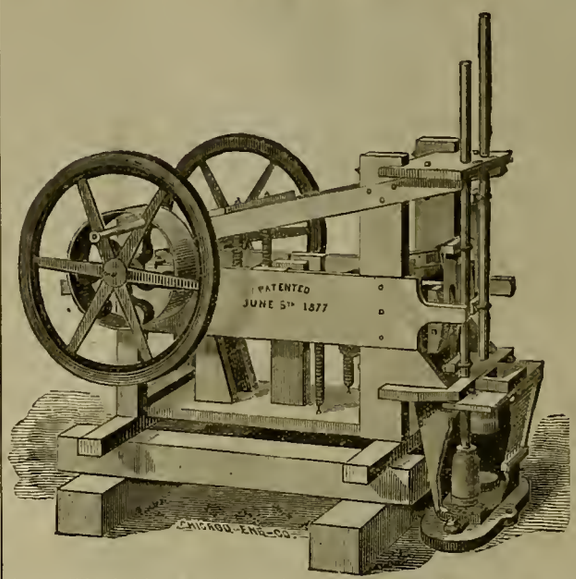
HAND OR POWER QUARTZ STAMP MILL.



Two men can operate it all day. It is simple, efficient and durable. The force of the blow can be changed so as to strike a light or a very heavy blow readily. Two men can work this Mill to its full capacity, and do the work as well as can be done with any of the old-style heavy Stamp Mills. An inspection of this Machine will convince any practical person that it is the most perfect QUARTZ STAMP MILL ever produced in this or any other country. A large number of old practical Miners have seen it, and they all say it is a perfect Hand Stamp Mill. We put on a band pulley, so it can be run with power. The cut is a correct representation of C. EATON'S Patent LATELY PERFECTED MILL.

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PROSPECTING

IT IS SIMPLY

Perfection!

When power is used, each Stamp will strike 150 blows per minute. The force of the blow in comparison to the face of the stamp (4½ inches) is greater than that of any of the heavy power Stamps. Stamps and Dies cast on chill. These Machines are well and thoroughly made, nothing about them to get out of order. They are put together with bolts. Can be taken apart readily, so as to be convenient to pack on a mule's back. The whole machine weighs about 1,300 pounds. The heaviest piece weighs 200 lbs. These Mills will do more work (according to money invested) than any of the old heavy Stamp Mills. Net Cash Price, $150.

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This engraving shows the Taylor Horse-Power usually sold to go with the Quartz Mill named above. This power is cheap, simple and effective. The size most suitable, taking the price into consideration, is the heavy one-horse power, cash price, $50. These Powers are sold by me to go with my Mill.

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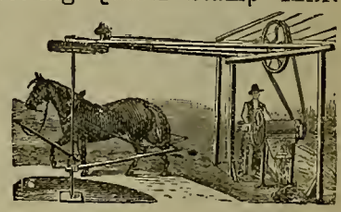

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It derives its name from HERCULES, the most famous hero of Greek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

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No. 1 (XX) is the Strongest Explosive Known.
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Apply to WILLIAM LETTS OLIVER,

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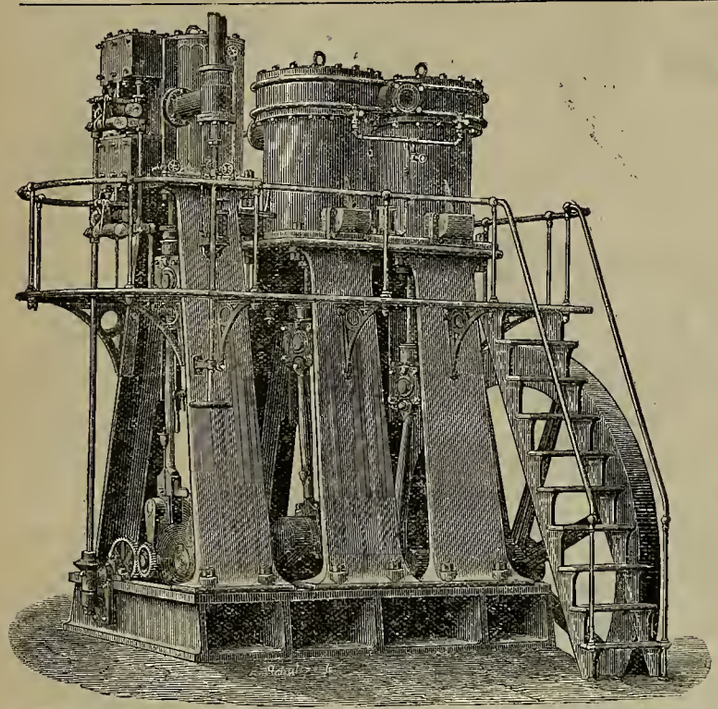

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AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

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The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast.

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

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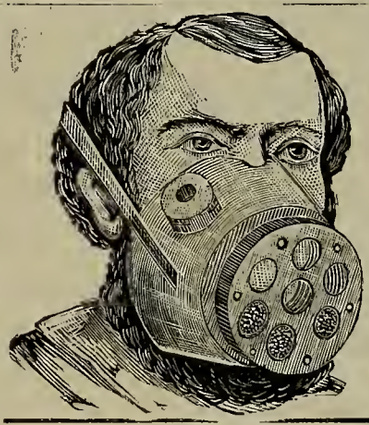

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Prevents Lead Poisoning and Salivation.

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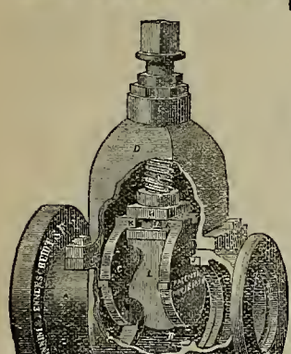

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The **G. & B. Valves** (or Gates) have no equal in simplicity of construction of all working parts, ease of access for repairs, and durability.

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Stronger, Better and Safer than any other High Explosive.

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IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 10, 1879.

VOLUME XXXVIII Number 19.

Terrace Canyons and Cliffs.

In Powell's "Exploration of the Colorado Rivor of the West," occurs tho following description of the Torrace canyons which are cut through three great inclined plateaus: "Conceive of three great geographic terraces, many hundred feet high, and many miles in width, forming a great etairway from the *Toom-pin Wunear Tu-weap*, below, to the the valley of the Uinta, ahove. The lower step of this stairway, the Orange cliffs, is more than 1,200 feet high, and the step itself is two or three score miles in width. The second step, the Book cliffs, is 2,000 or more feet high, and a score of miles in width. The third or upper step, is more than 2,000 feet high. Passing along this step, for two or three score miles, we reach the valley of the Uinta, hut this valley is not 5,000 or 6,000 feet higher than the *Toom-pin Wunear Tu-weap*, for the stairway is tipped hackward.

"Climh the Orange cliffs 1,200 feet high, aud go north to the foot of the Book cliffs, and you have gradually descended so that at the foot of the Book cliffs you are not more than 100 feet above the foot of the Orange cliffs. In like manner the foot of the Brown cliffs is but 200 feet higher than the foot of tho Book cliffs, and the valley of the Uinta is not quite 300 feet higher than the Brown cliffs.

"To go hy land from the valley of the White River to the *Toom-pin Wunear Tu-weap*, you must gradnally, almost imperceptibly climb as you pass to the south, for 40 or 50 miles, until you attain an altitude of 2,500 or 3,000 feet above the starting point. Then you descend from the first terrace, by an abrupt step, to a lower one. Still continuing to the south you gradually climb again, until you attain an altitude of more than 1,000 feet, when you arrive at the brink of another cliff, and descend abruptly to the top of the lowest terrace. Still extending your travele in the same direction, you climb gradually for a third time, until you reach the brink of the third line of cliffs, or the edge of the escarpment of the lower terrace, and here you descend by another sudden step to the plane of the river, the upper terrace through the Canyon of Desolation, the middle terrace through Gray canyon, and the third through Labyrinth canyon.

"The hird's-eye view, shown on this page, is intended to ehow these topographic features. The escarpment below, in the foreground, represents the Orange cliffs, at the foot of Labyrinth canyon; the second escarpment, the Book cliffs, at the foot of Gray canyon; the third, away in the distance, the Brown cliffs, at the foot of the Canyon of Desolation. It will be seen that the three tables incline to the north, and are abruptly terminated by cliffs on the south. For want of epace the whole view is shortened. In the three canyons there are three distinct series of heds, belonging to three distinct geological periods. In the Canyon of Desolation we have tertiary sandstones; in Gray canyon, cretaceous sandstones, shale and limestone; hetween the head of Labyrinth canyon and the foot of Gray canyon, rocks of cretsceous and jurassic age are found, but they are soft, and have not withstood the action of water so as to form a canyon. These formations differ not only in geological age, but also in structure and color."

Mr. Powell has a technical description of these terraces, with their geological peculiarities, somewhat in detail. Deductions are drawn from their formation also hy Prof. Le Conte in his recent work on Geology, published by Appleton & Co., of New York, in either of which works the reader who is interested may find further details.

PARTIES have left Portland, Oregon, for the head of navigation on the Columhia river to commence the preliminary survey for the construction of the Northern Pacific railroad from that point eastward.

THE publishers of the *Revolution Francais*, in Paris have been condemned to three months imprisonment and to pay a fine of 1,000 francs.

CHOLERA is causing great mortality in India.

No Cause for Alarm.

We alluded not long since to the fears entertained hy some of great disasters likely to attend the perihelion passage of the four great planets about to occur. These fears we attempted to show were not only groundless, but absurd, the failure of many similar predictions having been cited in support of this view of the matter. On the snhject of these threatened ills, C. C. Blake, a well-known Americen astronomer, puhlishes a long articlo in an Illinois paper, in which he demonstratcs the influence of theso planets upon our earth to be so infinitely small that we need apprehend no malefic effects therefrom. He even shows the very data upon which these alarming predictions are hased to he grossly and strangely inaccurate.

In the first place, astronomers, in computing the perihelion of Neptune, differ as much as seven years as to the time when that event will occur. In regard to the perihelion of Uranus, these authoritics are not agreed whether it will take place in 1881 or 1882. Saturn will not he in conjunction with the sun until the latter part of 1885, when the era of these dire calamities will he past and over. Jupiter, the largest planet in our system, heing 1,387 times as largc as the earth, will pass its perihelion point in September, 1880. These great orbs in this matter of coincidence will, in fact, not act at all conjointly. Even if they were to do so no great harm would follow. The perihelion of Jupiter, Saturn and Uranus all occurred in 1797, and yet that year was not distinguished for famine, tempests, plagues, or other great disaster. The perihelia of Jupiter and Saturn were again in coincidence in 1850, another year exempt from baleful influences and hloody eveuts. If all the planete in tho solar system were to pass their perihelion at one time and all in the ssme heliocentric longitude, such a conjunction would have no appreciable effect upon the climate or inhahitants of our glohe. Doubtless persons who have been giving way to feare about these planetary movements, may safely dismiss the same.

CO-OPERATIVE COLONY ASSOCIATION.—We notice that a movement has been set on foot in New York city in the organization of a Co-operativo Colony Aid Associatiou, to assist worthy families of workingmen to homes in tho West. An Executive Committee has been chosen, embracing the following: Charles F. Deems, R. Heber Newton, Felix Adler, Joseph Seligman, Courtlandt Palmer, E. V. Smalley, C. F. Wingate, Dr. Rylance, and George Saterlee. The plan is to put the advantages of colonization before the people, to aid such as are willing to go, if possible, and that eventually, if deemed advisahle, the Association should take the form of a joint stock concern.

BIRD'S-EYE VIEW OF TERRACE CANYONS.

TIME!—As the Manhattan mine at Austin, Nev., is now turning out bullion freely, is it not about time the shareholders should be receiving some dividends again? The Manhattan mill produced last week $17,819 from 98 tons of ore.

THE House Committee to inquire into the cause of the present depression of labor in California will leave for California July 15th.

DEPOSITS of tin ore are said to have been found lately along the foothills in Fresno county.

New Form of Stamp-Mill.

Charles S. Stanchfield, of Oakland, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency an ore mill of a new form. It consists in forming on a hollow shaft, journaled to one side of tho center of an evoluto or eccentrio case or mortar, a series of hollow guides, properly bushed and lined, in each of which plays loosely a stamp, which strikes a blow as the shaft is rotated. These guides being attached to the shaft at right angles aud the stamps playing loosely in them, the stamps are free to move out of the guides from either end and can strike two blows for each revolution of the shaft.

The mortar heing made of an evolute or eccentric form, after the stamps strike their hlow, they slide up the inclue or cnrve, grinding or pulverizing the ore as they move, nntil they reach suitable ribs which free the stamps from any rock that may have heen carried up in the outward movement. At this point gravity begins to act and the stamp falls the other way and crushes the ore, said operation being repeated. Water is fed to the mortar through the hollow shaft and guides, thereby lubricating the stamp stems and keeping them free from grit.

The dies are made of curved plates which are removahle. As many stamps may be placed in the shaft as practicahle, and they are eet so as to havo a regular interval between the drop. As the stamps slide freely on the guides, when the shaft is rotated at proper speed, said stamps slide or drop consecutively on the ore just as it reaches the dies under the feed opening. This crushes the ore and as the stamps are carried around by the rotation of the shaft, the shoes slide along the dies and further pulverize or grind the ore. The mortar or case being made in an eccentric or evolute form, and the shaft heing journaled at one side of the center, as each stamp slides along on the dies, it gradually curves further out of the guides, centrifugal force keeping it iu close contact with the ore on the dies. Before the time, however, that it reaches a horizontal position, the pressure gradually decreases and the shoe slides off the dies on to a rib. As the stamp slides on to this, any ore which may have accumulated on the shoe will fall hack on to the dies again.

The instant the stamp passes a horizontal position, gravitation will cause it to slide or drop in the other direction and ont of the other end of the guide, giving another blow upon the quartz on the dies. Each stamp therefore strikes two blows for each revolution of the stamp.

The water admitted to the hollow shaft ie ejected through the guides, around the stamp, going first out of one end of the guide and then out of the other, as each end is pointed downwards. This action not only furnishes water to the battery hut also serves to lubricate the stamp stem, and wash off any grit or sand from the stamp. The steel hushing inside the guide, and in which the stsmp slides, is made removable, so as to he changed when worn.

The rotation of the shaft is intended to be rapid enough to carry the stamps almost to a vertical line before they strike their blows, and each blow will therefore he struck at the point where ore drops on the dies. The grinding action of the stamp as it moves over the dies is the same as that of the drag of an arastra, which pulverizes the ore after the first crushing blow, much the same as that of an ordinary stamp.

The shaft is mounted on adjustable journals so as to regulate the amount of drop to the stamps. In case of dry crushing, a blast of air may be forced through the hollow shaft instead of water, and the grit kept out of the bushing by that means.

IT is now hy many believed that it is the intention of Jay Gould to extend the Utah & Northern railroad into Oregon, the objective point heing on the Columhia river, and thue making this road an important feeder of the Union Pacific.

DURING the late outhreak in Panama 35 persons were killed in the streets.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Letter from Tuolumne County.

A Slight Revival of Mining—Old Things Passing Away.

EDITORS PRESS:—After a long and what for a time eeemed a losing fight, quartz mining in Tuolnmne has been brought upon a self-eup porting and in some cases dividend-paying basis. That this etruggle should have been so prolonged and the issue for a time involved iu so much doubt has not been the fault of the mines nor yet wholly of the management. The main causes have laid back of these. From tbe first a large element of our population has consisted of those idle, shiftless sort of people, who will work only under the stimulus of big pay, sucb as cannot now easily be made, or the force of sheer necessity. Our pioneer miners were of a mongrel kind, made up in good part of Mexicans, Texane and Kanakas, with a large sprinkling of gamblers and other mcre adventurers, attrected at first to these diggings, where money being easily made was readily epent. So long as the rich surface placers lasted all went well. But eince they were worked out, or nearly so, things have undergone a change. To make money now requires economy and hard work. But we have many of these thriftless sort of persons with us still. They form a majority of our working population—or rather I should say of the people who ought to work, which they will not; unless, as before stated, they can get "'49" wages or are compelled by hunger. When hard up these make-shifts gouge out a little rich ore from their quartz lodes and pound it up in hand mortars, pan and crevice about in the eummer and practice eluice weshing and ground sluicing in the wiuter when they have cheap or free water, and in this way manage to keep soul and body together.

It has been their practice to take up mines and mining ground and, doing only work enough to hold them, hang on year after year unable to develop and unwilling to sell them at any reasonable price, thereby keeping out live men, discouraging investments and retarding the progress of the country generally. Even those of the earlier settlere who have undertaken to open and outfit their claims have, as a general rule, done so in such a halting, inefficieut sort of way as has failed to bring profit to themselves or help advance the mining intereets of the county. And so old Tuolumne has been, until quite recently, kept uuder a cloud; her mines worked without energy or system; her mills shut down, and the water, that should have been employed in gravel washing, suffered to run to waste.

Within the past year or two this condition of thinge has begun to change, the progress of qnartz mining especially having, for the last few months, been very marked. The old Soulsby mine, with its early brilliant history and subsequent mishaps, is coming to the front again in a way that promises to place it soon in the most forward rank of our productive properties, if it do not eclipse its early fame. The five-etamp mill lately put up on the Keltz mine bas eince heen running with such good results tbat the five additional etamps, for which power hes been provided, are at once to be put in place. On the Harris mine, near Jamestown, a new ten-etamp mill has been put up and is running to satisfaction, the old mill on this property having heen burnt down some yeare ago. The new ten-stamp mill on the Evans mine is also doing first-rate work. The mill on the Mount Jefferson lode, at Garrote, has also lately been started up, with the prospect of entering on a long career of success, as the mine of that company, after having been put in good shape under the new management, is showing up a eplendid body of rich ore. The improved outlook for the Mount Jeffersou has encouraged to a renewal of prospecting on other quartz ledges in that neighborhood; and, as a result, several rich finds are reported. Touching the value of the quartz veins about Garrote there has never heeu any question, but they bave mostly heen owned by parties of limited means, and have therefore never beeu thoroughly explored. This town will now take a new start, and shortly grow into an important quartz miuing center.

Several of our hydraulic mines are now being run with a full head of water, this branch of gold washing being more active than ever before. Some of the old tunnele run in this vicinity under Table mountain yeare ago and afterwards abandoned, are being reopened by parties who have both the will and meaus to thoroughly explore the auriferous channels that are known to run under these basaltic mesas. If they eucceed in getting into and draining these buried rivers, their reward ie certain. More gold will be taken out in Tuolumne thie year than last, and the bullion product of the county will hereafter eteadily increase.

OLD SETTLER.

THE Utah and Northern is to be extended anotber 100 miles by the Union Pacific this year, which will be a total distance of 280 milee, bringing it over the divide 70 miles from Snake river.

Volcanoes of the Pacific Coast.

The forthcoming "Journal for 1877," of the American Geographical Society, will be full of interest for the scientific public. Its first article, hy S. F. Emmons, of the Survey of the Fortieth Parellel, is a grapbic, but modestly told narrative of an achievement of which any mountaineer might be proud, and is full of novel information. Its title is the "Volcanoes of the Pacific Coast;" but the real etory ie of an ascent of Mount Rainier, whose magnificent, snow-covered peak dominates Vancouver, from an altitude of 14,144 feet. The writer of this paragraph has heard Mr. A. D. Wilson, the compauion of Mr. Emmons, in that perilous ascent, recount, by camp-firee in Wyoming, the toils and dangers of the expedition; and recognizes in this vividly-written history the fit presentment of a remarkable enterprise. This adventurous part of the essay we can only refer to.

In relation to tbe volcanoes of the west, Mr. Emmons considers that in the tertiary times the great interior basins, between the Rocky mountains and the Sierra Nevada, must frequently heve heen the scene of terrific volcanic action. In the upper basin of the Columbia and Snake rivers, tens of thousands of square miles were covered by continuous sheets of volcanic rocks, often many feet in thickness. As the massive eruptione of volcanic material gradually ceased, and the gaping fissures in the earth's eurface healed and were covered over, we may imagine along the western coast of that time a line of volcanic vents, like beacon fires, lighting up the rocky headlande, from which issued almost continuous clouds of steam and sulphurous gases, accompanied hy frequent ehowers of rocke and ashes and outflowe of hot lava, which gradually built up, around the orifices, immense mountain messes. At what time these eruptions ceased, we have no means of determining. In the cold, white glacier-scored peaks, the casual observer would scarcely suspect these ancient fiery mountains; yet, even uow, there slumbere within their mass a spark of the ancient fire, which may eome day break forth into conflagration. Through the crest of the Cascade range extends the American segment of that "Ring of Fire," which surrounds the Pacific ocean. The more prominent of the volcanic cones represented here are Lassen's Peak and Mt. Shasta, in northern California; Mt. Pitt, the Three Sisters, Mt. Jefferson and Mt. Hood, iu Oregon; and St. Helena, Adams, Rainier and Baker, in Washington Territory. Along the Sierra Nevada proper, which was lifted above the sea long before tertiary times, volcanic activity has hecn coufined to a few small volcanic vents along its eastern hase, near Mouo lake, and to flows of basaltic lava on its western slopes, which have, in many instances, covered the gold-bearing gravele of the late tertiary timee. In the midst of the lake is a small island, which conteins a crater and abounds in hot springs, while to the south of it extends a line of volcanic craters, forming a low ridge, relatively unimportant by the side ot the towering Sierres, but extremely remarkable as being the only place where the bleck glass, known as obsidian, so much prized by the Indians for making their arrow-heads, is known to occur in considerable quantity. Small fragments may be found in almost any portion of the Rocky mountain region, often hundreds of miles distent. The craters are generally eurrounded by a "cinder-cone," or a circular, rampart-like ridge of loose scoriæ and volcanic ash, within which are piled up irregular masses of black and gray glass and white frothy pumice, the latter so light as to float on water, and often drawn out in silky threads, like spun glass.

To tbe technical geologist, Lassen's Peak is, perhaps, the most interesting of all; it was iu its study that Von Richtofen gathered the moet important facts which led to his classification of tbe relative ages of volcanic rocke. Here are found places of long-continued volcanic activity, remnants of ancicnt cratere formed and destroyed eges ago. To the original andesitic eruptione have succeeded those of trachyte and rhyolite; the latter in the remarkable granitic form known as nevadite, tbe masses of which, in cooling, have shrunk and split up in the most remarkahle manner, resulting in a confused region of riven rock-masses, to which the appropriate name of chaos has been given. The final flowe have heeu of basalt, which rock has covered such immense extents of country to the north and east. Indications of the internal heat etill remaining, at no great depth beneath the surface, are found in its solfataras and hot springs, from which there is a constant escape of sulphurous gases and steam; these are concentrated in the basin of an old crater, christened in the characteristic Californian vernacular, Bummer's Hell. Here, also are found the eo-called "mud volcanoes;" little conical mounds only a few feet in higbt, with a central orifice, from which from time to time are thrown out masees of eoft, wet mud; within them a conetant rumbling, like eubdued thunder, may be heard at all times; and, by plugging up the orifice, an artificial eruption may, after a short interval be produced, and the plug will be thrown out with great force.

Shasta is another old volcano, and northeast of it are immense tracts of country, covered by flowe of basaltic rock. Broad etretchee of table-topped ridges are cut through in every direction by an intricate network of uarrow gorgee and ravines, abounding in natural fortreeses and cavee, and traversed by streams, which frequently disappear for distances of many milee beneath tbe horizontal beds of basalt, to reappear in a most unexpected manner. It was in such "lava-bede," that during the late Modock war, a mere handful of Indiane were able by their intimate knowledge of the intricacies of the region, to hold at hay the whole military force that could be brought against them.

East of Mt. Pitt are numerous lakes, which are probably fed largely from springs iseuing from tbe volcanic rocks. Most interesting among these is Crater lake, which fills an ancient crater about eight miles in diameter. Its walls rise from 500 to 1,500 feet above the level of the lake, and it is difficult to reach the shores without the aid of ropes. The showers of eshes which once issued from this crater can easily he traced by the peculiar character of the soil, for a distauce of about 28 miles east and 10 west of the lake.

In the region of the Columbia river, which presents eome of the grandest and most picturesque scenery of the United States, the volcanic phenomena, both of massive eruptions and of crater cones, attain an enormous development, and can be seen under most favorable circumstances. This river, which dreins an area of nearly 200,000 square miles, has cut its channel, in a cauyon-like gorge, transversely through the Cascade mountains almost down to the level of the sea. By means of the section thus exposed, we are enabled to study the etructure of this mountain range to its very core.

At the Cascades, nearly in the middle of the range, which form the limit of navigation from the ocean, and to which point the work of the Coast Survey has been carried so as to furnish trustworthy meesurements, the basaltic cliffs rise 3,700 feet, nearly perpendicularly, ahove the river. A thickness then of over 3,000 feet of lava has been accumulated from massive eruptions to form the range at this point. At the base of the cliffs is found a conglomerate or pudding-stone—a rock made of rounded pebbles and gravel, which time and pressure have compacted and hardened, and which here indicates a former shore-line that hes been covered by the basalt. Within the couglomerate are found trunks of trees, some changed to stone, some merely carbonized, with leaf remains, which enable us to determine the geological age of the period immediately preceding the building up of the range at this point. This was the miocene tertiary, a time when a tropical climate prevailed over our whole continent, even far up into the Arctic regions.

This bed of conglomerate also gives a clue to the history of a more recent period, to a change in the course of the river and the formation of the Cascades themselves. The Cascades are rather rapids than falls, where the river descends rapidly for a mile or two, in one place foaming and boiling over masses of broken rock. A railroad, six miles in length, conveys passengers from the steamer which comes from Portland to that which runs to the Dalles from the head of the Cascades. Just beyond this railroad may still be distinguished in the forests which cover the bottom of the canyon—here considerably wider than the bed of the river—the traces of an ancient stream-bed, somewhat higher than the present one, but which, at no very distant period, was evidently occupied by the river, being more in its direct course thau the bed it now occupies at the Cascades. Indians tell ue that there was once a natural bridge at the Cascades, by which their ancestors used to crose the river, and this is rendered probable by the existence of flat, table-like masses of basalt on either side, which might have formed the piers to such a bridge. Again, along the ehores of the river above the Cascades, are great numbers of dead tree-trunks, standing in the water and partially submerged even at its lowest stages. Pine trees would not have grown to such size in the water, or even if they had, what should have killed them all eo uniformly? . The explanation seems simple enough when all these facts are combined. At the time when, in the course of cutting this canyon through the mountains, the river had reached nearly ite present level, but was still running in the old stream-bed, its waters found a new outlet by perforating this permeable etratum of conglomerate. The opening thus made grew rapidly larger, owing to the easy disintegration of the conglomerate, until it was large enough to take the whole stream; and thie hed being at a depth much lower than the present, the old stream-bed was abandoned, and along the upper side of the river the trees grew down to its very edge, while the river, for a short distance, had the character of the lost rivers, being concealed beneath the basalt bridge; but in course of time the supports of the bridge were undermined and the whole mass of overhanging basalt fell iuto the etream, damming it up so as to produce the present Cascades, and causing a rise or "backing-up" of the water in the upper part of the stream, so that the trees along the edge, having the soil washed away from their roots by the rieing water, gradually died and decayed, leaving only the etumps we now eee liuing the bordere of the river.

In addition to Mr. Emmone' paper, the volume containe a description of the diamond fields of South Africa, by Wm. J. Morton, M. D.; a discussion of the King of Belgium's plan for the civilization of Central Africa, by means of lines of etations; an exceedingly valuable paper by the Rev. Dr. Selah Merrill, upon his late scientific researches into the archæology of Palestine; long papere upon a journey up the Magdalena river, and across the Andes, describing the discovery of the prehistoric etatue of "Chac-Mool," in Yucatan. There are eeveral minor contributions, and the whole volume richly repays perusal.—*Science News.*

Mining in New Mexico.

A Santa Fe correspondent of the Kansas City *News* thus writes concerning the mines in that Territory:

All the talk in Santa Fe, at present, is the new (in one sense, but old in auother), carbonate discoveries recently made 20 miles below this city by practical miners. Not only there, but all over the Territory, and in some portions of Colorado, the wonderful discoveries are known, and practical miners are coming into the various camps daily. Prior to their expulsion by the Indians in 1680, the Spaniarde, in a primitive way, worked these mines. Practical miners say that they have prospected sufficiently to know that the mineral belt extends at least six miles north and south, and five miles east and west, and that the true fissures point northeast and southwest. Dozens of new veins have been opened very cheap, and one and all show excellent mineral—thus far not a barren vein has been found. All the veins widen in depth.

The followiug is a brief statement of the condition of several of the first discovered mines: Mina del Tiro, width, 15 inches; depth, 160 feet; width at base, 7 feet. Carbonate, asseyed at 4 feet, 92:4-10 ounces; 8 feet, 120 ounces, width, 11 inches; No. 1, 63% lead; 21 ounces silver; No. 2, 51% lead, 34 ounces silver; No. 10, 50% lead, 8 ounces silver; No. 11, 44 ouncee eilver; No. 12, 72 ounces eilver; No. 13, 50% lead, 33.7 silver; No. 14, 135 onnces silver, 1⅞ ounces gold; No. 15, 50% lead, 10 ounces silver. This may not be properly considered a high grade of ore, but many miners of great experience coutend that it will pay a big per cent. for working. The average wealth of the ore is far from being fully developed. Not a shaft has been eunk over 20 feet, but they are going deeper rapidly. Withiu four miles, plenty of water for all mining purposes is to be fouud in large quantities. Reduction works will soon find their way into the camps, and no ore will have to be hauled over four miles. Alreedy very excellent roads are to be found leading to and from the various shafts. At no great distance southward, very excellent anthracite coal has been discovered in great quantities, also the best of fire clay, fuel of all kinds, it ie claimed, is remarkably cheap. Men who have delved in other mines for years are in these mines and well pleased, and say their friends are on the road by dozens; there is no braggadocio about them; evidently they mean business.

A few hours' walk through the carbonate country reveals the fact that the claims are being taken up rapidly; each stake shows a recent date, and the marks of the pick and shovel could be seen on every hand. The leads are well defined, and a boy, with but little explaining, could locate a claim just about as easy as an experienced miner, provided he did not infringe on the rights of another. There are at least 200 meu located in the different portions of this mining camp that have come to stay.

ELECTRIC LIGHT IN HYDRAULIC MINING.—The first electric light ever introduced in a mining claim was placed on the Deer Creek placer claim of the Excelsior Water Company at Smartsville, on the 10th of last month. A 12,000 candle power Brush machine was put in operation, and three lights of 3,000 candle power each were placed in prominent positions upon the claim. Although the night was very dark the lights shed a brilliant light around end enabled the miners to work as readily as during the day. Until this experiment the mines had to shut down during the night, but now the company expects to work hoth night and dey. Nevada and Yuba counties have many hydraulic mining companies, and several of them have announced their desire to use the new light if the Excelsior company is thoroughly satisfied with their machine. As Mr. Law has received several telegrams from the company which state that it is working well, there can be no doubt that it will be adopted. The three lights cost the company abont 10 cts. per hour, and with interest, wear and tear, etc., included, the claim ie lighted for 16 cts. per hour. The company's daily clean-up ie from $500 to $1,000, and by running uights also, the yield of the mine can be doubled.—*Nevada Transcript.*

THE RICHMOND FURNACE:—A good deal of flux is being taken out of the Belmont mine aud will shortly be shipped to the Richmond furnaces. The liberal terms offered by that company for low grade ores have been of great advantage to small mine owners generally—in fact to the owners of some of our larger mines as well. The shipmente of low-grade quartz kept the Connolly working eo long. Had it not been for them it would have been shut down long before. At the ordinary rates paid hy the furnace companies ore cannot be eold to any profit unless it coutaiu at least $75 per ton. By the arrrangements at the Richmond, siliceoue ores of $30 value can he handled to advantage, and even ore of from $15 to $20 will pay for its extraction; thus enahling mine owners of little means to coutinue in the development of their properties. The Richmond furnaces have at length attained their maximum emelting capacity of 80 tone daily. They are probably the largest lead emelting furnaces in the world, and the emelting as carried on in them a thing *sui generis.*—*Eureka Leader.*

MECHANICAL PROGRESS.

Suggestions for Safe and Economic Generation of Steam.

The report of Mr. Henry Hiller, the chief engineer of the National Boiler Insurance Company, Manchester, England, upon the technical work done during 1878, has just been issued, and contains a large amount of valuable information and useful suggestions. With regard to the advisability of compounding existing condensing engines, Mr. Hiller suggests that where these are overloaded, and the boilers in connection will permit of a suitable increase of pressure, great saving may be effected; but in many instances the better course would be to put down new engines and boilers suitable for the work required. The compound system is preferred on account of the avoidance of the great initial strain which is unavoidable with the single cylinder engine working with a high grade of expansion, as the load can be more uniformly distributed throughout the stroke; whilst with few exceptions the consumption of steam in compound engines is comparatively below that in the single cylinder engines. The proportions of cylinders in compound engines vary very considerably. Where it is desired to equalize the load, and the pressure in the boilers is (say) 80 pounds per square inch, a proportion of capacity of one to four has been found to give good results in engines fitted with ordinary slide valves worked by eccentrics. If the low-pressure cylinder is proportionately less the steam must be cut off at an earlier point in the high-pressure cylinder, but this will depend on the load to be driven, the pressure in the boilers, etc. Hence it is necessary that in all cases the proportions should be arranged to suit the respective circumstances and requirements.

Most careful calculation should be made where it is proposed to convert existing single engines into compound ones, as much disappointment has resulted by the adoption of cylinders of unsuitable proportions. In some cases after great outlay the results obtained were inferior to those secured before the alterations. Some parties advocate the use of a small high-pressure cylinder, the capacity of the low-pressure one being in the proportion (say) of eight to one, the steam being carried the whole length of the stroke in the high-pressure cylinder. This involves the low-pressure cylinder being of large size, and I believe considerably increases the comparative loss arising from the cooling effect of the condenser. The high-pressure cylinders have in many cases been made too large, so that the pressure of the steam was insufficiently reduced at the point of its final exhaust, and thus too much work was thrown on the condenser, involving a vitiated vacuum with consequent increase in the consumption of fuel.

The position of the cranks is a matter upon which much diversity of opinion exists. Where a pair of compound engines are coupled to the same crank shaft, it is apparently the most economical arrangement for the low-pressure engine to lead about 1-12th of a revolution, as the steam from the other cylinder then exhausts freely into the low-pressure one. If the character of the work necessitates the cranks being placed at right angles, a receiver of good capacity, and well protected against loss of heat, is of considerable benefit in reducing the variation of the back pressure in the high-pressure cylinder. If an engine be too small for the load to be driven, and its speed cannot be increased, expansive working cannot be adopted, and waste of steam ensues; whilst if, on the other hand, the engine be too large, there is great loss of steam through the friction of driving so large an engine, but often a still greater one through the large condensation of steam in the excessively large cylinder.

Experience has demonstrated the great economy and advantage of quick speed engines as compared with those running very slowly. The piston speed of many is so low that the steam admission has to be continued almost to the end of the stroke. Such engines thus work under conditions equally unfavorable to economy to those which exist in engines too small for their work. A quick piston speed is preferable; but if the engine be large in proportion to its work, rapid reciprocation may become a source of loss, if the load does not permit of a fair average pressure being maintained in the cylinder. He adds that the best results can be obtained with non-condensing engines, where the initial pressure on the piston is (say) about 60 pounds above the atmosphere, the engine being provided with expansion gear, and the speed of piston about 350 feet per minute—when the load is from three to three and a half times the nominal horse-power; this being taken on the basis of 10 square inches of piston for each nominal horse-power. If unprovided with a cut-off valve, the best load is from one and three-quarters to twice the nominal power, the steam pressure with such loads being reduced to about three and one-half to four pounds above the atmosphere at the point of exhaust. In ordinary condensing engines fitted with expansion gear or cut-off valves, and assuming 22 square inches of piston as equal to one nominal horse-power, the speed of piston being about 450 per minute, the best economical results can be obtained when the load is about five and a half times the nominal horse-power. If the engine has ordinary slide valves only, a load equal to about two and three-quarter times the nominal power would be fairly economical.

So much difference of opinion exists respecting the utility or otherwise of the "steam jacket" that its use is comparatively limited; but Mr. Hiller considers it is of great economical advantage when properly applied to condensing engines working with a high grade of expansion.

A Polysphenic Ship.

For the last six years, says the *English Mechanic*, the Rev. C. M. Ramus, Rector of East Guildeford and Playden, England, has held his invention of the polysphenic ship at the disposal of the Admiralty. This vessel, it is calculated, will skim the seas at the rate of 40 miles an hour or more. The word "skim" discloses the secret of the idea, for the invention is mainly based on the fact that if a vessel can be made by the mere force with which it moves to ride over the waves instead of driving through them, there is prima facie reason to believe that a much higher speed than anything yet reached will be achieved. The principle of Mr. Ramus' invention consists in making the bottom of the vessel a series of inclined plance. In 1872 Mr. Ramus made a model, having its bottom composed of two parallel and consecutive inclined planes; or the vessel may be described as made up of two wedges, the thick ends of which are placed abaft the thin ends. There is thus in the center of the vessel a ridge, where the thin end of the sternmost wedge abuts against the thick end of the foremost. Any floating body thus shaped must, when driven forcibly through the water, tend to rise, and if the speed is high enough it will rise on the surface instead of driving through the water. These facts were demonstrated by some rough experiments made in the presence of credible witnesses. The propelling power in these experiments was a six-ounce rocket. In one trial the model, weighing three pounds three ounces, ran a distance of 105 yards in three seconds. In another it ran 480 feet in 4½ seconds, the water being rippled by a strong breeze, but in spite of this the deck was found to be dry. The principle underlying these models, says the *Mechanic*, may be taken advantage of to construct wedge-shaped ships, for it has been demonstrated that resistance to such vessels, which at first increases about as the square of their velocity decreases as the speed is augmented, until after a certain period there is no further increase of resistance. Given the required machinery, then, for propelling the polysphenic ship and there seems every probability that speeds of 40 miles an hour and more can be attained.

Economic Production of Steam.

The *American Manufacturer* states that for 35 years persistent efforts have been made to run steam generators inside the fire-box or furnace of steam boilers. All, however, proved signal failures until Mr. Good hit upon the true principle of keeping up a steady and continuous supply of water from the boiler into the generator. No matter how intense the heat to which the latter is subjected the water cannot be driven from it into the boiler, but can only escape in the form of steam, which is rapidly generated and forced into the boiler. In the days of prosperous manufacturing few men paid much attention to their fuel bills, but the close margins to which all are now subjected through competition makes the consumption of fuel a matter of serious consideration. It has been practically demonstrated that this appliance—placed in the furnace, and connected with the boiler—will save from 30% to 40% in fuel. The time consumed every day in getting up steam will also be reduced about one-half. And what is equally important with the saving of fuel is that the working capacity of the boiler will be increased nearly one-half in power by the additional area of heating surface exposed to the flames in a position where the heat will be most effective, and by the rapidity with which the steam is generated. Hundreds of boilers, now unable to do the work required of them, may be retained by their owners if this device is used. There can be no question as to durability, for experience has shown that the circulation of water being maintained through the pipes they will not burn out any more readily than the flues of a boiler. It can be as easily attached to marine or locomotive as to tubular boilers. The low cost for which this apparatus can be furnished will, it is claimed, make its use universal, as it soon pays for itself.

American Wood Screws in England.—The New York correspondent of the London *Ironmonger* says that the American Screw Company, through its branch at Dundas, Ontario, is putting a brand of wood screws, known as the "Continental," into every important market in Europe, and that they are having some success even in Sheffield and Birmingham. There is said to be nothing on the wrapping of the packages to indicate that the screws are of American manufacture, which probably accounts for the fact that it has not been talked about in the English newspapers.

A combination of iron and steel is made extensively in France, according to the *Revue Industrielle*, by running the two metals separately into a mold, with a plate of thin sheet-iron at the dividing line. In this way, a perfect welding together of the two metals ensues.

SCIENTIFIC PROGRESS.

A New Form of Carbon.

In describing the Sawyer-Man electric light, last December, mention was made of the peculiar carbons employed, the manner of their production being a secret which Mr. Sawyer did not choose at that time to disclose.

We have now been favored with an exhibition of the process, and a very pretty experiment it makes. The carbons in question are about half an inch long, with the diameter of one-sixteenth of an inch. Their color is steel-gray, and the surface is hard as steel; within the carbon is tolerably soft.

In his earlier experiments Mr. Sawyer employed as the source of incandescence slender pencils of gas retort carbon in an atmosphere of illuminating gas. The carbons were slowly destroyed, but at the same time they took on a superficial deposit, evidently of carbon, but unlike in luster and hardness any carbon that Mr. Sawyer had seen. Inferring that a more rapid deposit would be made in a denser hydro-carbon, Mr. Sawyer experimented with a great variety of such liquids, finding olive oil most satisfactory. His method is simply to heat the carbon to an extremely high temperature, by passing through it an electric current, while it is immersed in the oil. The best results are obtained by the use of a pencil of willow charcoal, upon which an intensely hard deposit of carbon rapidly forms as the hydro-carbon is decomposed by the heated pencil.—*Scientific American.*

The Nature of Eozoon.—Dr. Dawson, in a reply to Mobius, which appears in the current issue of the *American Journal of Science and Arts*, takes exception to his arguments and reasons for pronouncing the *eozoon* to be of mineral origin, and reaffirms his belief that it represents the fossilized remains of an organic being. He (Dawson) asserts that Mobius has misinterpreted the characters of his specimens in several important particulars; as, for instance, in mistaking the veins of crysolite that traverse the serpentine and calcite for the walls of the *eozoon* chambers. Again, Dawson meets the objection of Mobius that the large (so-called) tubules are irregular and unsymmetrical, by urging that such irregularities can be satisfactorily accounted for as the effect of pressure and other physical incidents of fossilization; while the regular round and branchiug tubules which Mobius is disposed to regard as accidental, Dawson affirms to be in reality the normal structure of the organism. So far, therefore, from being settled, the question of the nature of *eozoon* is still a debatable one, with the weight of evidence probably slightly in favor of the view advocated by Dawson.

Tracing the Hudson under the Sea.—The *Atlantic Coast Pilot*, published by the United States Coast Survey, explains the origin of the curious deep holes met with along the New Jersey coast, some distance out at sea. Of these "mudholes," as they are termed, nine are known to navigators, the deepest and the furthest out being the 145 fathom hole, 83 miles southeast of Sandy Hook light vessel. These remarkable depressions, as the *Pilot* points out, bear the appearance of having been originally a continuation seaward of the Hudson River valley. They were in all probability scooped out by the river being forced to run through narrow gorges. Several of these gorges can still be traced running almost parallel with the New Jersey shore line. In fact, the soundings along the coast would seem to indicate that the whole coast line, ages ago, was many miles seaward of its position to-day; that then the Hudson river entered the ocean at least 100 miles southeast of its present mouth, and that the whole continent has since subsided, the sea encroaching further and further inland, as the country gradually sank.

Electro-Chemical Action under Pressure.—In a series of about 50 experiments, each of which continued for several hours, and during which pressures of 100, 200, 300, etc., atmospheres were maintained, A. Bouvet found the following laws: 1. The decomposition of water by a current is independent of its pressure. 2. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever may be the pressure. The laws are in perfect accordance with the mechanical theory of heat.

Improvements in the Telephone.—Prof. Righe's telephone, according to published accounts of its performance, must be by far the most remarkable apparatus for reproducing that has yet been devised. It it said to convey the sound of the human voice with marvelous distinctness. So much so that a large audience may distinctly hear a spoken address as delivered at the other end of the line.

Gallium Battery.—J. Reynauld has succeeded in making a battery of liquid and solid gallium by means of a metal solution of gallium sulphate. The liquid metal takes the place of zinc; the solid of copper; the former being negative in relation to the latter.—*Fortschr. der Zeit.*

Bleaching Diamonds.—Ch. Riballier recommends heating gray or brown diamonds with carbonate of lime and powdered coal in air-tight crucibles, and allowing them to cool slowly, in order to improve their color.

Brorsen's Comet.

This small periodical comet, which is now on a visit to our solar system, has recently passed its perihelion, and is now approaching the earth. It is a nebulous star, and moves so rapidly from one star to another that with even a very small telescope the observer can see the change in an hour's watching.

Its motion is from the constellation Camelopardalie to that of Ursa Major. Since April 21st the comet has been circumpolar and does not set in this latitude. Following the ephemeris of Schulse, the comet will be nearest the earth on May 10th—the date of this issue of the Press. Its place is now among the small stars in the head of the Great Bear.

This comet is now being made a matter of close study spectroscopically and otherwise. Prof. C. A. Young, of Princeton, writes to the New York *Times* saying that this comet has not an exceptional spectrum, as indicated by Huggins' observations of 1868, but falls into line with all the other comets. Prof. Young's observations were made upon the evenings of April 1st and 2d, and a comparison between the spectrum of the comet and that of the flame of a Bunsen burner showed a coincidence exact within the limits of observation.

Varying Velocity of Sound.—Some interesting experiments have been made at the U. S. Arsenal at Watertown, Mass., to determine whether the velocity of sonorous waves is or is not affected by variations in intensity and pitch. A 6-lb. brass field piece was placed in the midst of a large level field, and behind it, at distances ranging from 10 feet up to 110 feet, were placed a series of membranes electrically connected with a chronograph, which would thus give the instant at which the sound wave from the gun met each membrane in succession. The experiment was repeated many times and always with the same result. It was found that immediately in the rear of the cannon the velocity of sound was less than at a distance, but that going further and further from the cannon the velocity rose to a maximum considerably above the ordinary velocity, and then fell gradually to about the ordinary. When the gun, however, was pointed at right angles to its first position it was found that the position of maximum velocity was brought nearer to the cannon, and if the gun had been turned in the direction of the line of membranes, which was impracticable, it is thought the retardation which produced the first low velocities would probably have become an acceleration. The heaviest charges of powder caused the greatest deviations from the ordinary velocity. The experiments, accordingly, prove that the velocity of sound depends to some extent on its intensity, and that experiments on the velocity of sound in which a cannon is used contain an error, probably due to the bodily motion of the air near the cannon. Evidently a musical sound of low intensity must be used for a correct determination of the velocity of sound.—*Scientific American.*

Rise in the Waters of Great Salt Lake. Clarence King, in his late report of observations in the Great Salt Lake Basin says: "The well-known fact that the surface of Great Salt Lake is rising—it has risen 11 feet since 1867—has been generally ascribed to the cultivation of the surrounding region." Mr. King shows this to be a wrong inference, for a similar increase has affected all the lakes of the Great Basin. He shows partly from observations connected with the growth of trees on the Sierra, that this is due to a climatic oscillation that began about 1860, and which was the first of its kind and extent that has occurred within at least 250 years. This question of oscillation of climate is full of importance to the populations that are pouring into the regions of the great plains during the present moist extreme.

Changes of Spectra.—If a small quantity of mercury is placed in a hydrogen Geissler tube, E. Wiedeman finds that an induction current gives the hydrogen spectrum at ordinary temperature. But if the tube is warmed in air-bath, as the temperature rises the mercury lines appear, while the hydrogen lines grow fainter, and finally disappear. If a tube of hydrogen and nitrogen is warmed at any point, so as to free sodium or other metal from the glass, the hydrogen and nitrogen lines vanish almost entirely, while the lines of the metal appear. Does the hydrogen disappear, or is it transmuted into some other substance?—*Comptes Rendus.*

New Method of Producing Metallic Chromium.—M. Moissan has described before the French Academy, a simple method for producing metallic chromium. He agitates a concentrated solution of chloride of chromium with sodium amalgam, by which operation an amalgam of chromium is produced. This is boiled in water to remove the soda, and then distilled by heating in a current of hydrogen at about 150°. The chromium thus obtained is black, slightly coherent powder.

Retention of Heat.—M. Degremont glues upon cloth a series of small segments or rods of wood to form a sheathing for steam pipe. It has the advantage of being easily removed and replaced, which is not the case with most heat retainers. Small, round-headed nails are used to prevent contact between the wood and the pipe, and to inclose a layer of air between the pipe and the sheathing.—*Bull. de la Soc. d'Encour.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 17.		Week Ending Apr. 24.		Week Ending May. 1.		Week Ending May 8.	
Alpha	23¼	19½	19¼	18½	20	19	19	17
Alta	5⅝	4.90	5¼	4½	6¾	5⅝	6½	5
Andes	40c	35c	45c	35c	45c	35c	40c	25c
Alps	....	....	....	....	....	....	....	....
Argenta	1.65	1.20	1.80	1.60	1¾	1.40	1¾	1.20
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	15c	....	25c	15c	....	....
Baltimore Con	....	....	....	....	....	....	1	80c
Belcher	6	5⅝	5¾	5⅝	7	5¾	6½	4½
Belmont	30c	25c	10c	....	25c	20c	40c	....
Best & Belcher	17	15⅞	16	15½	16⅞	16¼	17	14¾
Bullion	5½	5	5¼	4.80	5⅞	5⅛	5¼	4½
Bechtel	1.60	1¼	1¼	90c	1⅛	95c	1.10	90c
Belle Isle	40c	35c	45c	....	40c	35c	35c	....
Bodie	9½	7⅝	9¾	8	9½	8⅞	9⅝	9¼
Benton	3½	3	3¾	2.20	4¾	4.15	4.35	3½
Bulwer	22	19½	22	20	22	18¼	12½	11¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.70	2.60	2.85	2.0	2.80	2	2.15	2
Belvidere	1.80	1¼	1.70	1.40	1.40	1.20	1.10	75c
Booker	70c	55c	55c	45c	55c	35c	50c	45c
Caledonia	2¼	1½	1.90	1¾	2	1.85	1.95	1¼
California	6	5¾	6¾	6½	7	6⅞	7¼	6⅛
Challenge	3.20	2.80	2.85	2.80	3.10	2¾	2¾	2¼
Chollar	6½	5⅝	6	5¼	6½	5⅝	6¼	6
Confidence	15	14	13¾	13	14¾	13½	15	11
Con Imperial	1.70	1.35	1.45	1.35	1⅛	1.40	1.40	1.20
Con Virginia	6	5½	6½	5⅝	6¾	6⅝	7⅝	6⅝
Crown Point	5¼	4¾	4.95	4¾	5⅝	4.90	5½	3.95
Con Washoe	....	....	....	....	....	....	....	....
Champion	35c	25c	25c	....	30c	10c	20c	10c
Concordia	....	....	20c	....	20c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	10c	...	....	10c	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	45c	30c	60c	45c	60c	40c	50c	40c
Eureka Con	17	16	15	14	16	14½	18	17½
Exchequer	5¾	5¼	5⅝	4.80	5½	5⅛	5½	4.95
Endowment	25c	....	25c	....	....	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3½	3	3.60	3.05	3½	3¼	3.45	3.30
Gila	35c	30c	35c	25c	35c	30c	10c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	9	....	9½	9	9	....	11½	10
Goodshaw	50c	40c	45c	40c	30c	....	25c	....
Gould & Curry	8¾	8¼	6½	6¼	9¼	6⅝	9¾	7⅝
Hale & Norcross	12¾	10⅛	11⅜	11	12½	11⅞	12⅝	10¼
Hillside	2.15	...	2	....	2¾	2.40	2½	2.15
Highbridge	50c	25c	35c	25c	35c	10c	30c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	20c	15c	20c	15c	15c	....
Independence	2¾	1.60	3¼	2½	3	2.90	2¾	2½
Julia	4.10	3½	3.90	3.55	4	3.60	3.90	3
Justice	4¼	3.60	3.90	3.60	4.15	3.70	3.80	3
Jackson	7¾	7¼	....	....	6½	6	6½	6⅛
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5	4¾	4¾	4½	4¾	4.6	4.60	4
Kossuth	20c	15c	10c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	80c	60c	95c	50c	95c	70c	70c	50c
Lady Wash	1	85c	1	....	1½	1.15	1.20	1
Leopard	1½	1.20	1.70	1½	1.60	1½	1½	1¼
Leviathan	50c	40c	60c	45c	65c	55c	75c	60c
Leeds	....	....	50c	....	75c	60c	75c	70c
Lee	....	....	....	....	....	....	...	....
May Belle	25c	....	25c	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.95	2¼	2.60	2½	2½	2.40	2.55	2½
Martin White	6½	6	....	....	6	5⅝	6	5¾
McClinton	1¼	1.10	1.05	90c	1	85c	1	90c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	32⅛	30	34	31¾	37½	34½	37¾	31
Mides	1	....	....	....	....	....	....	....
Morning Star	2	....	....	....	....	....	....	....
North Con Virginia	8¼	8	10	7⅝	11½	10	11⅝	9
New York	70c	60c	65c	55c	75c	65c	70c	55c
Northern Belle	9⅝	8	8¼	7¼	7	6½	7½	7
New Coso	....	....	....	....	....	....	....	....
Navajo	25c	....	....	....	20c	15c	20c	....
Occidental	....	....	....	....	....	....	....	....
Ophir	25½	22¼	27	25	37	27	36½	31½
Oriental	55c	30c	40c	....	50c	....	....	....
Overman	9¾	9⅛	9¾	8¼	10⅜	9¾	9¾	7
Panther	....	....	....	....	....	....	....	....
Phenix	3	....	....	....	....	....	....	....
Phil Sheridan	10c	5c	45c	4c	45c	40c	45c	40c
Potosi	4½	3.95	3.85	3.70	4	3¾	3.90	3.30
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5½	4¼	5	3.70	4	3½	3¼	3
Richer	80c	70c	90c	70c	70c	....	55c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11	9¾	10	9⅞	11	9⅞	11⅛	9⅝
Seg Belcher	....	....	....	....	2[illegible]	25	25	....
Sierra Nevada	43½	41¾	47	42¼	52½	47	52¼	42½
Silver Hill	1.30	1.05	1.30	1.15	1½	1¼	1.30	1⅛
Silver King	....	....	8	....	8½	8	8	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	65c	50c	50c	25c	35c	25c	40c	30c
Summit	2.40	2	2.30	2	2.10	2	2	1¾
Scorpion	1.60	1.40	2¾	1.60	2½	2.10	2.30	1.95
Solid Silver	35c	30c	30c	....	30c	25c	25c	20c
South Bodie	50c	40c	45c	40c	40c	35c	50c	35c
South Standard	25c	20c	20c	15c	20c	....	15c	....
Star	....	....	40c	....	50c	40c	50c	....
St. Louis	....	....	....	....	30c	....	....	....
Syndicate	....	....	2	....	2	....	2½	2
Tioga Con	2.30	1.95	1.80	1.70	2.70	2	2.30	1.90
Tiptop	75c	50c	75c	60c	75c	60c	80c	75c
Trojan	15c	10c	10c	....	10c	5c	5c	....
Union Con	59½	57	69½	58	75	69½	74¼	64½
Utah	15½	13¾	14⅝	13½	16¾	14½	16	13
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.15	1.05	1.15	1.05	1.15	1	1.15	85c
Wells-Fargo	10c	....	10c	5c	10c	5c	10c	5c
Woodville	....	....	15c	....	30c	20c	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16¼	14⅞	16	15	18	16⅝	16⅞	13½

Sales at S. F. Stock Exchange.

Friday A. M., May 2.
150 Alpha....19@18
220 Alta....6⅝@8½
200 Andes....35c
330 Benton....4@4.15
250 Bullion....5¼
500 Baltimore Con....1
430 Belcher....6⅜@6½
5 Best & Belcher....16⅝
610 California....6⅞@7
65 Confidence....15@14¾
3030 Con Imperial....1.40
865 Crown Point....5⅝@5½
330 Con Virginia....6¾@6⅝
105 Chollar....6
50 Caledonia....1.95
250 Exchequer....5¼@5⅜
350 Flowery....70c
440 Gould & Curry....9⅝@9¾
75 Hale & Nor....12¼@12½
310 Julia....3¾@3.90
100 Justice....3.80
100 Leviathan....65c
400 Lady Bryan....65@70c
430 Mackey....1.70@1.60
70 Mt View....7
175 Mexican....37¾@37½
755 N Bonanza....1.10@1.15
50 North Con Vir....11⅛@11
150 New York....70c
885 Ophir....38½@37½
200 Overman....9⅞
2[illegible]0 Potosi....3.30@3.90
100 Savage....10⅞
230 Silver Hill....1¼@1.30
45 Scorpion....2.30@2¼
300 Succor....30@35c
360 Sierra Nevada....51½@52¼
120 Utah....16@1[illegible]
260 Union Con....74@74½
1000 Wells-Fargo....5c
350 Ward....1.10
100 Woodville....25c
130 Yellow Jacket....16⅞

AFTERNOON SESSION.
200 Argenta....1¾
1200 Albion....40c
215 Bodie....9½@9⅝
595 Bechtel....1@1.10
1200 Belle Isle....35c
1130 Belvidere....1.10@1
40 Bulwer....12½@12¼
345 Black Hawk....2.10@2.15
250 Booker....45c
285 Caledonia (B H)....2¼@2.10
50 Champion....15c
1000 Crœsus....10c
200 C Pacific....2¼@2.30
175 Day....40c
260 Dudley....40@30c
65 Eureka Con....17½@18
15 Grand Prize....3½
400 Golden Terra....10@11
200 Goodshaw....25c
300 Highbridge....25c
100 Hussey....15c
250 Hillside....2½
40 Independence....2½
780 Jupiter....60c
20 Jackson....6½
170 Leopard....1½@1.35
20 Leeds....70c
20 Manhattan....2½
700 Martin White....5¾@6
300 McClinton....95c@1
190 Mono....3⅜@3.70
60 Navajo....20c
425 Noonday....2.30@2¼
100 Paradise....1½
30 Raymond & Ely....3¼
300 Red Cloud....65c
150 S Bulwer....65c
215 Silver King....8
100 Star....50c
135 Summit....2
600 S Bodie....40c
1650 Tuscarora....10@1[illegible]c
410 Tioga Con....1.95@1.90

Saturday A. M., May 3.
525 Argenta....1.65@1.60
225 Alta....6¼
50 Alpha....18¾
150 Andes....30c
200 Albion....40c
90 Best & Belcher....17
235 Belcher....6½
130 Bullion....5
1060 Benton....4¾@4.35
1045 Bodie....9¼
2660 Bechtel....1.05@90c
20 Bulwer....12
200 Belle Isle....35c
100 Black Hawk....2.10
240 Booker....45@50c
370 Belvidere....1
100 Champion....20c
165 California....6⅝@7
335 Con Virginia....6¾
100 Chollar....6¼
1265 Con Imperial....1.40
325 Crown Point....5¼@5⅜
140 Confidence....14⅛@14¼
375 Caledonia....1.80@1.85
290 Caledonia (B H)....2
190 Challenge....2¾@2.70
300 Con Dorado....65c
725 C Pacific....2.35@2.60
650 Day....4 @40c
410 Dudley....40@45c
240 Exchequer....5½@5
50 Eureka Con....17
500 Flowery....50@60c
245 Gould & Curry....9½@9⅝
60 Grand Prize....3.30
50 Golden Terra....13¼
180 H & Norcross....12¼
420 Hillside....2.45@2.40
300 Independence....2¼@2.55
310 Justice....3¾@3.60
230 Julia....3.85@3.80
300 Jupiter....55@50c
190 Kentuck....4.60
175 L Bryan....70@65c
150 Lady Wash....1.15@1.20
200 Leviathan....65@70c
400 Leopard....1.40
100 Leeds....75c
475 Mexican....37@36
260 Manhattan....2½@2.55
100 Mackey....1½
350 McClinton....95@90c
50 Mono....3.60
265 M White....6
50 New York....65c
220 N Con Virginia....11¼@11⅜
100 N Bonanza....1.15
350 Noonday....2½
200 Northern Belle....7
1810 Ophir....36@37
165 Overman....9¾@9⅜
55 Potosi....3¾@3.80
300 Paradise....1½@1.40
50 Real del Monte....3½
200 Richer....55c
60 Savage....10⅞@11
5 Seg Belcher....2.
375 Scorpion....2.20@2¼
150 Silver Hill....1
50 Succor....40c
475 Sierra Nevada....51¼@50
10 Standard....34
75 Summit....2
450 Syndicate....2
100 South Standard....15c
300 South Bodie....35@50c
200 S Bulwer....70c
135 Silver King....8
60 Tioga....2@1.90
600 Tuscarora....15@10c
100 Tiptop....50c
115 Utah....15
140 Union Con....74
70 Woodville....25c
50 Wells-Fargo....10c
790 Ward....1.15@1.05
340 Yellow Jacket....16½@16

Monday A. M., May 5.
290 Andes....40@35c
30 Alta....6@6½
50 Alpha....18½
75 Best & Belcher....16¾
200 Baltimore Con....80c
165 Bullion....5¼
715 Belcher....6@5⅝
440 Benton....4.35@4¼
320 Challenge....2¾@2.60
555 California....6⅞
930 Con Imperial....1.30
360 Crown Point....5¼@5½
1050 Con Virginia....6⅞@7
110 Chollar....6¼
1170 Confidence....14
390 Caledonia....1.65@1¾
255 C Dorado....85@90c
550 Exchequer....5½@4.95
100 Flowery....60c
370 Gould & Curry....9⅜@9½
290 Hale & Nor....12½@12¼
215 Julia....3.85@3.80
250 Justice....3.85@3.60
100 Kentuck....4½@4.60
360 Lady Bryan....50@55c
200 Lady Wash....1.10
400 Leviathan....75@70c
405 Mexican....36½@36¼
305 N Bonanza....1.20@1.3
650 New York....55c
100 North Con Vir....10¾
1350 Ophir....37¾@38½
100 Phil Sheridan....40c
1500 Potosi....3.80
365 Savage....11@11½
200 Sierra Nevada....50@49¼
50 Succor....35c
400 Silver Hill....1½
400 Scorpion....2.20@2.30
250 Trojan....5c
180 Utah....14½@13⅞
435 Union Con....74@74½
200 Woodville....25c
350 Ward....1.05
740 Yellow Jacket....15½@15

AFTERNOON SESSION.
970 Argenta....1.60@1½
200 Bodie....9½
140 Bulwer....12
350 Black Hawk....2
500 Belvidere....90c@1
320 Bechtel....1.05@1
400 C Pacific....3@2½
400 Caledonia (B H)....2¼
500 Golden Terra....12
155 Grand Prize....3.45@3.40
170 Hillside....2¼
530 Independence....2.60@2.65
250 Jackson....6⅛@6
350 M White....7
635 Mono....3.80@3.85
20 Manhattan....2½
185 Northern Belle....7½
750 Noonday....2.30@2½
100 Paradise....1½
410 Raymond & Ely....3¼@
150 Tioga Con....2.20

Tuesday A. M., May 6.
170 Alta....6@6½
85 Alpha....19
170 Andes....25c
405 Belcher....5¾@5⅝
90 Best & Belcher....16½
800 Baltimore Con....90c@1
4[illegible]5 Bullion....5@4.95
255 Benton....4.@4.05
390 Caledonia....1¾
8[illegible]0 California....7¼@7
2560 Con Virginia....7⅛@7
225 Challenge....2¼@2.30
150 Con Dorado....95c@1.05
75 Confidence....13¾
1085 Con Imperial....1.30@1.40
110 Crown Point....4.90@4.95
165 Chollar....6½@6¾
255 Exchequer....5@5¼
150 Flowery....65@70c
350 Gould & Curry....9
255 H & Norcross....12½@12⅜
455 Julia....3.80@[illegible]
165 Justice....3.70
50 L Bryan....55c
40 Leviathan....65@70c
380 Mexican....36½@36
100 Mackey....1.55
50 Mt View....8
435 N Bonanza....1.35@1.30
150 North Con Vir....11¼@11⅜
170 New York....60c
670 Ophir....37¼@37½
5 Overman....9
600 Phil Sheridan....40@45c
115 Potosi....3.80@3.65
110 Savage....11@10⅞
605 Silver Hill....1½@1.15
100 Succor....35c
60 Sierra Nevada....49@48½
225 Scorpion....2¼@2.30
50 Solid Silver....2 c
250 Trojan....5c
40 Utah....14½@14¼
125 Union Con....73½@72½
100 Woodville....25c
900 Wells-Fargo....5@10c
225 Ward....1.05@1
830 Yellow Jacket....15½@15⅜

AFTERNOON SESSION.
200 Albion....25c
500 Argenta....@1.30@1.20
100 Belmont....40c
610 Bodie....9⅜@9½
820 Bulwer....12@11¼
20 Belvidere....75c
100 Black Hawk....2
200 Booker....45c
485 C Pacific....2.90@2.85
50 Champion....10c
500 Day....45@50c
230 Dudley....35@4 c
80 Eureka Con....17½
1000 Fourth July....35c
20 Grand Prize....3.40
400 Gila....10c
200 Golden Terra....12½@12¼
100 Hussey....15c
700 Highbridge....30@25c
125 Hillside....2.15
200 Hamburg....40c
830 Independence....2⅜
100 Jackson....6½
200 Jupiter....50c
250 Leopard....1¼
200 McClinton....90c
650 Mono....3¾@3.80
150 Northern Belle....7
490 Noonday....2¼@2.20
200 Paradise....1½
225 Raymond & Ely....2.90@3
100 Red Cloud....50c
190 Summit....1¾
85 Silver King....8½
250 S Bodie....35@40c
100 Syndicate....2¼
550 S Bulwer....60@65c
360 Tioga....2.30@2¼
690 Tiptop....75@80c
100 University....40c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., May. 1.
100 Alta....6⅝
10 Alpha....19
85 Best & Belcher....16⅝
1295 Belcher....6½@6¾
230 Bullion....5¼@5½
100 Benton....4½
495 California....6⅞@7
1050 Con Virginia....6¾
650 Con Imperial....1.40
30 Confidence....14½
330 Crown Point....5⅝
220 Caledonia....1.90@1.65
270 Challenge....2¾@2.85
800 Exchequer....5⅝
1840 Flowery....65@80c
345 Gould & Curry....9½@9¼
270 Hale & Nor....11¾@11⅞
330 Justice....3.70@3¾
415 Julia....3½@3.70
100 Kentuck....4.70
530 L Bryan....70c
150 Lady Wash....1.15@1¼
250 Leviathan....60@65c
520 Mexican....34½@34¾
100 Mt View....6½@6¾
90 Mackey....2
370 New York....65@70c
50 N Con Vir....11⅛
750 N Bonanza....1.10@1.20
200 Ophir....33¾@34
35 Overman....9¾
270 Potosi....3.80
130 Savage....10½
25 Seg Belcher....25
600 Succor....30c
650 Sierra Nevada....48¾@49
185 Silver Hill....1¼
100 Scorpion....2.30
50 Trojan....5c
115 Utah....15½@15⅜
60 Union Con....71½@72
200 Woodville....20c
50 Wells-Fargo....5c
300 Ward....1.10@1.05
400 Yellow Jacket....16⅝@17

AFTERNOON SESSION.
100 Albion....35c
1100 Argenta....1¾@1.80
100 Belmont....20c
595 Booker....40@50c
400 Black Hawk....2.10
295 Bulwer....12½@12¾
600 Belvidere....1.15
1320 Bechtel....1@1.10
1115 Bodie....9½@9⅝
450 Champion....15@20c
235 Caledonia (B H)....2.20@2¼
200 C Pacific....2¼
300 Day....45@40c
410 Dudley....35@40c
165 Eureka Con....17@17¼
1750 Fourth July....35@40c
300 Grand Prize....3¼
700 Golden Terra....10@11
250 Goodshaw....30c
150 Hussey....15c
310 Hillside....2½@2.50
900 Highbridge....30c
150 Independence....2.80
250 Jupiter....50c
300 Leopard....1½
140 Manhattan....2½
15 M White....6
350 McClinton....95c@1
190 Mono....3½@3.60
540 Noonday....2.20@2.30
60 Northern Belle....6¾@7
6[illegible] Paradise....1½
210 Raymond & Ely....3¼
100 S Bulwer....65@70c
395 Summit....2
645 Silver King....8@8½
200 South Standard....15@20c
200 S Bodie....35c
1195 Tioga Con....2
1050 Tuscarora....10c
100 Tiptop....75c

Thursd'y A. M., May 8.
120 Alpha....17@17½
425 Alta....5@5¼
210 Best & Belcher....14½@14¾
745 Belcher....4½@4¼
305 Bullion....4½
290 Benton....3½
2380 California....7@7¼
1450 Con Imperial....1.20@1¼
595 Crown Point....3.9 @4
185 Confidence....11@11¼
200 Caledonia....1.40@1¾
250 Challenge....2¼
420 Exchequer....4.45@4½
70 Flowery....55c
615 Gould & Curry....7⅝@7¾
455 Hale & Nor....10¼@10⅜
255 Justice....3@3¼
315 Julia....3@3.40
35 Kentuck....4@4¼
185 Lady Bryan....50c
245 Lady Wash....1
160 Leviathan....65@60c
525 Mexican....31@31½
50 Mountain View....7
200 New York....60c
50 North Con Vir....9
485 N Bonanza....1.20
1550 Ophir....31½@33
165 Overman....7
215 Savage....9⅜@9¾
530 Sierra Nevada....42½@43
415 Silver Hill....1.30@1¼
375 Scorpion....1 9 @[illegible]
200 Solid Silver....25c
450 Trojan....5c
215 Utah....13
270 Union Con....64½@65
205 Ward....85@90
830 Yellow Jacket....13¾@13⅜

AFTERNOON SESSION.
800 Argenta....1.40@1½
500 Booker....45@40c
245 Belvidere....1@85c
185 Bulwer....11½@11¼
320 Bodie....9¼@9
405 Bechtel....1
100 Black Hawk....1¾
100 Belmont....40c
300 Champion....5c
575 C Pacific....2.60@2½
500 Dudley....30@25c
100 Day....40c
500 Endowment....15c
85 Eureka Con....17
500 Fourth July....35c
320 Golden Terra....14½@14
25 Giant & O A....5
200 Goodshaw....25c
300 Grand Prize....3.40@3½
50 Hamburg....40c
4[illegible]0 Hillside....2¼
100 Highbridge....35c
850 Independence....2⅜@2.90
30 Jackson....6
300 Jupiter....50c
980 Leopard....1½@1.40
100 Leeds....75c
200 Martin White....7
440 Mono....3.40@3.35
295 Navajo....20c
1115 Noonday....1.90@2
190 Northern Belle....7
25 Raymond & Ely....3½@2¾
100 Real del Monte....3
640 S Bodie....40@35c
45 Silver King....8
120 Syndicate....2¾@2.80
210 S Bulwer....60c
115 Tioga Con....2.30@2¼

California Board—Latest Sales.

Tuesday A. M., May 6.
40 Alpha....18¼@18⅜
100 Alta....6½@6¼
100 Argenta....1.60
150 Ætna....6c
270 Atlanta....1c
50 Belcher....5¾@5.90
200 Brilliant....20c
30 Best & Belcher....16⅞
90 Bullion....5@5.10
80 California....7½
90 Con Virginia....7¼@7.30
200 Con Imperial....1.30
90 Crown Point....4.95@4.90
70 Chollar....6@6.05
100 Challenge....2.80@2¾
125 Caledonia....1¾@1.80
90 Exchequer....4.95@4.90
80 Gould & Curry....9@9.10
450 Hartford....1.60@1½
30 Hale & Nor....12⅞
220 Julia....3.85@3.80
90 Justice....3½@3.60
50 L Bryan....60c
30 Mexican....36½@36⅝
100 N Sierra Nevada....5c
30 Ophir....37½@38
40 Savage....10⅞@10⅞
30 Sierra Nevada....49@48½
1000 S Utah....1c
100 Senator....30c
50 Silver Jacket....70c
250 Silver Hill....1.20@1¼
20 Union....74½@75
1000 U Flag....4c
150 Wells-Fargo....5c
150 Wm Penn....25c
30 Yellow Jacket....15¾@15⅝

AFTERNOON SESSION.
30 Alpha....19@19½
20 Alta....6½@6¼
100 Ætna....7c
3500 Atlanta....1c
100 Almaden Q....2c
40 Bullion....5@5½
10 Belcher....5⅞
20 Best & Belcher....15¾@15⅞
50 Crown Point....5@4.95
300 Coso Con....5@4c
70 California....7½
30 Chollar....6¼
80 Con Virginia....7½@7
80 Exchequer....5¼@5.30
100 Endowment....20c
200 Enterprise....1
50 Gould & Curry....9@9½
150 Goodshaw....30c
100 Glen Dale....35c
30 Hale & Nor....12⅝
80 Julia....3.80@3⅞
90 Justice....3⅝@3.70
30 Mexican....36@36½
110 Mono....3¾
500 N Sierra Nevada....5c
250 Noonday....1¾@1.80
40 Ophir....37⅝@37½
90 Potosi....3.85@3⅞
10 Savage....11
20 Sierra Nevada....46½@48¼
150 Trojan....6c
30 Tiger....1½
40 Union Con....73@72⅞
50 Wales....1@1¼
40 Yellow Jacket....15⅞@15½

Pacific Board—Latest Sales.

Tuesday A. M., May 6.
150 Alta....5¾@6
100 Belcher....5.80
50 Best & Belcher....16½
150 Con Virginia....7.05@7.10
15 California....7@7½
270 Con Imperial....1.35
50 Chollar....6¼
130 Exchequer....5¼
160 Gould & Curry....8.90
20 Hale & Nor....12⅜
10 Justice....3.55
130 Mexican....36½@36⅝
140 Ophir....37¼
20 Overman....8½@9
100 Potosi....3.60
440 Silver Hill....1.15@1.10
105 Savage....10⅞@10⅝
20 Sierra Nevada....48⅜
20 Utah....14½
50 Yellow Jacket....15½@15⅝

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Booker Con G M Co	California	2	25	Apr 23	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 15	H A Whiting	211 Sansome st
Modock Con M Co	California	8	50	Feb 13	——	May 15	J W Pew	310 Pine st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
N Con Virginia M Co	Nevada	16	1 00	Mar 21	Apr 24	May 13	G C Pratt	309 Montgomery st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Phil Sheridan G & S M Co	Nevada	9	40	Mar 24	Apr 25	May 13	D L Thomas	203 Bush st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	May 12	June 3	Jno Crockett	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Butte Creek H M Co	California	2	25	Apr 16	May 17	June 17	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Equitable T & M Co	Utah	20	10	Mar 21	Apr 23	May 14	Chas J Collins	227 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 26	O H Bogart	106 Leidesdorff st
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
McMillen S M Co	Arizona	2	25	Mar 19	Apr 23	May 15	J Morizio	328 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	50	Apr 19	May 26	June 12	H Aug Whiting	211 Sansome st
Sophia G M Co	California	1	02½	Apr 23	May 26	June 13	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Diana G & S M Co	Nevada	Jno T McGeoghehan	318 Pine st	Special	May 12
Golden Gate Con H M Co	California	J o T Geoghehan	318 Pine st	Special	May 23
Pioneer Con M Co	Nevada	J M Buffington	309 California st	Special	May 19
Hussey Con G & S M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 26
Selby Hill M Co	California	H Aug Whiting	211 Sansome st	Special	May 8

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Apr 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	Apr 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

Mining Share Market.

The fluctuations of the market during the past week give it much the appearance of a "chopped sea." It has been up and down alternately, weak one moment and strong the next, but nothing very long at any time. The prospect is problematical, though not very encouraging. There has certainly been a gain in activity. Business has increased steadily and the entire market has undergone a very perceptible hardening. This has been the general tendency. The outline, however, has been filled in with many violent, frequent, and for the most part, unexplainable, fluctuations. The stock exhibiting the most activity has been Ophir. Here, the movement may be accounted for by the late developments of ore in the incline below the 2300 level. Mexican, Union, Sierra Nevada and other north end stocks advanced through sympathy but not to a remarkable extent. Now that the new Constitution question is settled it is to be hoped that the market will become clearer and more decided one way or the other, for as it stands at present, it is simply distracting. There was a slight shading off both in prices and business towards the close of the week, but the condition of things was brighter and more encouraging than for the one preceding.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Christy, May 5th, $5,214; Paradise Valley, May 3d, $6,140; Alexander, May 3d, $9,958.27; Ophir, April 29th, $20,017.36; Independence, May 5th, $6,400; Hillside, May 4th, $5,220; Ophir, May 5th, $11,442.40; Con Virginia, May 5th, $21,094.63; California, May 5th, $52,353.07.

PAPER FRICTION PULLEYS.—A cheap form of friction pulley is now made by cutting pieces of pasteboard into disks of the size of the required pulley, pasting them heavily with hot glue and laying one over the other until the proper thickness is obtained. The hole for the shaft is cut in each piece before they are glued together, and when the wheel has been formed it may be pressed till the glue is cold. The face of the pulley may then be turned down smooth in a lathe and, to make a firm edge, iron rings or clamps may be fastened to the sides. Such paper pulleys are said to run with good usage for a long time.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

NOTES.—*Signal*, April 30: "The Monitor and Northwestern"—"Silver Glance"—"Advance"—"Boston" mining company have shut down for the present, preparatory to another start under a new name, but doubtless the old plan. They keep two or three men employed to take care of their property in the meantime. This acrobatic company have recently undergone another change of name, thereby turning a penny or two. The Colorado No. 2 company just completed a run of about 100 tons of ore in the Boston mill, and will probably know the result in a few days. They are putting concentrators in their own mill, and hope to be able to start up in about three weeks. There is faith in the merits of the mines in this district, but not in the honesty of the men who pretend to develop them. Messrs. Griffith, Curtz, Arnold *et. al.*, will give the stockholders in this company a square deal, notwithstanding that they received their mining education in so bad a school. A few months will suffice to decide both the value of the mine and the honesty and efficiency of its managers.

AMADOR.

NEW MINE.—*Ledger*, May 3: On the 17th of March last, the South Spring Hill company commenced operations on a claim a few rods from the Keystone. The shaft they are now sinking has reached a depth of 25 ft, or timbered that far. They propose to sink to a depth of 400 or 500 ft before they commence er sscutting. The location is on the Keystone belt. All the machinery is on the ground.

THE NORTH GOVER.—This company has emerged from its litigation tangle, and now has an unclouded title to its claim. The company propose to enter immediately upon active development of the mine.

MAHONEY.—The new shaft of the Mahoney mine, at Sutt Creek, is down about 30 ft. Powerful hoisting machinery has been purchased in New York to be erected over this shaft. The superintendent expects to prosecute sinking operations right along, and as soon as the proper depth has been reached, the development of the mine will be proceeded with.

MISCELLANEOUS.—A rich strike is reported in the Gover mine. The rock is looking better than for months past. The last crushing of Downs' rock, at Volcano, yielded an average of $32 per ton.

PLYMOUTH ITEMS.—The Hercules mine closed down on Friday of last week, until after election. The Centennial mine is also idle. The Phœnix mine and mill are in full blast. Two men have taken a contract to clean out the old shaft on Green & Adon's claim.

CALAVERAS.

MURPHY'S EYE.—*Citizen*, May 3: Smith & Co. have their new hurdy-gurdy wheel in, and their mill near Murphy's is in active operation. Chapman & Co. have purchased the mill on the Oariballi mine, at Dogtown, and are putting it up near Murphy's. It will be run mostly on custom work. Collier's mine is paying well, $2,000 being cleaned up in two weeks' run. The Union Water company have a large force of Chinemen employed enlarging the Dogtown ditch. Wallace & Co. are getting some fine rock from their mine situated on Indian creek.

EL DORADO.

BRILLIANT PROSPECTS.—Placerville *Democrat*, May 3: Reports of a most encouraging character come from the Esperanza mine, near Garden valley, which N. D. Burlingham is engaged in opening and developing. At a depth of 130 ft on the ledge, about 100 ft perpendicular, Mr. Burlingham has drifted about 13 ft, all the way in ore, and has not yet reached the hanging wall. For 14 ft of distance drifted every particle of quartz that has been tested has given a good prospect. It is, thus far, the finest mining development made in El Dorado county for many years.

RICH ROCK.—*Republican*, May 1: Some of tho richest quartz specimens seen for a long time were lately exhibited by Mr J. W. Johnson, who, with his father and brothers, have a mine on or near French creek, Mud Springs township. The specimens contained from $10 to $30 each, all containing considerably more gold than quartz. Most of the gold taken out is of this character, and many thousands of dollars have already been secured from the claim, all of which has been worked in a hand mortar.

MILL QUARTZ.—Cal. Duden, railroad agent at Latrobe, has a 10-it ledge at the depth of 100 ft, and enough drifting has been done to establish its permanency. Negotiations for its sale to a Boston company are now pending, at a handsome price. There is no doubt but that the sale will be speedily consummated, and that it will he the means of developing other rich mines in the vicinity. It ie the intention of the parties negotiating to put up a first-class mill and hoisting works at once, already having satisfied themselves of the character and permanency of this ledge.

INYO.

THE INDIANA.—*Independent*, April 20: Such is the name of the principal mine, so far as opened, of the newly discovered series above and about three miles from Swansea, belonging to Messrs Boley & Turtle. They are now extracting ore of astonishing richness, from a vein ronging from 15 to 18 inebes thick. Ten tone of ore are now on the dump, assaying from $800 to $2,000 per ton, which will be shipped to merket as soon as eacks can be obtained. The ore is covered with patches of a light pink colored horn silver. James Hanger has located another claim in thet vicinity, showing the eame class of rich ore, which is now being prospected. Considerable attention is being attracted to that region.

MINOCK.—Work at all points is going ahead well and continues favorable. Tunnel 1000 level was run 39 ft last week, making a total length to date, 1,481 ft. Shaft from 300 lovel was sunk 11 ft, and ie now down 386 ft. Distance made in upraise tor the week, 14 ft, giving present hight of raise 96 ft. The ground beyond the cave is soft limestone, breaks well, and the tunnel is making good progress. They are crowding work ahead as fast es possible in shaft and upraise to make connection for air. The length of tunnel makes it necessary, while stoping upraise, to utilize all tho air that can be forced in at the breast. The addition of small boiler gives much better air than heretofore had, but not in such quantity that they can dispense with any considerable portion of it for other purposes. General appearance of ground at points where work is being carried on is very favorable.

SNOW'S CANYON.—Snow's Canyon mill, under lease to Birchett & Parker, and under forcmanship of J. H. Grove, started up for a continuous run. The first lot of ore to be worked is some nine tone from the Virginia mine, belouging to Groves & Mitchell. A lot of 44 tons now out at the dump of the imperial, belonging to Ross & Smith, will be reduced, together with the amounts to be extracted by a force of six miners as the work progresses. The St Elmo mine, the property of Freeman & Logue, has taken out some 10 tons, while many other prospecting parties have on hand from 1 to 10 tone each. The ore is of high grade common to the Snow canyon mines, conteining gold and eilver. Prospecting has taken a material advance in the district, and in all probabilities the mill will not have occasion to shut down for some two or three months to come.

MARIPOSA.

PRINCETON.—*Gazette*, May 3: Mr. D. Gourguet, Superintendent of the Merced River tunnel, has struck it rich in that claim. The vein is large, measuring three ft, and the ore is unusually rich, assaying way up in the hundreds.

FERGUSON MINE.—This mine is situated on the meln Merced river, about five miles west of Hito's Cove, and is now in successful operation, running a 10-stamp mill by water-power. The proprietors are Mr. John Ferguson, Isaac Hall, Leachman and Sherwood, under the style of the Ferguson mining company. Mr. Robert Francis is the Superintendent, and Mr. Joseph Opie the blacksmith. The total number of men employed a out the mine and mill is 16. The shaft, which is about 212 ft, and the hoisting works are about 1,000 ft from the mouth of the main tunnel. The hoisting works consists of an undershot horse-whim of the latest improvement, capable of hoisting 1,000 pounds to the bucket. The mill crushes about 12 tons of quartz in 24 hours. This company obtain their supplies principally from Sonora, Tuolumne county. The rock is rich in free gold and the company is prospering.

MONO

THE OAO MINE.—*Standard*, May 2: This property is situated on the summit of Silver hill, north and east of the Noonday, and directly east of the Red Cloud. The shaft is down 100 ft. It is a double-compartment, four by four, and timbered from top to bottom in first-class a yle. At a depth of 200 ft, crosscuts will be run east and west for the three ledges belonging to the company. Thomas Steel is Superintendent.

ADDENDA.—The water is troubling a little in bottom of main shaft, now down a depth of 400 ft, and it is the intention to put in a Cameron pump, which is expected to arrive here soon by fast freight. The present boiler is of capacity to make steam for the extra engine, which will be set up at the 400 level, and the steam carried down in a two-inch pipe. Of course, if any great body of water should be encountered in the mine, it would put the pump to the test very soon. It is expected to prospect the claim to a depth of 100 ft at least below the level in qusation. The quartz in the bottom of the shaft is of better grade, and there is more of it.

GOODSHAW.—The east crosscut, 450 level, is in 200 ft, an advance of 17 ft. The west crosscut is in 125 ft, an advance of 14 ft. The formation in the east is of an excellent character of iron-stained porphyry, with occasional seams of quartz. The west crosscut is in hard, blasting rock.

THE ORIENT.—The east crosscut is in 165 ft, an advance of 17 ft during the week. A ledge was cut in this drift, samples from which assay from $40 to $100 per ton.

THE BODIE TUNNEL.—The tunnel is in 920 ft. The formation is a blue bird's-eye porphyry, very favorable to the working of a vein. The air continues excellent, owing to the fluo which is carried under the track floor.

STANDARD.—On the east crosscut, 300 level, toward the Summit, from the main drift south, a good ledge has just been cut at a point 200 ft east, prospecting well. It has been decided to put in this big pump right along, and stone for the engine foundation is being obtained near Huntoon's ranch. The engine will be placed inside of the main building. Where the air compressor was set up, foundation for two extra boilers was also prepared. It will probably require three months to complete this work. The crosscut on the 700 level east has developed a much softer and more favorable formation, es if a ledge were making of importance. The winze sinking on the Burgess ledge, near the connection of drifts between the Standard new shaft and the Bodie claim, has come upon rich ore again, while the Bruce works, on the Standard side, are as rich in free gold as ever, and the ore faces hold out in size over the drifts. One of the most singular, and possibly important features of this portion of the claim, is the appearance of horn silver in connection with the free gold; this is considered very suggestive of both great permanence and importance. The Gildea ledge, one of the most clean-cut and important in the district, never looked better than it does to-day, and in the Standard claim. One thousand tons of Standard ore will be crushed at the Syndicate mill.

NEVADA.

THE DRAIN PROJECT.—*Union*, May 4: The contract between the New York Hill and New Rocky Bar mining companies has been ratified by both, by which the drain tunnel from the first named mins shall be extended into the ground of the latter, by wh ch it will be drained to a perpendicular depth of 200 ft and thus relieve it of the surplus water which is troublesome in a wet season. Operations will be first commenced by putting up pumping machinery on the old Chavanne shaft (though the Rocky Bar was worked many years ago) and pump it out. When this is accomplished, the work of driving the tunnel will be commenced at both ends and prosecuted as fast as practicable. The distance to be run is ab ut 300 it. The waste rock will be hoisted out by the respective companies, the New York Hill having bargained to raise the rock from their end of the tunnel at a fixed price per carload. The Rocky Bar company is now calling for bids for retimbering the Chavanne shaft down to water level, preparatory to the putting in of a pump. The water is now standing in the incline to the depth of about 250 ft.

SCADDEN FLAT.—Superintendent Richard Roberts hae magnificent specimens of gold-bearing quartz just taken out by tributers in the Scadden Flat mine. They were taken from new ground on the first level, where the ledge is strong and firm and pitching downward in ground that has never been worked.

MISCELLANEOUS.—*Foothill Tidings*, May 3: Work on the new air shaft at the Idaho mine is proceeding as rapidly as possible. About 200 ft of ground has yet to be opened through. When completed, this air shaft will give good ventilation from the tenth level to the surface. The Argenta mine has struck good pay ore and holders of stock are jubilant over their prospecie. Some of the machinery to be used on the Schmidt mine has been put in place, and work is being pushed rapidly ahead so as to get the mine in running order, as soon as possible. A drift is now being opened in the new incline of the Idaho mine 180 ft below the 10th level, or 1,150 ft below the surface. After this is fairly under way the work of sinking the incline deeper will be resumed.

RICHMOND.—*Transcript*, May 4: About one mile east of the Omega company's property, is the Richmond mine, on Diamond creek. For nine years past T. P. Merrill has had possession of thie claim. He has never worked it for himself on an extended plan, being about 70 years old, and too feeble to engage personally in its development. He has leased portions of it to private parties on different occasions, and it is ostimated that about $20,000 has been taken from the ground. The claim is surrounded on two sides with deep canyons, and the facilities for hydraulicing are first-class. It has recently been bonded to W. R. C. Smith, of San Francisco. It is understood that the terms of the bond are $10,000 cash—a very reasonable sum for the mine. The claim comprises about 1,000 square ft, a mere handful of which has been washed off in one spot where it peyed well.

PLACER.

MINING ITEMS.—Nevada *Transcript*, May 1: The Southern Cross and Polar Star mines, at Dutch Flat, are working very heavy material. Their dump is 300 ft below the tunnel, and is in Bear river. They have two tunnels, which will take out 50 acres to a depth of 200 ft. The earth will pay 20 cents a cubic yard, which is very rich. The Cedar Creek company has only 48 ft of fall, and it is thought will not run 10 years. They have washed off their mines to a depth of 175 ft, and have now between 175 and 200 ft of their best dirt below the present surface. The Bonanza mine, at Gold Run, dumps into Canyon creek, a tributary to the American. The bed is inclined so steeply that all the tailings go out, and the mine could be worked forever if it would hold out. It is on the Blue Lead, and is very rich on the bottom. The bedrock is cleaned up carefully, and a good deal of coarse gold found. A chunk worth $160 was picked up a little while ago, and pieces from the size of a grain of wheat to several ounces are frequent.

SIERRA.

LA PORTE ITEMS.—Cor. *Messenger*, May 3: Most of the mines are doing well. The Union claim, at Gibsonville, struck something rich a short time ago. The Highland Mary company, at Wahoo, have let a contract for the raising of a shaft from their tunnel, and are confident of striking pay in a short time. The Secret Diggings company of this place are cleaning off a large quantity of ground, more having been run off thus far than was anticipated would be got off in the whole season. At the annual meeting of the Highland Mary company, held a few weeks ago, the President, Secretary, and trustees were all re-elected.

NEW STRIKES.—Last summer a number of citizens, of Sierra City, located a mining claim on the South branch, about four miles above the city, and commenced work upon the same. A few days since they reached the channel and found a large body of blue blue gravel, which prospected 50 cents to the pan. The owners are jubilant, believing they have valuable property. The tunnel is 350 ft long. A Spaniard by the name of Martini has struck a rich gravel deposit about two miles above the old Phœnix quartz ledge. The prospect is said to be a large one. Recently Capt. Irelan, Rock creek, in 600 ft with his tunnel, raised up 15 ft, striking gravel, and out of three carloads realized $8; average pay per carload for 17, afterwards taken out, $1. Good prospect of continuation of pay channel.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, May 7: The south drift from the winze below the 2600 level, is now 54 ft in and continues in excellent ore. The bottom of the incline is in a very likely-looking body of quartz, giving assays from $10 to $90, the greater proportion of which is gold This lies next to a clay seam varying from four inches to one ft in thickness, dipping to the west This formation has been penetrated about 15 ft. Toward the bottom of the incline the slips of clay in the ore-body dip toward the east. The quartz is very kindly in its appearance, and the surrounding porphyry shows iron freely.

SIERRA NEVADA.—The incline is making better progress below the 2300 station, the bottom continuing to cut a formation of hard quartz containing alternate seams of high and low-grade ore. A seven-inch Cameron pump has been put in the bottom, and the water gives very little trouble, although the flow continues strong. Ore continues to be shipped to the Mariposa mill, which will soon be started up. One of the pumps for the east shaft has arrived.

MEXICAN.—The joint Union upraise from the 2200 level to meet the winze coming down from the 1600 level, is making three ft per day, and is now 100 it upon the slope. Water has rendered the increase of depth to the winze slow, the average gained being less than two ft per day.

CON. VIRGINIA.—The yield of the mine is about 150 tons per day. The joint west drift, 850 level, is averaging five ft per day through hard, blasting porphyry, and is now 124 ft in length. The hoisting for the mine is now done through the Con. Virginia shaft.

JUSTICE.—The west crosscut, 1150 level, continues to cut seams of quartz and low-grade ore. Crosscut No. 1 west, 1550 level, has cut into a fine vein formation which carries more and heavier stringers of quartz as the drift is driven toward the wall. The Waller Defeat workings continue their accustomed yield.

BELCHER.—The main incline has reached a depth of 142 ft on the slope between the 2600 level, and is making downward at the rate of three ft per day. The south drift, 2550 level, is now 390 ft in length, and in favorable looking ground.

CALIFORNIA.—The yield of ors has been 285 tons daily. Owing to repairs to the machinery at the C & C shaft, no hoisting is being done for the California. The final clean-up for April has been made and shipped. Total for the month, $430,013.24.

BULLION.—The only work going on in the mine the past week has been sinking the incline winze below the 2150 level. As soon as it is a little further down the engine will be placed at its top.

BEST & BELCHER.—An average of three ft per day is being made in sinking the Osbiston shaft; total depth, 650 ft. Five ft per day have been added to the length of the drain tunnel.

LEVIATHAN.—The face of the south drift, on the 730 level, has run into a very favorable looking formation of porphyry, quartz, clay and heavy streaks of low-grade ore.

BROFUY.—The work of development through the North Bonanza tunnel is making excellent progress. The ground looks favorably, showing quartz and veins which are mineral bearing.

NORTH BONANZA AND FLOWERY.—The water has run down so as to give but little trouble. Six ft per day is being added to the length of the drift north from the first station.

GOULD & CURRY.—The joint east drift, 1700 level, is being extended toward the perpendicular of the Gobiston shaft at the rate of five ft per day. A 20-inch air pipe has been extended to the face, giving needed ventilation.

WARD.—The main shaft is down 1,415 ft. The water coming in is increasing in temperature. The east drift, 800 level, is now in 545 ft.

SILVER HILL.—The north drift starts 410 ft east of the incline. The 1300 level will be reached in the incline about Saturday.

LADY BRYAN.—Still sinking; drifting north and south on the 600 level and crosscutting east at a point 135 ft south of the main east drift.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—The water comes up in the shaft at the rate of about five ft per day and has a temperature of 128° Fahr.

EXCHEQUER.—The work of placing the new Con. Imperial air compressor is delaying operations on the 2400 level.

CALEDONIA.—The winze below the 1600 level is being continued, and is without material change. The Formen shaft is making usual progress Total depth 625 ft.

HALE & NORCROSS.—The joint Mexican winze below the 1600 level has made slow progress of late on account of water but is now doing better. Its total depth is 385 ft on the slope, the bottom in favorable vein matter. Six ft per day are being added to the length of the main north drift 2000 level, and it is now in 245 ft from the south line.

JULIA CON.—The work of repairing the caved drift, 2000 level, has been interfered with by the breaking of the pump which allowed the water once more to flood the floor of the drift, rendering the temperature high again.

YELLOW JACKET.—The new shaft has reached a depth of 2487 ft. The work of excavating is making good progress, nine ft having been made.

UTAH.—The work of lowering the large V-bob has been completed and it has been set up at the head of the incline. A new track is being put in the incline.

ALTA.—The joint, three compartment incline winze has reached the 1750 level, and the work of chambering out the station at that point is progressing favorably.

SAVAGE.—The retimbering of the incline is being continued as usual, as also is the work of repairing the drift, 1600 level, connecting with the Curry.

CROWN POINT.—The winze below the 2500 level is being continued on down and is 230 ft on the slope in depth.

TROJAN.—The mill has been set to work on 1000 tons of accumulated ore. Development on the 3d level is being prosecuted as usual.

CON. IMPERIAL.—The new air compressor is in place, but all connections not perfected so as to put the machinery into operation.

SUTRO TUNNEL.—The sub-drain is making satisfactory progress, the work being extended over 10,000 of the 20,000 ft.

MT. HOOD & VANCOUVER.—The work of drifting to the ledge on the 1400 level is making good progress. Everything works well and the water flowing into the shaft is easily haddled.

BELMONT DISTRICT.

BELMONT.—*Courier*, May 3: The mine is looking well. They have during the week started a drift from winze at a depth of 70 ft running east on the vein, and is showing richer ore every foot they advance it. The belief is now that it is going to be a larger body of ore than any ever found in the mine. The 50 level running west is in 19 ft in a 3-ft vein of quartz, one-third of which is fine ore. Have advanced the 300 level drift from shaft 22 ft, from south raise 10 ft.

BROUBRIDGE.—They will soon have the sump sunk deep enough, when work will be resumed on the 6th and 7th levels as usual. The mill was shut down on the 25th until such time as the different works and stopes are in shape.

EUREKA DISTRICT.

EUREKA TON.—*Sentinel*, May 1: Mining operations have been continued through the week without any material change, except in the 13th level, where the indications for ore are more favorable. The following work has been done in the different levels: 4th, north crosscut continued 22 ft, and now in 97 ft; 5th, east drift continued 22 ft, and now in 40 ft; 13th, started drift running east from crosscut No. 1, and made 16 ft. West drift from crosscut No. 1 continued 19 ft, and now in 29 feet. Incline continued 10 ft, and now down 40 ft below station.

NEW ENTERPRISE.—A new tunnel enterprise is about being inaugurated at the head of New York canyon. The Atlantic and Pacific Tunnel Co was incorporated a short time since, with R. Sadler, as President; W. P. Steichelman, Secretary; O. P. Burgess, Superintendent; T. W. Pearson, treasurer. The object of the association is to develop, by means of a tunnel, certain mining claims on Prospect mountain near the head of New York canyon. Among the claims belonging to the company are the Lantern, Sagebrush, Welch King and East Oakland. The length of the tunnel will be about 1,000 ft, cutting the ore belt at a depth of about 750 ft. The ground is regarded very favorable for rapid progress, and it is believed that the tunnel can be run in eight months. All of the above mines show well at and near the surface. On the Lantern in particular the ore has been followed down to a depth of 250 ft. The rest of the series are believed to be equally as valuable. The company is organized with 100,000 shares, 25,000 shares of which will be set apart for a working capital.

PARADISE DISTRICT.

WILLOW CREEK.—*Silver State*, May 5: The Ethan Allen ledge crops for several hundred ft along the side of the mountain in which it is situated, and is from 15 to 50 ft wide. The owners have cut into the croppings some 8 or 10 ft and find that it is all ore which averages over $100 to the ton in silver. Some mining men from Virginia City have been to examine the mine with a view of purchasing it. All the Willow creek mines are situated at the extreme head of Willow creek, on a ridge between the forks of that stream, some six miles from Camp Scott, in Paradise valley, and about a mile north of the summit of the range which divides Paradise valley from Willow creek. Six promising ledges have been located on the hill in which the Ethan Allen is situated, and the whole surface of the ground in the vicinity is covered with ore.

REESE RIVER DISTRICT.

WESTERN NYE.—Belmont *Courier*, May 3: The Lodi ledge, owned by Holman & Hawke, situated about two miles north of the Illinois works, is prospecting well. At a depth of 160 ft on the incline they have a well-defined ledge seven it wide of free milling ore, which assays from $300 to $600 per ton. This ore is chloride and black metal with some galena. The Downey company ore working 18 men. They are down on the incline 600 ft, at which depth they have a fine looking 9-it ledge of gray carbonate ore and galena; the latter is richer in silver than any of that character found before found. Capital is all that is wanted to make this a splendid property, and that is confidently expected to be along soon. The company are still sinking. Among the new developments in Mammoth district may be noted the San Francisco ledge, owned by G. E. Crowell, and situated near the summit of the Mammoth range, about two miles from the town of Ellsworth. Mr. C. has followed the ledge by incline over 40 it, and has a large and well-defined ledge of milling ore, assays from which run as high as $1 500 per ton. Other ledges in the vicinity are showing well, and capitalists from Virginia City contemplate taking hold and erecting a new mill there. Thomas Mitchell, a well-known millman from Tybo and Belmont, has taken charge of the Alexander mill as foreman.

SILVER STATE DISTRICT.

JOTTINGS.—*Silver State*, May 5: Men are steadily at work on the Blue Bell and Blue Jay claims. They are now sinking a perpendicular shaft on the Blue Bell, and expect to cut the lead this week. In Jungo district, three or four companies are at work and the prospects for good mines are very flattering, as the ore on the surface is rich and the ledges well-defined. A fine body of ore was cut in the Ohio ledge on Willow creek last Saturday. G. W. Hinkey reports the Bullion looking larger and richer where they are now at work on it, than the Rough & Ready did on the surface. The Bullion is now producing the richest kind of ore, and there is a large body of it in sight. The Sedan mill is running on ore from this mine, and the bullion which it is producing will speak for itself.

ARIZONA.

TOMBSTONE.—*Star*, May 1: Parties recently from Tombstone report everything in a flattering condition. Work is being rapidly pushed on the Lucky Cuss mine, and the Contention is still going down, and will soon reach 200 ft, every day being a guarantee of its stability and permanence, the richness and quantity of the ore being well established. At present the Toughnut has quite a force, and work is being rapidly pushed forward, large quantities of ore of more than ordinary richness being taken out. A great deal of assessment work is being done at present in this wonderful district. The mill at Charleston is nearing completion, and is expected to commence operations shortly. The Vizana, adjoining the Toughnut, upon which a considerable amount of work has been done, at a depth of 15 ft, shows a large body of ore assaying $1,000 per ton.

GLOBE.—*Silver Belt*, May 2: The Chamber of Commerce, owned by Hise, Hills & Co., is looking very fine. They have let a contract for a 30-ft shaft. S. Klein & Co. received 15 ounces this week of gold bullion from Gold Hill district; 13 ounces of this was from five tons of Golden Eagle ore, worked in an arastra. There are still 25 tons of ore on the dump awaiting reduction, which assaye $51 in gold and 30 ounces in silver. S. Klein is pushing work on the Bohemia, which is looming up. This is one of the most flattering prospects in the district, having the richest character of silver ore from the surface to the bottom of the shaft, 40 ft, which is sunk in ledge matter entirely, consequently the width of the vein has not been ascertained. The El Capitan still yields profitably to its owners. Twelve tons of good ore, assaying over 500 ounces per ton, is at the mill awaiting reduction. The proprietors are preparing stoping ground with a view of extracting large quantities this summer for milling.

OREGON.

MINING NOTES.—*Sentinel*, April 30: New diggings have been discovered on Dutch gulch, a tributary of Briggs creek, in Josephine county, and miners are flocking in and locating claims. The Palmer Creek company have cleaned up and suspended for the season. The result proves the mine to be a valuable one. Klippel, Hanna & Co. have commenced piping in earnest, with excellent prospects. This company will have water during the greater part of the summer. Water has commenced failing in most all of the mining camps of this and Josephine county, and a clean-up will soon be made. The season has been a very short one, but the returns promise to be good, nevertheless. A. McKenzie, Superintendent of the Centennial mining company, at Willow Springs, will return to Oakland, Oregon, this week. He expects to secure a "Little Giant" while absent, and return next fall to continue operations on a larger scale. The news from Briggs and Silver creeke continues encouraging. A man from the first-mentioned creek arrived at Grants Pass yesterday, who reports $200 men in that locality. Most of the men have claims, and ground sluicing has been commenced in earnest, with good prospects.

A LAW prohibiting opium smoking in Nevada under a penalty of $1,000 fine or two years imprisonment went into effect on May 1st.

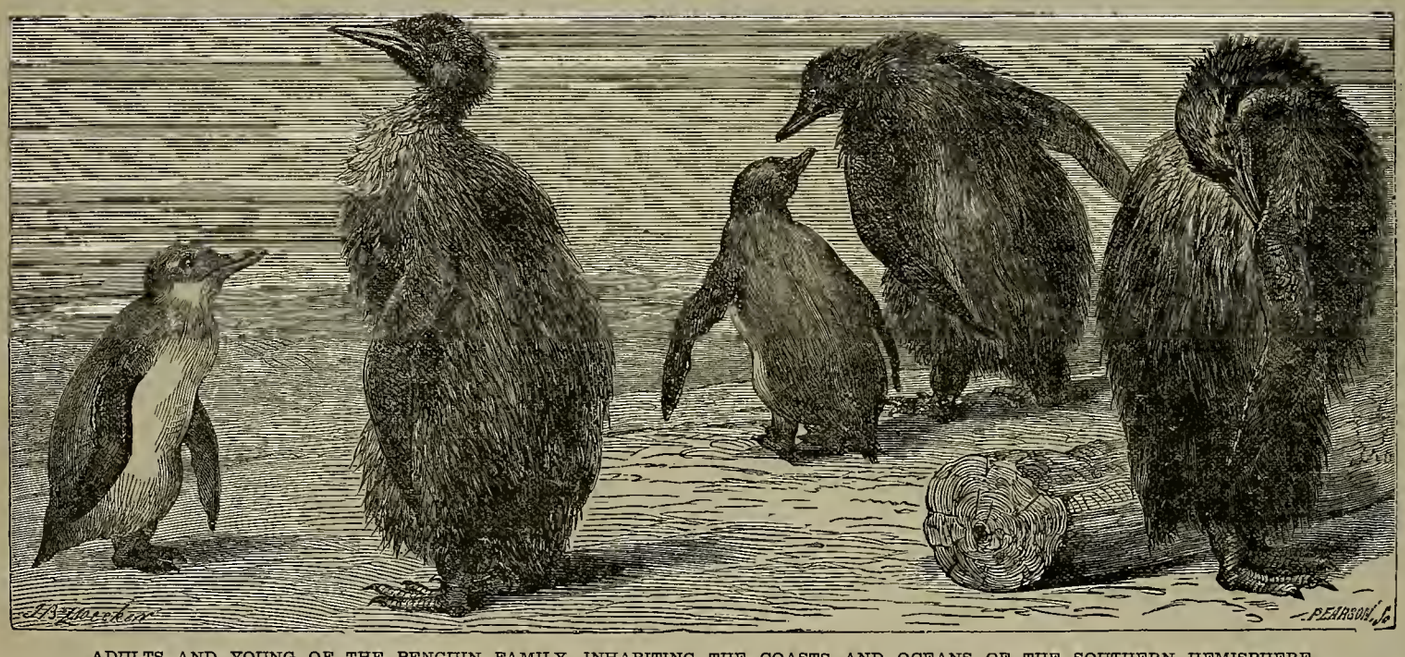
THE New York exposition for 1883 will take place at Port Morris, Westchester county.

A Group of Penguins.

Our engraving shows a group of interesting hut decidedly ugly hirds. They are of the penguin family, the name penguin heing a corruption of "penwing" or "pinwing," meaning a hird that has apparently undergone the operation of pinioning or pinwinging, as it is, in at least one part of England, commonly called. Although the name penguin has been applied to sea fowls inhahiting northern coasts, it is now restricted hy naturalists to hirds representing a peculiar family *(Spheniscidæ)* exclusively inhabiting the ocean and coasts of the southern hemisphere. These hirds shown in our engraving are of the *Spheniscidæ*. According to the classification of Dr. Elliot Cones there are four genera and twelve species included in the family *Spheniscidæ*. From an article in Johnson's encyclopedia, written hy Theodore Gill, we learn that most of the penguins inhahit the colder regions of the southern hemisphere, and species have heen found in the Antartic seas as near the pole as travelers have penetrated. All the species live in communities. They are incapable of flight, hut are very powerful swimmers and their wings are used as fins. They live along the coast and when at rest sit upon their tarsi in an erect position, as shown in the engraving. In this posture, too, they walk, or rather waddle, till they approach the sea, when they throw themselves in, and are again at ease.

According to Dr. Kidder "no living thing that he ever saw expresses so graphically the idea of *hurry* as a penguin when trying to escape. Its neck is stretched out, flippers, whirring like the sails of a windmill, and hody wagging from side to side as its short legs make stumhling and frautic efforts to get over the ground. There is such an expression of anxiety writteu all over the bird, it picks itself up from every fall, and stumhles again, with such an air of having an armful of hundles, that it escapes capture quite as often hy the laughter of the pursuers as by its own really cousiderahle speed." One can easily appreciate this humorous sketch by noticing the awkward outline of the hird in the center of the engraving. The little chap upon the left can also he laughed at. He stands with his flippers hanging down in a disconsolate manner, and reminds us of the little figures we have often seen standing in the snow at the Eastern schoolhouse door, waiting and shivering until the schoolma'am puts in an appearance and unlocks the door.

Of the peuguin in general it is said that the water is their natural element, and in this they disport themselves with ease and grace. They are expert divers, and hy repeated incursions into the depths, catch the fishes, crustaceous and mollusks, upou which they feed. The females lay one or two eggs cach, according to the epecies, generally in slight depressions of the ground or in hurrows.



ADULTS AND YOUNG OF THE PENGUIN FAMILY, INHABITING THE COASTS AND OCEANS OF THE SOUTHERN HEMISPHERE.

A Curious Cave.—Some time since N. Bell, of Pinos Altos, while out hunting near the Mogollon mountains, came upon a large cave which, upon examination, was found to contain carved stone images, and various other articles of human workmanship. The cave is of natural formation, being about 100 feet in length by 20 feet wide and 7 feet high. The walls are elahorately ornamented with grotesque figures, wrought in colore the brilliancy of which is still well preserved. Mr. Bell had no time to make a thorough examination, hut satisfied himself with hringing away euch of the images, etc., as he could conveniently carry, purposing to return at an early day and complete his examination. One of the images, measured about two feet in length and weighed nearly 40 pounde.

Fine Gold.

It is a fact that has heen long known, says the *Idaho Statesman*, that fine gold is very generally and evenly diffused throughout the gravel and sand which have heen deposited hy the water dnring the ages that the Snake river has been gradually subsiding and finding its way down to its present channel and course. Throughout the entire course of the river, these gravel and sand deposits cover extensive areas along each hank of the stream, all marked hy the same general character, except where the river passes through mountain rangcs where the gravel is confined to the present hed of the stream. Efforts bave heen made from time to time to work these gold-bearing deposits, hut the gold proved to he too fine to he saved hy the process then known, though at some points considerahle mining was done, and in some cases with fair results.

Since the introduction of the new process for saving fine gold, all douht as to the value of these placers has given place to certainty. In no single instance where the ground has heen worked hy the new process has there been failure to realize satisfactory results. Already a large numher of claims are worked at various points along the river for a distance of over 200 miles. New enterprises of all kind are daily heing commencod and during the present season and the next nearly every mile of this section of the river will have a series of gold-saving machines at work. It is true that the cost of the plates and the expense of getting to work on a claim require some capital to hegin with, but as the gold is known to exist in paying quantities nearly everywhere, there will always he men of sufficieit means ready to engage in a husiness which has heen proved to he so profitahle.

Compared with coarse gold placers there will not he so many men employed; but there will not he the fruitless prospecting, the mauy failures nor the large nnmher of men who in coarse gold placers are often out of employment and woree than idle.

Placer mining on Snake river will not throw so much gold out of the ground in as short a time, hut as an industry it will he more permanent and enduring and more certainly remunerative for those engaged in it. The numher of people engaged in the husiness will increase as rapidly as the machines are multiplied, and everyone thus engaged, whether as employer or employed, will he doing a perfectly safe business.

The winters are never severe along the river and snow never falls deep enough to prevent work. Mining can he done for nearly every month in the year.

The mines will last for many years and the yield per claim will he ahout as great one year as another. While they are heing worked, they will afford an excellent market for the farm products of the neighhoriug plains and valleys. Long before they are exhausted, the problem of irrigating the fertile sage lands of the Snake river plains will he solved hy the ditches which will he taken from the river ahove and extended over the plain. Indeed the cultivation of the sage lands near the river and the mining operations ou the hars will in may instances he prosecuted together.

A New Way of Working Steam Expansively.—A. Mullcr, of Cologne, connects a numher of turhines in a common casing, the diameter of the turhines gradually increasing. The eteam enters the smallest and escapes from the largest. This contrivance is said to he very economical either for eteam or under a head of water.—*Dingler's Journal.*

Distribution of Fish.

The Fish Commissioners continue their activity in the commendahle work of stocking the lakes and streams of the State with fish. They recently distrihuted 40,000 Cloud river and 50,000 Eastern trout, and also 10,000 catfish. The Eastern trout were placed in the summit streams and the Cloud river trout in the coast streams. The white fish recently hatched—40,000 in uumher—were put in Eagle lake, Lassen county, Donner, Tahoe and other lakes.

The 40,000 land-locked salmon ordered for California hy the United States Commissioner will not come this season. The weather has heen so cold in Maine and the temperature of the water correspondingly low that the hatching was retarded. The Commissioners have telegraphed not to ship the eggs.

Next month Livingstoue Stone, acting under the direction of the Government Commissioner, will hring out a car load of lohsters, striped hass and eels. The lobsters will he placed near the Heads or the Farralones. The hass will he distrihuted in the hay at points where the streams come in. The eels will he put in sloughs connecting with salt water. The eels hrought here three years ago have done well. Several have heen caught. One was three feet long.

Shad are becoming quite plentiful. Mr. Redding estimates that ahout 100 a week are caught. They are readily picked up hy cpicures, and therefore have not come into market. A fair sized shad is worth two dollars. They are taken mostly in San Francisco hay. Some, however, have heen taken at Monterey. Next year 500,000 more will he placed in the waters of this coast.

The aquarium car, which comes out uext month, will bring a lot of youug king carp of the kind imported from Europe to the Eastern States some years ago.

Mr. Redding is quite euthusiastic on the suhject of raising fish for food. He says every farmer who has a windmill on his place can with little expense arrange to raise all the fish needed for a family and have plenty to spare. Mr. Davis, who resides at Brighton, near Sacramento, has a reservoir containing 100,000 perch, carp and catfish. Some yeare ago he dug out a reservoir of ahout a half acre in area, and when his windmills were not at work irrigating, the water was diverted into the fish pond. The depth of water on the average is three feet. He stocked the reservoir with fish, and now has an abundant supply for hie own use and some for the market. Mr. Redding saye other farmers can do the same thing and save large expense for meat.—*S. F. Bulletin.*

The Future of Leadville.—Leadville will continue to he a prospcrous mining camp, settling down to a town of a few thonsand inhahitants, hut will never he the city that eome have predicted. Nothing will grow there. There is no soil, and there is ice formed every night in the year. It rains every day from the middle of June until the last of Septemher, all the time in the afternoon, hut the mornings are frosty and icy. Thcre is absolutcly nothing to sustain it but the mines, and when these hecome located and all the paying leads are found, and the day of prospecting is over, theu will Leadville settle down into a prosperous and thrifty town, hut never a live, hooming city. It is too high up for a health resort, and those looking for health would do well to stop 3,000 or 4,000 feet helow. There is not a foot of ground within four miles of Leadville, in the direction where ore has heen found, that is not now taken up; and all of the mining region within four miles of Leadville is shingled over four inches deep—that is, covered with conflicting claims.—*Denver Tribune.*

The Engineer.

The Suez Canal.

Mr. Farman, U. S. Consul-General at Cairo, Egypt, furnishes the Department of State with an interesting article on the Suez canal. His facts are derived from authentic sources. A few of them are selected of remarkahle interest. The entire cost of the canal was $92,273,907. The stock of the company consists of 400,000 sbares, at 500 francs each. These shares have sold as low as 100 francs each. At the opening of the canal they had advanced to only 300 francs. They are now quoted at 717 francs, and are prohahly worth more. The British government paid ahout 568 francs. The numher of shares hought, in 1875, hy Lord Beaconsfield was 176,602. This great purchase, aside from its political and commercial advantages, thus affords a clear profit of 25,000,000 francs at present prices. The halance of the stock is held hy a large numher of persons, mostly in France. The revenues of the canal have increased from 5,000,000 francs in 1870 to over 30,000,000 francs in 1877. The expenses, including interest, sinking fund and lands, have heen a little over 17,000,000 francs per year. While the revenues steadily increase, the expenses are decreasing or stationary. Deducting the amount paid for interest and the sinking fund, the actual expenses are ahout 5,000,000 francs annually. The cost of cleaning the canal and its accessories is only ahout 2,000,000 francs per annum. The small comparative cost of maintaining the canal arises from the fact that there are no locks or lateral emhankments to he broken. Except the ordinary cleaning, there is little to he done. Vessels drawing 25 feet of water or less pass through the canal. The saving of distance to the British ships going to India is nearly 5,000 miles. Two-thirds of all the vessels passing through the canal carry the English flag.

Monsieur Ferdinand Lesseps, who has heen at the head of the enterprise since its heginning in 1854, expresses the opinion that the Panama canal mnst he constructed without locks to he successful or remunerative.

The Railways of the World.

The growth and development of the railway systems of the world have heen truly wonderful, and, as year hy year goes on adding to the numher and extent of these avenues of intercourse, the figures hecome formidahle. There are now 82,000 miles in the United States, an increase of 2,486 miles since 1877. The outlook is very flattering for a still greater increase in 1879, if the many plans now under consideration are put into execution. By a comparison of other nations it will he seen that this country stands far ahead of all othere in the extent of its railroads:

United States	82,000	miles
Germany	17,181	"
Great Britain	16,794	"
France	13,946	"
Russia	11,555	"
Austria	10,852	"
British India	6,527	"
Italy	4,815	"
Canada	4,200	"
Argentine Republic	990	"
Egypt	975	"
Peru	960	"
Brazil	836	"
Turkey	830	"
Total	172,461	miles.

To properly appreciate the advantages of the railway syetems one might imagine the commerce of the world carried on in the old-fash-

ioned way. Think of the world of traffic that glides over these lines in a day, a month, and a year, and calculate, if one can, how long by teams, over muddy roads, through morass and jungle, and swamp and over desert plains, it would take to do the transportation which these railways do in a single day, and some conception may be formed of the magnitude and importance of the world's railway system.—*Chicago Commercial Advertiser.*

SUBMARINE WORK IN NEW YORK HARBOR. Gen. Newton has resumed work for the season on Diamond reef, between Governor's island and the Battery, having sent down the scows with apparatus for submarine mining. He finds that a heavy deposit covers the reef, but not of such hardness as to admit of the use of drills and explosives. A hose, with priming attachments, is therefore employed, preparatory to reducing the surface of the rock by other means. At Flood rock, in Hell Gate channel, work has been steadily prosecuted with a small force, the general plan pursued being similar to that adopted in the large submarine excavations at Hallet's point, so that in course of time the bed of the river will be dropped into the artificial chambers beneath by an explosion. Workmen are also engaged in removing fragments of rock from the old "crater," left by the grand explosion two years ago. The above is the substance of information obtained at Gen. Newton's office.

AN ENGINEERING FEAT.—Owing to the immense weight, the iron shoes in which rests two of the spans of the long Lehigh Valley railroad bridge at Easton, Pa., lately sank about an inch, throwing the bridge out of grade. As it was certain that the depression would continue, owing to the fact that the inside masonry of the pier is less solid than the outside, an iron casting 2 feet long, 3 feet 3 inches wide and 3 inches thick, weighing 7,000 pounds, was successfully placed under the span, in order to elevate them. The spans weigh 180 tons each. Hydraulic jacks were used. The spans were raised, the masonry redressed, the castings placed in position and the spans lowered without the stoppage of a single train. This is the greatest engineering feat that has been attempted and successfully carried through in this region.—*N. Y. Day Book.*

A DYNAMITE SHELL that can be projected against the hull of a ship, and insure its destruction or, at least, its serious damage, is affirmed to have received the favorable opinions of the Russian naval authorities, who, in view of the notoriously bad record of torpedo-boats during the late war, in attacking the war-ships of the Turks, and the great improvements that have been made of late years in devising effective modes of defense against this form of attack, have been engaged in devising some plan of employing explosive charges against hostile vessels. The invention of the dynamite shell above alluded to is said to have given them great satisfaction. A more detailed account of this novel weapon of offense appears in the Boston *Journal of Chemistry* for March.

A GREAT WORK.—Our citizens are scarcely aware of the progress which the Southern Pacific railroad is making toward forming a connection with railroads in the Mississippi valley. The Southern Pacific railroad is now actually completed for a distance of nearly 900 miles. It is 874 miles from San Francisco to Maricopa Wells, Arizona, and the road is already completed some miles east of that town. It is but 883 miles from San Francisco over the Central Pacific railroad to Salt Lake—Ogden. So the Southern Pacific railroad forms an outlet for San Francisco trade equal in length to the Central Pacific, a work which was considered a marvel a few years ago.

SPEED ON NARROW-GAUGE RAILROADS.—In a paper recently read by Graham Smith before the Liverpool Engineering Society, a statement frequently made that sufficiently high rates of speed cannot be got out of narrow-gauge roads is contradicted. Mr. Smith cites the Festiniog line in North Wales, where 35 miles an hour is not unknown, although the gauge is only one foot 11½ inches. Of course the lines must be properly laid out and constructed. In 1869 this line carried 9,700 passengers and 136,700 tons of goods, and was not worked up to full capacity.

GAS ENGINES.—The introduction of gas engines, says the *Engineer and Mining Journal*, has attained to remarkable dimensions in Germany and England (especially), where engines of this class as high as 30 to 50 horse-power have been built. Mr. Robert Grimshaw, reporting upon a recent visit to the Gasmotorenfabrik, Deutz, notices that a 50 horse-power gas engine, for a beet sugar factory, was in course of construction there. The gas companies, in view of the large consumption, furnish gas at very reduced rates for such engines.

BRIDGE MATHEMATICS.—To estimate what a bridge will cost any city if it is done by contract: Take the highest figures presented by any engineer and multiply them by the length of the bridge in inches, point off two places, and then add enough to prosecute any one who has anything to do with handling the funds, and the result is—that the bridge is an obstruction to navigation.—*Detroit Free Press.*

USEFUL INFORMATION.

Colored Pencils for Glass.

The following formulas for the composition of pencils for sketching on glass, porcelain, etc., are those used at the factory of A. W. Faber, of Stein, near Nurnberg, Germany:

1.—BLACK.

Lampblack	10 parts
White wax	40 parts
Tallow	10 parts

2.—WHITE.

Zinc white	40 parts
White wax	20 parts
Tallow	10 parts

3.—LIGHT BLUE.

Prussian blue	10 parts
White wax	20 parts
Tallow	10 parts

4.—DARK BLUE.

Prussian blue	15 parts
Gum Arabic	5 parts
Tallow	10 parts

5.—YELLOW.

Chrome yellow	10 parts
Wax	20 parts
Tallow	10 parts

The colors are mixed with the fats in warmed vessels, levigated with the same, and are then allowed to cool until they have acquired the proper consistency for being transferred to the presses. In these the mass is treated and shaped similarly as the graphite in the presses for ordinary pencils.

MILK AND ITS ENEMIES.—When one thinks of the foes which beset milk in its normal condition, it is a wonder it does not sooner fall from its high estate. It is indeed a substance which affords a most favorable foster ground for many growths which destroy its character and transform it from a thing of sweet nutrition to an offensive mass of decay. The cheese and butter maker, the milk seller and the milk drinker, are always in arms against a host of evils which threaten the material they employ and enjoy. Some idea can be gained of the variety of these evils from an interesting exhibition which was lately made at a German dairy fair by Prof. Ferdinand Cohn, of Breslau, and which consisted in drawings of the fungi which attack milk and its products. Descriptions of the exhibit enumerate: *Mucor racemosus*, the *Dictyostelium mucoroides*, the *Oidium lactis*, so common in sour milk, and the *Penicillium glaucum* or blue mold. A second group included the bacteria met within milk, among which were the *Bacterium termo;* the *Bacterium lacticum*, Cohn, the exciting cause of sourness of milk; the *Bacillus subtilis*, var. *butyricus*, or butyric acid bacterium, the cause of rancidness of butter; the *Vibrio synzanthus*, the bacterium of yellow milk; the *Micrococcus prodigiosus*, the bacterium of red milk; the *Bacterium syncyaneum;* the *Bacillus Anthracis* of Cohn; the *Micrococcus candidus*, and many others. "What countless evils do environ," etc. Is it any wonder that excellence in dairy products is only obtained at the cost of great skill and unceasing care?

IMPROVED MOLD FOR CASTING COPPER AND ITS ALLOYS.—It is customary in the use of molds in which brass or copper, or alloys of copper, are poured in a molten state, in order to produce cylinders or other articles, either hollow or solid, to cool them by the application of water, either by pouring it on the mold or placing the mold partly in water. Messrs. Waldenstrom & Summer of Manchester, propose to produce an improved mold for casting copper and its alloys by making the metal forming the mold hollow instead of being solid, as hitherto. Through the chambers or cavities thus made in the substance of the mold they cause water to circulate, and thus produce the cooling effect. In the present method of casting brass cylinders from which tubes are made much time and labor are expended in moving the mold for the purpose of cooling, preparing it for a fresh casting, and replacing it into a suitable position to receive the molten metal, but the improved system of cooling prevents this, the molds are rendered more durable, and better work is produced. By turning steam or warm water into the cavities in the substance of the mold they are enabled to warm the mold before commencing work, so as to get it quickly to a suitable temperature to produce a good casting.

GREEK BREAD.—The ancient Greeks used covered terra-cotta utensils, called *cribanoi*, which were pierced with holes in their circumference, and were the prototypes of the modern "Dutch ovens." After the dough was put in they were surrounded by burning coals, and the heat, penetrating by the holes, gave a more uniform temperature than an ordinary oven. After the reign of Pericles, Athens became renowned for the skill of its bakers and its cooks. They made 20 or more kinds of bread, some of which were very white and of excellent flavor. Plato reports that, a century before his time, a Sicilian baker, named Thearion, had made great improvements in his art. The Cappadocians made a very delicate bread, like Vienna rolls, by adding to the wheat flour a little milk, oil and salt.—*La Nature.*

SOLUBLE GLASS IN BRONZING.—Bottger varnishes objects of wood, porcelain, glass, or metal with soluble glass, and then shakes bronze powder over them.—*Dingler's Journal.*

TESTING IRON 60 YEARS OLD.—Two specimens of the old iron taken from the Belvidere bridge, recently demolished, have been tested by order of City Commissioner Tegmeyer. Specimen No. 1 (wrought iron), length 11 5-16 inches, was elongated to 12 9-16 inches and broke only at a strain equal to 52,836 pounds to the square inch. Specimen No. 2, length 10¾ inches, elongated to 12¼ inches, broke at a pressure of 61,880 pounds, equal to the best iron made at the present day. Another specimen was reduced ¾ inch and elongated from 9 to 9½ inches, and broke at a strain of 60,080 pounds. The bolts were placed in the bridge when it was built, 60 years ago. The tests were made by Mr. Wendell Bollman at his works.—*Baltimore Gazette, April 11th.*

CHLORIDE OF LIME AS AN INSECTICIDE.—*Le Cultivateur* remarks that rats, mice and insects will at once desert ground on which a little chloride of lime has been sprinkled. Plants may be protected from insect plagues by brushing their stems with a solution of it. It has often been noticed that a patch of land which has been treated in this way remains religiously respected by grubs, while the unprotected beds round about are literally devastated. Fruit trees may be guarded from the attacks of grubs by attaching to their trunks pieces of tow smeared with a mixture of chloride of lime and hog's lard, and ants and grubs already in possession will rapidly vacate their position.

ZINC.—It is surprising what an amount of zinc is consumed in the United States in the various industries into which it enters. Hundreds upon hundreds of tons are used for washboards, fruit-jar tops, platforms for stoves, fancy cornice works, candlesticks, trunk coverings, buttons, tacks, and many other uses, besides that which is converted into paint. Its uses are almost as varied as the uses of iron, and it is each day growing more and more into favor as it is better understood. Zinc will in time become a metal which will rank with iron in popularity, and will eventually supersede tin. Formerly nearly all the zinc used in this country by painters was obtained from abroad; but it is now furnished from our own mines.

THE FIRST LEAD PENCIL.—The statement that Eberhard Faber, the well-known lead pencil maker of New York, whose death occured recently, "built the first lead pencil factory ever known in America," is pronounced incorrect. William Monroe, of Concord, Mass., is said to have made the first lead pencil ever made in America, in 1811, and in a few years established an extensive manufactory of them, which he continued until his retirement from the business, in 1848. His pencils for many years were the best, and almost the only ones used in this country.

BLACK LACQUER FOR METAL AND WOOD.—Nine parts of shellac are dissolved in 50 parts of methylic alcohol and set aside for a few days. Then 10 parts of pulverized asphaltum are dissolved in 50 parts of coal tar benzine. Both liquids being mixed, a sufficient quantity of lamphlack is added to give it the required density. When necessary, it may be diluted with a mixture of alcohol and benzine.—*Chemiker Zeitung.*

GOOD HEALTH.

For Your Stomach's Sake.

Reader, do you recollect that you have a stomach? Or do you take no thought of your stomach and fill it up with anything which tastes good and comes handy? Or do you realize that the stomach manufactures strength for body and brain? Wouldn't you, were you certain that the eating of certain articles of food and the rejection of others make you, in two years, twice as strong, physically and mentally, as you are now; wouldn't you eat them? Because a clear head means cash. A muddled head means poverty. Brother, there's millions in eating the right stuff. Maybe you are more or less dyspeptic. Maybe you cram hot bread and fried ham into your stomach every morning for breakfast. Maybe you're pressed daily with business, neglect lunch and starve the stomach. Maybe all of us do. Maybe starved stomachs and eating food which tastes nicely but doesn't build up, recuperate or strengthen are the causes of our ills. Maybe we eat hearty meals and work like dray horses the moment we have finished. Maybe the man driving a good horse always allows him a half hour's rest after he has had his corn. Whoa! Maybe he doesn't allow that horse to eat after working until he's cooled off and his pulse is restful. Hey! Otherwise horse "founders."

Brethren, do we not founder betimes in that we take not so good care of ourselves as we do of our horses? Brethren, the greatness of a people depends on their intelligence! Intelligence depends much on a clear head; a clear head depends much on a sound stomach; a sound stomach may possibly be cultivated. It takes a live man to get along in the world; a half dead man lags far behind; a quarter dead man lags a little also. Brethren, some of us have weak stomachs left us as a legacy by our parents. Brethren and sisters, some of us now may be endowing weak stomachs on our offspring. Weak stomachs invite whisky, brandy or other stimulants. Will the ministers suspend their quarrels at the conference and depute one of their number to preach on this matter next Sunday? Hey!—*Daily Graphic.*

Unbolted Wheat-Meal Bread.

During the administration of William Pitt in England, there was a great scarcity of wheat, and in order to make it go as far as possible, Parliament passed a law that all the bread for the army should be made out of unbolted wheat-meal. History states that the result was such an improved condition among the soldiers as surprised them, and also their officers and surgeons. The latter declared that never before were the soldiers so healthy and robust, and that disease had nearly disappeared from the army. For a long time this kind of bread was used almost exclusively, but when wheat became abundant, its use was discontinued.

The use of unbolted wheat-meal bread has become greatly extended throughout the civilized world within the past generation, and every housewife should know how to make the very best article and have it constantly on the table. Children do much better upon it than upon bread made from fine flour.

In the State of Massachusetts they have normal schools where young men and women are educated for teachers at the public expense. In one of these schools, it is stated to us upon good authority, that the young ladies who come there to be educated are mostly from the rural districts, and that they are not well developed physically. Inquiry having been made into the cause of this, it has been found that these young women had not been well fed at home. They are brought up on hot biscuit and tea, and this does not supply sufficient nourishment to develop healthy bodies. The substitution of wheat-meal bread in all these cases would make a great difference in the physical development, health, longevity and usefulness of these persons.

CAUSE AND CURE OF SNORING.—A writer in the *Scientific Monthly* tells how the habit of snoring is acquired, and, better, how it may be cured: And, first, the cause: The air reaches the lungs through two channels, the nose and the mouth. The two currents meet in the throat just below the soft palate, the end of which hangs loose and swings backward and forward, producing the snoring. If the air reaches the lungs, as it should, through the nose, no noise will be made. If it reaches the same through the mouth, the palate will make more noise, since it is not the natural channel, but when it rushes through both these channels, then it is that the sound sleeper banishes rest from the pillows of his companions by his hideous noise. The remedy for snoring is to keep the mouth closed; and for this purpose Dr. Wyeth, the writer of the article referred to, has invented an article so cheap that anyone can make it, and no snorer should be without it. It consists of a single cap, fitting the head snugly, and a piece of soft material fitting the chin. These are connected by elastic webbing, which is connected with the head cap near the ears. This contrivance prevents the jaw from dropping down, and thereby renders snoring impossible. The great trouble will be to get people to adopt this invention, since the most upright and honest of men and women will rarely, if ever, confess that they snore, and will be very indignant if accused of it. As a further inducement to the introduction of this contrivance of Dr. Wyeth, it may be added that breathing through the mouth is very detrimental to the health, and that many diseases of the throat and lungs are contracted or aggravated thereby.

PERSONAL HEALTH AND COMFORT.—The following simple rules for preserving health and promoting personal comfort, if not new to some of our readers, are none the less important to every one. The object of brushing the teeth is to remove the destructive particles of food which, by their decomposition, generate decay. To neutralize the acid resulting from this chemical change is the object of dentifrices. A stiff brush should be used after every meal, and a thread of silk floss or india-rubber passed through between the teeth to remove particles of food. Rinsing the mouth in lime-water neutralizes the acid. A sun-bath is the most refreshing and life-giving bath that can possibly be taken. Always keep the feet warm, and thus avoid colds. To this end, never sit in damp shoes or wear foot-coverings fitting and pressing closely. The best time to eat fruit is half an hour before breakfast. A full bath should not be taken less than three hours after a meal. Never drink cold water before bathing. Do not take a cold bath when tired. Keep a box of powdered starch on the wash-stand; and, after washing, rub a pinch over the hands. It will prevent chapping. If feeling cold before going to bed, exercise; do not roast over a fire.

ANOTHER CURE FOR HYDROPHOBIA.—A German gamekeeper (W. Gassel), 82 years of age, states in the *Leipziger Zeitung:* "I do not wish to hurry with me my much-approved remedy against the bite of mad-dogs, but will make it publicly known; that is the last service I can render to the world. Take some warm wine vinegar and lukewarm water, wash the wound thoroughly, and dry it. Then pour a few drops of muriatic acid on the wound, because mineral acids destroy the poison of the saliva."—*Journal of Chemistry.*

MINING AND SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

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Delinquent Sale—Mount Jefferson M. & M. Co.

The Week.

The Constitutional hlast has been fired and the echoes of the explosion are still ringing in our ears. The atmosphere is yet too emoky for the exact determination of its effectiveness, but as the majority of counties have heen heard from there can he little douht but that the new organic law has been adopted. The election passed off very quietly—a matter of congratulation, considering the intensity of interest and hitterness of partizanship displayed during the campaign. To-day the lassitude attendant upon excitement and over-strained exertion is plainly visihle in all the partics, and with all there is a sense of relief that the crisis has been passed and the matter settled.

In general the mining interests will go on as if there had heen no election. The Constitutional change does not alter the quantity or quality of the ores in our mines, nor yet does it lessen the desire for their products. There may he restrictions created iu some directions hy the new order of things, but theee will in the main he counterhalanced by the good derived in others. Above all things, work must not be allowed to flag. For, whether under old Constitution or uew Constitution, an honest and contented livelihood can only he attained hy earnest and pereistent effort. The idle are the despondent, the depeudent and the discontented ones, and honest lahor under any. law seldom fails to attain euccess.

The Future of the Comstock.

The signs point just now to increased animation in the mining stock market, particularly in the shares of certain Comstock mines, in the lower levels of which a good showing of mineral has lately heen ohtained. As exploration proceeds here the speculative feeling grows apace, confidence keeping fully ahreast if not a little in advance of ore developments. This is not business like, but it is the hahit of those who deal much in this sort of securities, and hence must be looked for. This ilk are a sanguine people, apt to largely discount the first favorahle indications met with at these great depths, a hatful of ore here ohtained sufficing sometimes to iuspire wide-spread enthusiasm and create a great upheaval of the market.

We took occasion not long since to counsel men of small means not to dahhle in these Comstock shares; a caution which it may not be amiss, in a season of danger like the present, to repeat. The Comstock mines have, in times past, yielded a large amount of bullion. A few of them have been worked with great profit, paying for a short time liberal dividends. But the ore from which this production was made lay at much less depths than the new finds on which these mines must depend for a renewal of their prosperity. The chances are against the finding of any more large and valuahle ore bodies along the Comstock range at depthe much under 2,000 feet. Should any of these mines come into or again return to honanza, it is flot prohahle that very large amounts of ore will he obtained above the 2200 or 2300-foot level. The cost of ore extraction in these mines increases in a sort of geometrical ratio with depth. This is not so much on account of the greater trouhle of raising the ore and water, as of the increased heat and difficulty of ventilation, already so formidahle that the work of exploration ou the present lower levels proceeds very slowly. With a depth of a few more hundred feet attained there is danger that downward operations will be arrested altogether. The temperature of the air iu these levels ranges from 130° to 140°, the water stauding at 154° Fahrenheit. At the rate of increase ohserved ahove the air at a depth of 3,000 feet will reach a temperature of 160° or 170°; an atmosphere in which men cannot eveu live, much less work, and which would therefore force an entire ahandonment of tho mines.

These are matters that should be taken into consideration hy persons disposed to traffic in Comstock shares. That they have not heen overlooked hy some who were in times past largely interested in these mines, may he inferred from the fact that these partiee have lately heen drawing out of the Comstock and investing in mining properties elsewhere. The further prospecting of the Comstock should he left to be prosecuted by men with abundant means, who can afford to take many chances of failure when coupled with one of large success. They can pay out without feeling it an amount of assessments that would greatly distress a poor man.

It would he just as perilous to huy these shares for a turn in the market ae for a permanent investment. The outlook for the Sierra Nevada is as favorable perhaps just now as for any mine on the Comstock. Yet a property that is capable of advancing its market price from a few hundred thousand dollars to sixty or seventy millions and receding to five millions, all within the epace of a year, leaving everyhody in doubt after this feat is performed which set of figures most nearly represents its actual value, must be a dangerous one to meddle with.

Shifting the Centers of Financial Supremacy.

Heretofore London and Paris, more especially the former, have been the great finaoial centers of the world. In all past time they have heen the great marts for gold and silver, fixing their prices and regulating the rate of exchange between all civilized peoples. To these cities money seeking investment and all surplus funds have gravitated, and to them capitalists desirous of effecting loans and nations in the market as horrowers have gone for accommodations. The principal means wherehy England has gained, and for so long a time heen enahled to maintain this financial supremacy, have consisted of her manufacturing industries and immense carrying capahilities, the outgrowths of the free trade policy for which she managed to procure such general acceptance.

At last this great financial center seems likely to he shifted from the old world to the new. The halance of trade, formerly against us, bas for several years past heen largely in our favor, our exports last year having exceeded our imports by more than $250,000,000, preventing that amount of money from heing sent ahroad. We are producing hullion within the limits of the United States at the rate of a hundred millions a year. The consequence is the flow of gold and silver out of the country has heen etoppcd; credits are in our favor, and it looks as if exchange would before long he everywhere quoted on New York instead of London. Of these cities New York is, hoth hy reason of her geographical pceition and her industrial relations, the most central to the leading commercial nations of the eartb. Then, too, she has the advantage of greater proximity to the large gold and silver-producing regions of the present day, while our transcontinental railroads have brought her nearer to the Orient than is her British rival. We are a growing while England is a declining power, rendering such a transfer as is here alluded to altogether natural and prohahle.

While New York, taking up the reins that Brittania must drop, shall so grow and rule on the Atlantic, San Fraucisco will reach an early and great supremacy on the Pacific side of the continent. In the agricultural and mineral wealth of the coast and her far out-reaching trade her future is assured. While she continues as at present a great ore mart and supply point for the mining regious west of and adjacent to the Rocky mountains, her manufactures, more especially of mining machinery, must rapidly increase. From western Mexico and Central America on the south, and from British Columhia and Alaska on the north, these demands will hereafter multiply at an amazing rate, the extension of railroads into the interior rendering tribntary to her iuterests meantime new domains in that direction. San Francisco sits with New York, London, Paris and Hongkong in the zone that most controls the material interests of mankind, and may justly aspire to share with them this eovereign power. Besides enjoying all their natural advantages, she finde in her mines, her situation and surroundings resources peculiar to herself, and which must soon insure to her the financial consequence now pertaining to these other metropolitan towns. The present halt in her progress ie but the stopping of the strong man to girt up his loins for a fresh etart. San Francisco is young, unhurdened with debt and environed with innumerahle sources of virgin wealth. Her recuperative energies are of the irrepressible kind, and when she makes again a forward move, her advancement will he rapid, healthful aud permanent. Relatively her progress will he greater than that of New York or any of the large cities of the old world. Indeed, we know not where to look for the city that will keep pace with her, once she resumes her onward march; and this we may venture to predict, that whatever she may gain will not afterwards be lost. There may come a lull in her growth but no general decay till there shall be no more need for great cities on the face of our glohe.

Opening Up a New Mining Region.

Tho whole of northeastern Nevada ahounds with irregular mountain ranges alternating with broad valleye and harren plains, portions of which during the wet season are converted into shallow lakes. It is a dry, sterile and every way forhidding region, worth hut little for either grazing or farming purposes. There is, however, a small amount of good agricultural land in eome of the valleys, and upon which fair crops of grain and vegetablee could he raised with irrigation. There is everywhere bunch grass, the growth on the plains heing scattered and scant, but quite abundaut on the mountains, where also there is good water and some timber.

The mountains in this region were explored for the precious metals at an early day, prospecting parties having visited it even hefore the Washoe mines were discovered. It was in 1858 that Peter Lassen, the pioneer, was killed hy the Indians while out there on an errand of this kind. Two years later a large party from Virginia City visited and thoroughly examined this remote corner of the State, and finding good signs of mineral, organized a mining district named Puehlo, took up claims and done some work on them. Shortly after quite a large population gathered there, some of which settled on the land while others engaged in mining. A town was huilt, a sawmill put up and several hundred acres of land enclosed and cultivated. While this colony was so progressing the Indians became hostile, and attacking, killed some of the settlers and drove the rest out of the country, their houses, mill and other improvements haviug heen giving to the flames.

From that time until recently not much was done towards prospecting the mines or occupying the lands in that region. It appears from the Nevada papers that a party of miners has lately gone in there and re-locating the old claims, organized a new district, calling it Disaster Peak, this name having reference to the misfortunes that hefel the first set of colonists. The mines give good evidence of heing valuahle, and as there are no longer any Indians to deter prospectore the whole country will no doubt he thoroughly explored and its value for mining purposes be determined.

REVOLVING CYLINDER FURNACES.—As will will he seen from an advertisement in another column, Messrs. Rankin, Brayton & Co., of the Pacific Iron Works, are now enahled to give purchasere the licenses of *all* patent claimants in revolving cylinder furnaces, to wit: White, Howell, Thompson and the Stedefeldt Furnace Co. This will avoid all further litigation in reference to these rival claims.

THE late warm weather has caueed the snow on the Sierra Nevada to melt pretty rapidly. As a consequence the water in the mountain streams is reaching a high stage.

The Great Australian Exhibition.

We made a notice some weeks ago of the grand International exhibition which will be held at Sydney in September next. As this affords an opportunity for the display of California productions and manufactures in a part of the world where it is greatly to our advantage to huild up trade and commercial amity, we deem it timely to make farther allusion to the suhject. We had a conversation on Tuesday with Rev. Dr. John I. Bleasdale, who is acting under authority of the managers of the exhihition as their representative on this coast. He reccived the approval of the Supervisors of the city and county of San Francisco, and has heen given rooms in the New City Hall on Market street, where all interested in the coming display at Sydncy may call upon or address him. The Supervisors expressed their interest in the exhibition in these words: "There exists hetween the State of California and the Australian colonies the most iutimate commercial relations, the fostering of which should he our especial aim. Therefore thie board, heartily sympathizing with the projected International exhihition at Sydney, and desiring ite complete succese, earnestly recommends the mechanical, agricultural, commercial and other interests of this city and State to contribute thereto the products of their various industries."

Securing thie approval, Dr. Bleasdale addressed a letter to his Excellency Governor Irwin, setting forth the aims of the exhihition. Governor Irwin replied in the following words: "I am in the fulleet sympathy with the objects of the International exhibition to he held at Sydney, N. S. Wales, in Septemher, and most cordially recommend to the enterprising citizens of the State to do what they can to have a creditahle representation of the products of the State and its industries at the said exhihition."

Thus the movement to give ourState a representation at Sydney has received official recognition, hut it remaine wholly with individual producers and manufacturers to give the matter a taugihle form iu the shape of material for exhihition. It is true that the exhihition of our good things will occasion the pro-ducers or manufacturers some outlay for freights, hut it is promised that concessions will he made hy carryingcompanies. The different classes of objects which are desired for exhibition are outlined hy the acting commission in this city, as follows: "1. A compilation of statistics, relating to the population, social condition, commercial and indnstrial state of your city, town, shire or district. 2. Photographs of the most notable puhlic and other huildings in and around your city or town, and of the most agreeahle scenery in the neighborhood, or of various parts of yonr district, and in the case of gold fields, of some of the principal mines. The photographs should be of uniform size, 12 hy 10 inches heing preferred. 3. Exhihits illustrating the perfection to which the cultivation of grain and wool-growing has been brought in your district. 4. The cultivation of the vine and the olive, and their products. 5. The extraction of the precions metals. 6. The several industrial manufactures estahlisbed, with samples of their production. 7. Any raw product which may have a value for indnetrial purposes."

Dr. Bleasdale informs us that he is receiving quite a list of applications for space from our city merchants and manufacturers, and if the time were greater, douhtless quite a representative display could be had. Whatever is done must, however, he done quickly, and any of our readere in the interior who are disposed to contribute to the California exhihit, should not delay in declaring their intention.

It may he announced thue early that next year there will be held a grand International exhihition at Melhourne, Victoria, which Dr. Bleasdale will represent during his stay on this coast. This exhibition will be on even a larger scale than that held this summer at Sydney. The U. S. Government has already appointed commissioners to act for the Melhonrne exhihition, and it is fair to presume that our country will he fully represented.

ERUPTIONS IN THE HAWAIIAN ISLANDS.—In the latter portion of March last, the volcano of Kilauea was sending forth a lava flow of nnnsual volume, which is described hy the Hawaiian *Gazette* as follows: "There was a large lava flow just to leeward of the orater. A river of running lava of ahout a mile and a quarter long hy three-quarters of a mile wide. Looking towards it, it was a grand sight. The lava seemed to run to sea at the rate of about half a mile an hour. There is scarcely any fire in any part of the crater, except where the lava is flowing from, and it is still running. If it runs much longer there will he danger. There was some fire on the top of Maunaloa two weeks ago, and all the people in Kau expect a lava flow down there sooner or later. Tbey had a shock of earthquake at Kau ahout a week ago, and the people there are keeping a sharp lookout for what may come." From the foregoing, it would seem there are apprehensions of stirring times in the neighhorhood of the crater of Kilauea and Maunaloa, and we would not he surprised to learn at any moment of volcanic action of unusual violence. It is some yeare since there was any great out-pouring at Kilauea and Mannaloa, and it is hut natural that there should he a demonstration of nature at intervals, as heretofore. These things are looked for hy the natives, and eeeme to occasion no alarm.

American Gauging and Measuring Implements.—No. 1.

Accurate measurement lies at the fonndation nf all mechanical success. The workmen who carelessly applies his standard gauge knows that mnch dsponds npon the perfect identity in size which he arranges hetween the work in hand and the standard furnished him, but he seldom thinks of the tirelsss effort which has been undertaken to establish a standard. Until recently this work has mainly been entrusted to foreign mechanics, hut it is a theme for congratulation that Americans have now entered the lists with them and havs devised appliances for measurement which are unsurpassod for accuracy.

Our mechanical progresa in this direction was lately shown in a paper rend in February last before ths Franklin Iustitutc, of Philadelphia, by J. Richards, a member of the firm of Richards, Hand & Taylor proprietors of the American Standard Gauge and Tool Works, of Philadelphia, Pa. From this paper of Mr. Richards we shall take points of description and illustration which will shcw, at least in part, the achievements of Americans in tho linee we have intimated.

It is well known to everyone connected with engineering mannfactures, that the maintonance of nniform or atandard dimensions in machine fitting, ia fast becoming a rule and almost a necessity, enhancing the value of what is made, and at the same time cheapening the coat of production hy permitting a moro extended division of labor. The division of lahor in machine fitting, as in nearly all hranches of industry, depends on what may he called duplication, that is, producing one thing like another, so that different workmen may, independent of each other, prepare parts or pieces which can he assembled and put together without trying and hand fitting.

The export of American-made machines to Enrope, commencod, we may claim, hecause of an early and auccessful application of the gauging syatem. One of the first and most important orders received from Europe for machinery, was for a nearly complete equipment of implements for the Enfield small-arms factory, in England; machines and tools the maiu object of which was a duplication of their product. Watches, clocks, sewing machines, emall arms, with many other articles of a similar kind, are now made in this country and sold in Europe, hecause the system of gauging and duplicating offere an advantage ovsrhalancing cheaper lahor, cheaper material and more than 3,000 miles of ocean oarriage.

Referring now to machino shop gauges, it is well-known that most of our larger establishments have been supplied with atandard gauges imported from England, usually a set of pins and collars snch are shown in Fig. 1, and corresponding to what ia called the Whitworth standard. Most of these gauges are made in the works of the Whitworth company at Manchester, who hy long experience and their reputation for good work, have controlled this manufacture. Of late years, however, some fine examples have been made in this country, but at prices much greater than are demauded for English gauges.

Pins and collara—or cylindrical gauges as they are generally called—were, so far as we have any record, first made hy the celebrated John G. Bodmer, of Manchester, a Swiss engineer whn may he regarded as the compeor of Sir Joseph Whitworth, in machine tool improvement. For 30 years or more these pins and collars have been made with great exactness, the fitting snrfaces highly polished and in every respect a marvel of exactnese and uniformity.

In 1860 the writer, while engaged as a manager in the Ohio Tool Compauy Worke, at Columhus, Ohio, feeling the want of aome means of maintaining aizes and not having aufficient use for suoh implements to justify the purchase of a eet of pina and collars, conceived the idea of introducing eome cheaper syetem, hy which fixed calipers with some simple meana to keep them in adjustment, would take the place of pins and collars. The matter was followed up and calipers of several kinda were made, aleo a corrective gauge not differing much from the nne shown in Fig. 2.

A prevalent opinion exists that the British and Amerioan etaudards for lineal measure are not the same. This idea, I hav e heen informed hy Mr. John W. Nystrom, came from publications of the Smithsonian Institution, hut a moment's reflection must show how improhable it is that there is auy difference in the lineal measures used. The British standard is an arhitrary one, fixed after several years of lahor on the part of a learned commission and at considerahle expense. The pendulum test, which was the only natural one hy which experiments were made, was abandoned after thousands of readings ahowed its inconstancy. The French meter of the forty-millionth part of the earth's meridian, as well as all other natural atandards, were abandoned for the same reason, and the wisdom of this course has heen proved hy the French government siuce adopting an arhitrary etandard the eame as the English had done.

In thie country, while there has heen more spent in preparing comparative standards than by any other government in the world, there has heen no search, eo far as I know, after natural or other atandards. The equipment of implementa of transmission and for measnring, exceeds that of which any nther country can boast, hut ths principal wisdom shown in the matter, has heen in avoiding the useless expense of fixing an independent standard which might be anything.

By comparison, nnder similar conditions, a metal test rod adjusted at Washington and a similar one adjusted at London would show a difference due to ten degrees of temperature, and this is, no douht, tho only differenca. It is enough to know that gauges made to a carefully adjusted standard here will match and interchange with those made iu Englaud.

Proceeding, now, to notice more particularly the measuring machine shown iuside elevation at Fig. 3: It cohsists of a strong frame, ou the top of which are two traversing slides very carefully fitted and moved by screws. Ths contact points seen at the center are of hardened steel made parallel hy careful fitting. Ths idex wheels at each end are to count the revolntions of the screws or divisions of the samo. One of the screws has a pitch of eight threads to an inch for the ordinary divisions marked on rules and scales, and the other scraw is ten per inch for decimal divisioue.

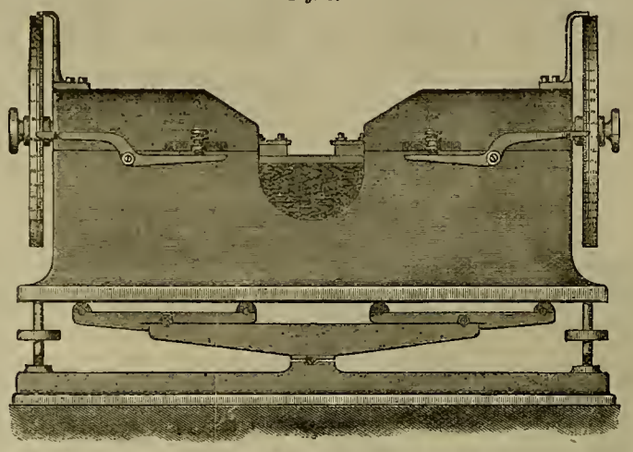
In measnring, the points are brought togother in easy contact to form a hase or starting point and then expanded hy turning one or the other of the wheels, or both, counting the revolutions or parts of revolutions to determine the distance between the points or the size of what is to he measured. On one aide the nnmher of diviaione is 1,000, hence with a screw of 10 threada to an inch, each division on the wheel equala 1-10,000th of an inch at the points.

The movahle indices on the front of the machine are to correct the imperfections of the screws on a principle which, so far as is known, was invented hy Prof. John E. Sweet, of Cornell University.

The two sot screws seen in front and resting against the upper surface of the index hars are attached to and move with the slidos of the machine, and the ehape of the surface on which these acrews slide may he called a diagram of the screw's imperfections. In the drawing, straight lines are shown, hut practically the lines are neither straight nor regular. The wooden throat piece sesn helow the points is removed when large pieces are to he put in the machine.

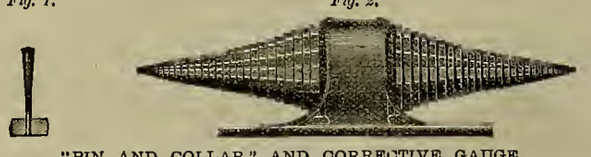
The machine is shown mounted on halance bars, which aeem superfluous with so strong a frame; nevertheless, hy setting up the screws heneath the ends of the frame, a very appareut change in the readings will bs seen.

Fig. 3.



AMERICAN STANDARD GAUGE AND TOOL WORKS' MEASURING MACHINE.

Fig. 1. *Fig. 2.*



"PIN AND COLLAR" AND CORRECTIVE GAUGE.

Another Smelting Process.—A series of experiments in ore smelting has heen in progress at Sacramento under a process patented by John A. Robertson. The furnace employed in making theee tests is a reverheratory, 28 feet in length, with capacity to reduce one ton per hour. The ore after roasting is dropped into a solution composed of sulphate of copper, cyanide of potassium and salt, and an additional ingredient, which constitutes the eecret of the patent, and which causes the ore when removed from the solution to crumhle readily, leaving the sulphurets pure. The ore is then ground and amalgamated, run into a settler and washed. The entire cost of treatment hy this method is said not to exceed four or five dollars per ton; the furnace nnd other necessary apparatus costing $1,600. The final results of this series of experiments will soon he given to the puhlic.

The steamer *Richmond* lately landed 758 emigrants in New York.

The Coleman Sluice—A Machine for Saving Fine Gold.

Our gold miners, both quartz and placer, are greatly in want of a machine or method whershy a larger percentage of tho excessively fiue particles of metal contained in the aurifsrous earths and orcs now being handled by them, can be saved. Of these gold-bearing stnffs that we attsmpt to work, competent judges are of ths opiuion that we now lose very nearly one-third of the total amouut of precious metal they carry, this heavy proportion making uot merely a temporary escaps, but being irretrisvahly lost. In view of a waste so large and complete, any mode or devico that promises to much dimiuish the same, claims special attsntion.

The importancc of effecting oven a emall gain in this respect finds apt illustration iu ths case nf the Suske River mines, where a largo numher of mon are likely to find steady and profitable employmcnt for many years through the introduction of silver-coated copper plates, which aerve to catch and retaiu much of the fiue gold that had escaped the apparatus hefore in use. A description of these plates and the manner of adjusting them in the sluices having been given in some comments on theso Suake River placers made hy us several wceka siuce, need not now he ropeated.

In further experimcnting with these machines, it has occurred to some of the miners on Suake river that their efficiency might he increased hy so corrugating the hottoms of their sluices that they could he converted iuto a serisa of quicksilver vats; one of the miners having written to the Press inquiring whether this idea has ever heen practically carried out, and if so, whether or not the arrangemeut is protected hy patent. To these inquiries we are prepared to give an affirmative answer. In July, 1869, Ezra Coleman, a resident of Sau Francisco, applied for and through the Mining and Scientific Press Patent Agency secured letters pateut for an invention of this kind. The bottom of the Coleman sluice, made of sheet copper or other metal, is formed into indentations, circular or triangular, running transversely across it After the sluice has heen set at the proper angle, these depressions are filled not quite full of quicksilver, thus forming an almoat continuous sheet of this metal, over which the water and gravel or the pulp passes. The hottom of this sluice may ho, and for the sake of giving it greater efficiency should he, coated with eilver, although this feature is not patented. As an appendage to this machine there is affixed at the lower end of it a copper plate, silver coated on the nuder side, for catching the float gold. This plate, which moves in grooves in the sides of the sluice, is placed at a low angle, and so nearly closed at its lower end that the space hetweeu it and the hottom of the sluice is kept filled with water, whereby the float gold is brought iu contact with the under side of the plate which catches and holds it.

One of these sluices can he seen in operation at Hendy's machine shop, corner of Fremont and Mission streets, in this city, where it performs its duties with a commendahle, not to say astonishing, efficiency. It is heing run on sand from Gold Bluff and our various auriferous ocean heaches; material from which it has heen found impossihle to extract more than a small proportion of the gold it contained hy any working processs yet invented. This machine it is claimed will save every particle of precions metal, even to the minutest atom of float gold; the latter heing caught hy the inclined plate at the lower end of the sluice. Even gold leaf thrown in above is here arrested without having suffered appreciahle loss, and a more erucial test than thia could hardly he instituted. It is claimed that this is the only machine in which any special, or at least effectivs, provision has been made for seiziug and detaining the float gold; an end that is here compassed hy applying the arrssting surfsce ou the top of the water where these light atoms swim, instead of placing it below where very few of them can be reached, as has heretofore heen practiced. This, though of secondary importance, is still a valuable feature of ths Coleman invention. Attached to this slnice is a quicksilver box, and at its lower extremity a trough furnished with a rsal aud an adjustahle false bottom, hy the shifting of which latter the trough can be made desp or shallow, as required. This trough, which can he multiplied to any extent necessary, is desigued for saving sulphurets, and will therefore he used chiefly iu quartz mills.

In operating this machine, the most of the gold is fonnd in the upper two or three riffles, so effectually do the latter perform their work. The water and gravel, as they traverso the sluice, plunge into the mass of quicksilver resting in the transverse depressions along ita bottom and striko the lower aide of the riffle. Reacting, they are forced again through the quicksilvor aud made to impiuge against the upper side of the riffle, where the gold that has escaped amalgamation is captured and retained, this constant agitation of the quicksilver keepiug it lively and in coudition for active aervice.

The iuventor states that expericnce proves this to he the best implement for saving microscopic gold yet invented, and in view of the large quantities of thia material to be operated upou, prnvided it can he handled successfully, its prospective importance cau hardly he over-rated. For washing the auriferous heach sands, which have heretofore hafflled almost every endeavor directed to their profitable treatment, this sluice appears to he especially well adapted. These sands, after heing passed through it, are so completelv divested of their gold that scarcely a trace of that metal can, hy fire assay, be detected in the tailings. Should the machine, on more extended trials, show itself well suited for this field of operatious, it will afford remunerative employment to thousands of men and greatly enlarge the gold product of both California and Oregon, for these heaches reach far north into the latter State. Recently rich sand of this kind has heen discovered on the hay shore at Santa Cruz, hut the gold is so infinitesimally fine that only the smallest wages can he made at washing it. Even the sand found last fall south of the "Golden Gate" contains a fair quantity of gold, hut for the same reason nothing could he done with it. Within the past few weeks the discovery of placer digginge is announced in Santa Barhara, and in other counties to the south; hut nearly everywhere the same trouhle presents itself, rendering these finds of little avail. With the aid of the Coleman sluice it is altogether likely that moderate and perhaps large wages could he earned at every one of these localities, except that lying to the westward of the city. Even on Snake river the earuings of the miners might, through its use, he materially increased. We cannot, in fact, see why it could not he employed to advantage in hydraulic and every other branch of placer operations, as well also as for saving the fine gold and the sulphurets in quartz mills.

The inventor of this implement is ready to treat with parties desirous of using it, on easy and liheral terms; the reason that he has not sooner sought to introduce it to the attention of the mining puhlic heing that he was, immediately after takiug out letters patent, appointed Superintendent of a mine on the Comstock, which position he continued to hold until a short time since. He is now prepared to hnild, at the machine shop mentioned, as many of these sluices as he may have orders for, and to sell the right to its use to such as may require it.

Quicksilver Movements.

The market for quicksilver, under unabated production and coutinued low prices, remains sluggish. The combination long talked of, and at one time deemed imminent, fails of final consummation, leaving to the mine owner hut a scanty profit. Heavy shipments of this metal were made to China last month, hut whether to meet consumptive demands or to find its way hack to this port, as considerahle quantities have done, is not quite apparent, prohably the latter, as that market has never heen without full stocks. Quicksilver has in fact heeu used for some time past instead of exchange on that couutry. As a consequence this metal has accumulated there to an extent that has rendered its re-shipmcnt to this market profitahle; some 8,000 flasks having, it is said, heen imported within the last few months from Hong Kong. The charges attending the delivery of quicksilver in thnt port are less than one cent per pound; for the round trip not more than one and three-quarters cents per pound, hardly greater than would attend the carriage of silver hars or coin. The quantity of this metal shipped from San Francisco hy sea during the first four months of the present year amounts to 18.389 flasks, valued at $561,618, against 7,923 flaska, valued at $267,449, during a like period last year. Of the shipments made so far this year, 13,320 flasks went to China, and 3,694 to Mexico; Japan, Peru and Australia taking from 300 to 500 flasks each. and Central Americn a much less quantity. China has taken more thau five times as much and Mexico nearly twice as much quicksilver this year as last, and there ie no douht hut the consumption in the latter country will increase rapidly in the future,

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To Hydraulic Miners.

The public generally and Hydraulic Miners especially are hereby notified that any parties making or using the contrivance known as the HOSKIN DEFLECTOR will be prosecuted to the full extent of the law, said machine having been declared by the U. S. Circuit Court an infringement upon my patent, the

Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

HENRY C. PERKINS,

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No. 1 (XX) is the Strongest Explosive Known.
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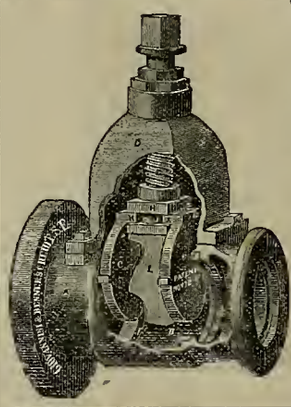

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We are also prepared to execute all orders in Brass Work for Breweries, Distilleries, Plumbers, Gas and Mining Apparatus, Ship Work, Soda Apparatus, Steam Fittings, Meters, Gauges and Indicators. Also in Machine Pattern and Model Making, and Clock Work. Gear cut to order. Brass Castings of all kinds. We are confident of our ability, and all orders entrusted to us will be executed with promptness and dispatch.

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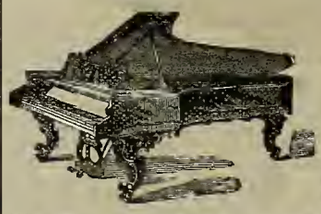

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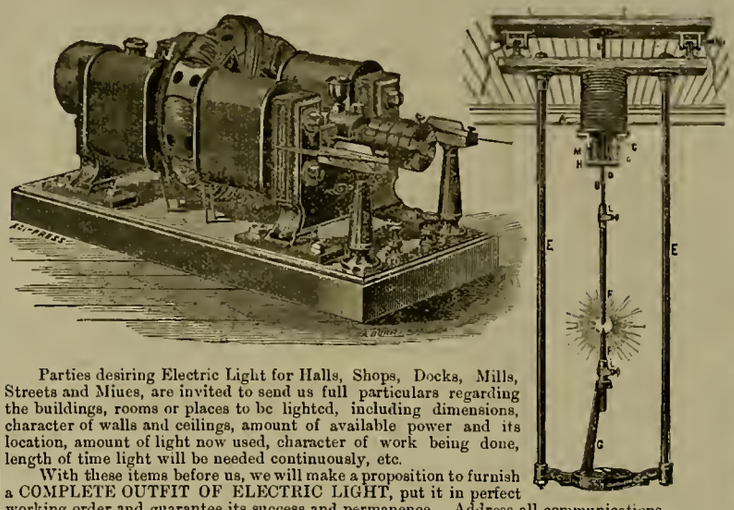

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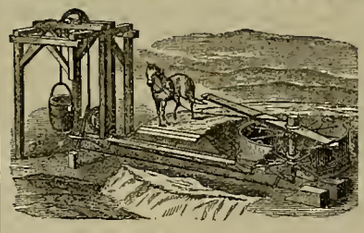

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Consulting Engineer & Metallurgist,

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702 CALIFORNIA STREET,

Author of— San Francisco.

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The Prospector's "Wee Pet" Assayer, (Patented)	100 00
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Blow-pipists' Pocket Laboratory of Tools, Fluxes, etc.	50 00
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How to Stop this Paper.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Notions about California.

It is passing strange what notions about California are promulgated hy those who ought to know better. Persons who pass a brief sojourn here, dnring which they have perhaps been wholly engaged in some special line of thought and work, go away from us and are impelled to hetake to themselves wide experiencs and general viswe concerning California conditions, to which psrhaps they scarcely gave a moment's thought while they wers yet with us. Tbis is the most charitable view to take of the statsments of these people, and charity is a good thing to cherish even toward the most mistaken of the human kind. The New York *Tribune* has found one of these philosophical critics in the person of "an Easteru journalist who has returned from California after three years' experience of newspaper work in San Francisco." We are sorry this person did not cling to observations concerning his individual life here, becauss he fails utterly when he undertakes generalizations. For example, what stupid nousense this is, as applied to the people of California generally: "The people care very little ahout what goes on in the East. Their attachnient to the Union is not strong. If there should ever arise a second secession movement it will not be in ths South, but in California. One often heare talk of a Pacific Coast republic." This is eimply a hase slander upon the people of California.

Upon the subject of lands and agriculture in this State this person's viewe are a most curious medley of truth and nonsense. They are described as followe:

> There is much complaint of the ignorance and carelessness of Congress with regard to tbe interests of the coast. The land legislation, for example, is all adapted to a region of vcrdure, and is consequently not at all adapted to an arid, sage-brush region where agriculture depends on irrigation. There is not much inducement for emigration to California, and none at all for men to go without capital. The policy of the great landowners is to discourage immigration. Their plan has been to divide society into two classes, wealthy proprietors and a proletariat. I am glad to see that a few landowners are taking a new course and dividing their immense estates into small tracts. California would support double or treble her present rural population, but the land system must be radically changed and the facilities for irrigation developed and utilized. Pretty much all the land tbat can be profitably cultivated without irrigation is already occupied.

This is a fine example of generalizing from half-truths. It is true that the land legislation does not wholly apply to a State which presents such wide extremee in natural conditions as prevail in this State, but the area to which it ie inapplicable is small compared with that which it suits very well. But the conclusion which this authority reaches is not strange when it is seen that he looks upon California as "an arid, sage-brush region, where agriculture depends upon irrigatiou." Thoss great districts of our State where the rainfall is apt to he excessive and crops often suffer therehy, will have their own opinion of a critic who classes them "arid" and a "sage-brush region," and prescribes irrigation for their drenched fields. There is, it is true, need of eome system which will hring irrigation to the parts which need it, and some modifications, as for example in the timher-culture act in the dry valleys, might be made to the advantage of settlers, but these, though important, are not sweeping in their character.

The statement that "large landholdere discourage immigration" is a queer commentary on the tireless efforts which have been made by these large landowners, to fill the world with reports of the possibilities of their lands—efforts which have at timee been over-zealous and have suppressed the conditions requisite to success. That these men as a rule are anxioue to populate their lands is seen in the many colony enterprises which they have promoted and which are now projected in large numhers. This writer puts his limitation in the wrong place. It is the many not the few who are dividing their estates and, with occasional exceptions, the few would he glad to divide if the demand warranted ths division. It is true that there is little inducement to come here to those who have no money to start with, hut it is not because thers is not land enough to huy, hut hecause they could not buy an acre if the world were at auction. It is true that irrigation would open many areas for settlement in small tracts, hut it is not true that there is lack of land on this account. It is true that there is room in California for douhle or treble her present rural population, and it is also true that tbe disposition to change the "land system" is progressing more rapidly than the chance to make the change is developing. There are other statements in the quotations which we make ahove which are not true in the sense they are presented, hut we have said enough to put our Eastern readers on their guard against all such generalizations, and that is all we have space to do at this time.

THE famous run between Chicago and Council Bluffs of Jarrett and Palmer in 1876 was beaten on the 2d, by seven minutes.

Two horse thieves were pursued from Eureka, Nev., hy sheriff and posse, and one robber was killed and the other captured.

THE situation at St. Petershurg still continues alarming and the rigorous police regulatione are to be made still more etringent.

Important Mining Decision.

The Suprems Court of the United Statss has just made a decision that should cause prospectors to see to it in locating claims, that they run with ths lode taken up and not diagonally or at right angles across it. The case passed on was that of the Flagstaff Silver Miniog Co., of Utah, plaintiff, in error, vs. Helen Tarbet, in error to the Supreme Court of Utah. The controversy in this cass, remarked Justice Bradley, in delivering ths opinion of the court, relates to respective rights of two miuing companies in the Little Cottonwood district, Utah, who are working subterraneously upon the same lode or vein of ore. The principal question involved is whether the Flagstaff company has a right to carry its excavations underground outside the perpendicularly drawn side lines of its surface location, when by so doing it infringes upon the rights of the adjoining claimant. With regard to the important questions of following lodes or veins of ore helow the surfacs, and the respective rights of contending parties in such casss, this court holds as follows: First—Location of a mining claim upon a lode or vein of ore should he laid aloug the same lengthwise of its course, at or near ths surface nnder mining act of 1866 and that of 1872. Second—Each locator is entitled to follow ths dip of ths lode or vein to an indefinite depth, even though it carries him outside of sides lines of location, hut this right is based on the hypothesis that the eide lines substantially correspond with the course of the lode or vein at the surface, and that it is hounded at each end by the end lines of the location crossiug the lode or vein, and exteuded perpendicularly downwards and indefinitely in their own direction. Third—If the location be laid crosswise of the lode or vein, so that its greatest length crosses the eame, instead of following the course thereof, it will secure only so much of the vein as it actually crosses at the surface, and the side lines of the location will become end lines thereof for the purpose of defining the rights of owners. Fourth—A locator working subterraneously into the dip of a vein bslonging to another locator who is in possession of his location, ie a trespasser, and liable to action for taking ore therefrom. In accordance with these principles, this court holds that the Flagstaff company is outside its rightful houndaries, and it therefore affirms the judgment of the lower court in favor of Helen Tarbet.

Anderson.

This town, centrally located on the Reading grant, is about one and a half miles west of the Sacramento river, on the northern hranch of the C. P. R. R., 11 miles south of its present terminus at Reading. On the east eide eeveral important tributaries enter ths Sacramento from courses which make Anderson the natnral freight aud passenger distributiug point for a large extent of country which is now settling up and increasing in importance—including the Pitt river, Fall river and Modoc country. Many milee of naturally good roads tbus lead off in different directions from Anderson. A large body of fine bottom land liee adjacent.

During the last year the general business of this village has largely extended. Its hotel, livery and postoffice business has more than doubled. Mr. Elias Anderson, the veritable godfather of the town, is postmaster and a highly respected citizen. He established the American Ranch hotel on the Oregon wagon road near the preseut town site some 20 years ago. Last summer he moved a large and eubetantial building into the center of town, which, with additione then made, render the A. R. H. a good traveler'e home, especially under the careful attention of himself and family. Mr. Anderson keeps no har. The "Anderson hotel" (formerly Snow's) has been douhled in size and a ealoou added.

Mr. Edward Frishie, proprietor of the grant, with a large and nobly grown up family, resides near this town.

Wright & Bedford transact a large hardware and general merchandise business. Lovell'e livery stahle, Bell's saloon, Dr. Anderson's, D. P. Quinn's, P. Phifer's and several other residences have hsen built during the past 12 months. The American Ranch hotel is heing again enlarged. Other huildings are in contemplation. E. F. Anderson, Welle-Fargo and Railroad Station agent, inform us that the freighting business increased about douhle last season. Also, that the establishment of a wool, hide, fur and produce purchasing and sale agency, with ample means, would greatly promote business and favor the convenience of merchants and shippers further in the interior.

The increased cultivation of the Reading grant hy suhdivision sales and renting, with other advantages, insures Anderson a steady if not a remarkably rapid growth.

ARRANGEMENTS are heing made to ship Chinamen from here to the South to fill the vacancy left hy the negro exodus.

OREGON parties are going from Umpqua Ferry with mining outfits, to placer diggings at Olalla that yield $2 to $5 a day.

GRANT has arrived at Hong Kong.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING APRIL 29TH, 1879.

214,000.—PILLOW-SHAM FRAME, ETC.—John R. Adams, Oakland, Cal.

214,807.—FRUIT DRIER—R. B. Blowers, Woodland, Cal.

8,691.—SPOKE-TENONING MACHINE—R. W. Eaton, Watsonville, Cal. (reissue).

214,819.—TIN PAIL—Etienne Guittard, S. F.

214 835.—SYSTEM OF LIGHTING—E. J. Molera and J. C. Cebrian, S. F.

214,975.—ANIMAL TRAP—Geo. W. Williams, San Diego.

214,862.—PISTON PACKING—Samuel A. Youse, Sutter Creek, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent husiness for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CUT-OFF ATTACHMENT FOR DIRECT-ACTING ENGINES.—A. H. Mathesius, S. F. Dated May 6th. This invention relates to certain improvements in direct-acting engines, such as are principally intended to drive eteam pumps, hammers, rock drills and similar machiues, and it consists in the employmeut of a cut-off attachmeut to the steam cylinder, by the use of which the actiou is rendered much smoother, and in certain details of construction, which would be difficult to describe clearly without ths aid of engravings. The steam may be cut off at any point. Iu order to prevent the pressure of steam within the cylinder from being reduced too much below that of the steam chest, which might sometimes happen from too great expansion, small tension valves are employed which are secured to the main valve opening into the ports, provided with springs, eo that when the differeuce in pressure exceeds a certain amount, the springs will yield and allow steam from the chest to yield and enter the cylindsr. By the construction of this cut off a softness is given to the stroke, making it without noiss or jerk, and with a considerable ecouomy of steam.

KING BOLT FOR TRUCKS.—Chas. Oester, S. F. Dated April 22d. This improvement is intended to be applied to trucke for carrying heavy weights, and refers more particularly to the construction and operation of the king bolt, or that portion joining the body of the truck to the front axle, about which the front wheels move in the arc of a circle. The improvements consist in the application of a coiled spring around the king bolt, above tho axle, in such a mauner as to lessen the jar incident to thie part of tbe vehicle and insure a more perfect action of the forward axle and wheels. It also consists in a method of enclosing the spring out of the way of the dust; in a misane of oiling the bearing; and in certain detaile of construction, hy which the improvement is rendered efficient for the purpose for which it ie intended.

FIRE EXTINGUISHER.—Wm. R. Ferguson, Dixon, Solano Co., Cal. Dated April 22d. This invention relates to improvements in that class of fire extinguishers in which a chamber is used for storing an alkali, and inside of the chamber is a fragile vessel containing the acid, meane being provided for breaking the vessel containing the acid and throwing its contents into the alkaline substance, so as to gain a pressure from the resultant gas. Mr. Ferguson's improvements consist in a method of forming a cover for the main chambsr in which the ingredients are placed, so ae to make said cover self-sealing and prevent any escape of gas; and also in a means of treating the acid-containing vessel or otherwise discharging its contents.

SPOKE-TENON AUGER.—Roht. W. Eaton, Watsonville, Santa Cruz Co., Cal. Dated April 29th. This invention relates to certain improvements in that class of spoke-tenoning machinee, which are intended to he clamped to the epoke while the tenon is heing made, and it consists iu a novel construction of the cutter head and in a means for adjusting and centering it upon the spoke. It also cousists in a novel means of adjustiug the mandrel of the tenon auger hy means of swivel supporting rings and operating screws, hy which either end may be adjusted indepeudent of the other and any desired angle ohtained.

MANUFACTURE OF BOOTS AND SHOES.—Joseph Hobart, Nordhoff, Ventura Co., assignor to Hobart, Wood & Co., of San Francisco. Dated May 6th. The improvements consist in securing tbe counter of the boot or shoe by means of rivets along its edges so as to prevent it breaking down and losing its shape; and also in continuing the counter past the vertical leg seam so as to prevent ripping of the leg seam at the point where it most frequently occurs, and preventing also any leakage at that point.

News in Brief.

INDIAN outrages are worrying Texas.

THE late shower reached Shasta county.

DURING April ths public debt increased $19,952.

ANOTHER stage robbery is reported from Arizoua.

Hay making has begun in the vicinity of Oakland.

THE bathing season has been opsned at Alameda.

HIGH water is causing trouhle in New England.

GERMANY is still wrestling with the tariff question.

THE difficulty hetween China and Russia has hsen settled.

THERE is a riot in Cork, many persons have been injured.

FINE salmon are caught in the locks at Orsgon City, Oregon.

SUMMER-FALLOWING is occupying farmers in central Solano.

THE Peruvian governmsnt has called the nation to arms.

THE hay crop is heing gathered in Los Angeles county.

THERE is a strike and riot on the Pacific railroad in Canada.

RAILWAY freights are less activs than for several weeks past.

THE spring wool clip near Woodland falls short of the average.

SZEGEDIN has hcen again desolated hy a violent hurricans.

TROOPS are to be used to keep trespassers ont of Indian Territory.

ADVICES from South Africa indicate that an early peace is prohable.

NEW railroad snterprises are about to be iuaugurated in Oregon.

ONE of the Manhattan Bank robhers has been arrested in Philadelphia.

THE military chest captured at Isandula contained $100,000 in gold.

THE Industrial exhibition at Berlin was formally opened on the 2d.

THE *City of Pekin* carried away two leprous Chinamen on her last trip.

CROPS are excellent along the Merced and on the sand plains of that county.

EASTERN papers are wet-blanketing the "Continental picnic" to meet Grant.

PRINCE ALEXANDER of Battenhurg has heen elected to the throne of Bavaria.

A RECENT cave killed 34 pereons and demolished five houses at Veas, Spain.

KATKOOAT, the Sitka, Indian murderer has been haoged at Portland, Oregon.

A CHINAMAN has opened an English school for his countrymen at New York.

UPWARD of 5,000 flasks of quicksilver were produced in California last month.

IN the Miles polygamy case on trial at Salt Lake ths defendant was found guilty.

RICH silver miues have bcen discovered in Indian Territory near ths Kansas line.

THE great earthquake in Prussia, March 22d, killed 922 persons and destroyed 21 villages.

THE Humboldt basin, from Tule to Battle Mountain, is alive with young grasshoppers.

SIERRA VALLEY rejoices in the appearance there of crickets, as an antidote for grass-hoppers.

THE Mexican government will appropriate $500,000 toward the expenses of the exposition.

THE London and Westminister bank has recently invested $35,000,000 in U. S. eecurities.

A FATHER mnrdered hie little daughter through religious fanaticism recently at Pocasset, Mass.

NO more whisky will ho sold from hars upon the Oregon Steamship Navigation Company's boats.

ONE HUNDRED and forty of the Southern negro refugees, have returned from Kansas to the South.

Quicksilver Mining Publication.

Memoir on the Mines and Works of Almaden, by M. H. Kuss, M. E. Translated from the "Annales des Mines" for the MINING AND SCIENTIFIC PRESS, by S. B. Christy.

CONTENTS.—PART I. Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Constitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines. PART II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. PART III.—Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. PART IV.—Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 224 Sansome St., San Francisco.

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EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., May 7, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, May 7, 3 P. M.

SILVER 75@80

GOLD BARS, 890@910. SILVER BARS, 8@19 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 494@49½ Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 88@89

LONDON (Consols, 98 9-16, Bonds, 104)

QUICKSILVER in S. F., by the flask, lb. 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending May 7, 1879.

HIGHEST AND LOWEST BAROMETER.

Apr 30	May 1	May 2	May 3	May 4	May 5	May 6
30.108	30.113	30.095	30.125	29.996	30.063	30.222
30.063	30.075	30.177	29.963	29.963	30.020	29.995

MAXIMUM AND MINIMUM THERMOMETER.

62.5	62	59	61.7	59	58.8	62
49.8	53.8	52.5	48.5	49.5	49	50

MEAN DAILY HUMIDITY.

81.6	86	55	62	74.3	73.3	61.3

PREVAILING WIND.

W	W	W	W	W	W	W

WIND—MILES TRAVELED.

335	250	308	248	194	488	237

STATE OF WEATHER.

Fair.	Fair.	Clear	Clear.	Clear.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

						.05

Total rain during the season, from July 1, 1878, 22.09 in.

ORDEA LAPHAM'S SEAMLESS CHEESE CLOTH. Less expense, no waste—saves trouble and time of making up the bandage. Seven sizes, for 13-inch to 16-inch Cheese. Samples by mail. Order at once.

WHITMAN & BURRELL, Little Falls, N. Y.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.—Location of principal place of business, San Francisco, California. Location of Works, Cherokee Flat, Butte County, California.

Notice is hereby given, that at a meeting of the Directors, held on the tenth day of April, A. D., 1879, an assessment (No. 41), of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary at the office of the company.

Any stock upon which this assessment shall remain unpaid on the twelfth day of May, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the tenth day of June, A. D., 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

R. N. VAN BRUNT, Secretary.

Office, Room 6, No. 318 Pine street, San Francisco, Cal.

Mount Jefferson Milling and Mining Company—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne county, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of March, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Condee, G M, Trustee	32	3000	150 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	44	800	40 00
Condee, G M, Trustee	48	2000	100 00
Condee, G M, Trustee	49	2000	100 00
Condee, O M, Trustee	50	2000	100 00
Condee, G M, Trustee	51	2000	100 00
Condee, G M, Trustee	54	1000	50 00
Condee, O M, Trustee	55	1000	50 00
Condee, G M, Trustee	58	11080	554 00
Fassett, N C	21	500	25 00
Fassett, N C	20	1000	50 00
Fassett, N C	22	500	25 00
Fassett, N C, Trustee	7	500	25 00
Fassett, N C, Trustee	8	500	25 00
Smith, O, Trustee	40	1000	50 00
Smith, O, Trustee	41	500	25 00
Smith, O, Trustee	42	500	25 00

And in accordance with law, and an order of the Board of Directors made on the 21st day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Tuesday, the 27th day of May, 1879, at the hour of three o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, Room 6, San Francisco, Cal.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

MISS FANNY DAVENPORT.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

GRAND OPERA HOUSE.

THOMAS MAGUIRE.....Manager.
FRED LYSTER.....Acting Manager.

ITALIAN OPERA.

Mission Street, near Third. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

B. MACAULEY.

Open every evening and Saturday Matinee.

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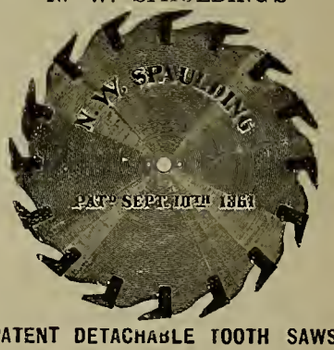

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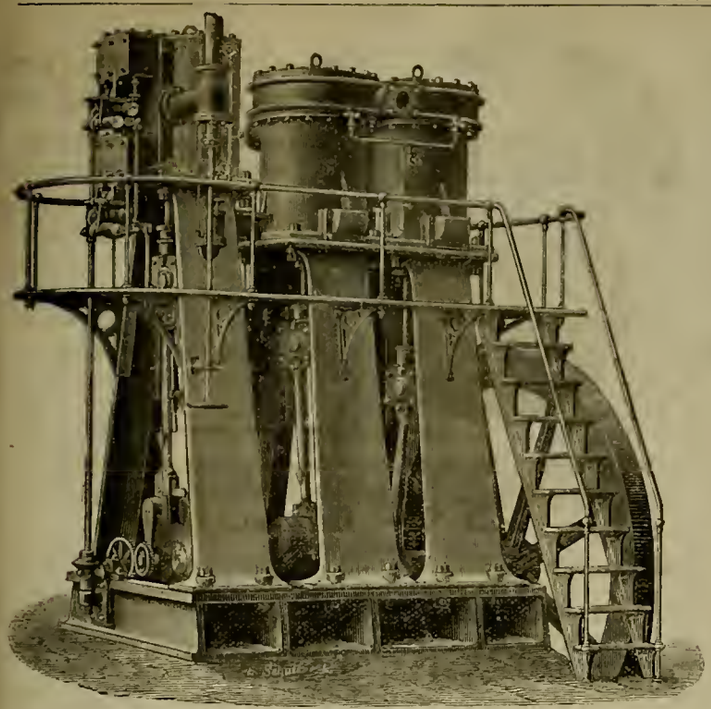

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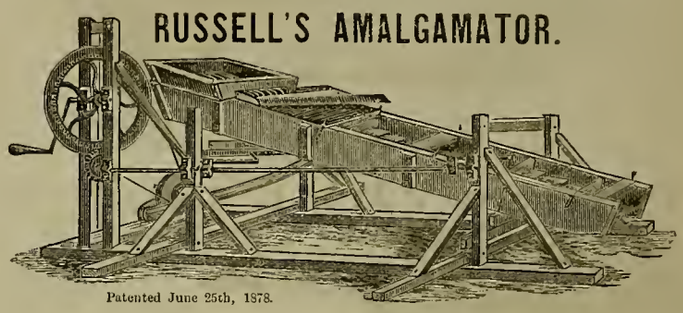

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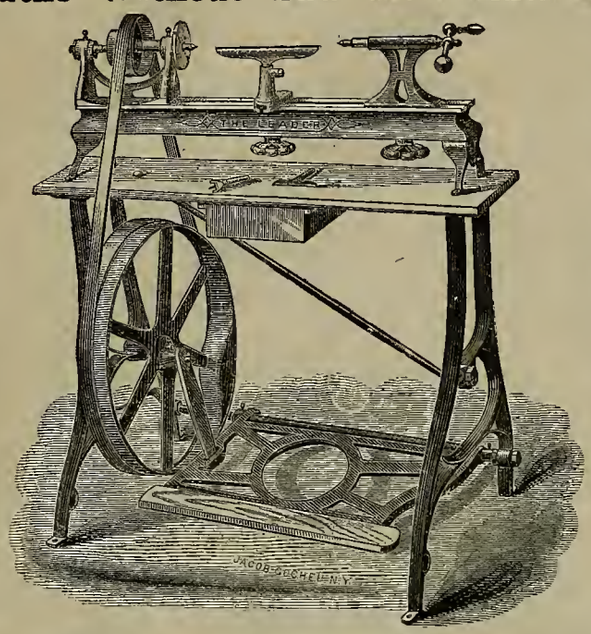

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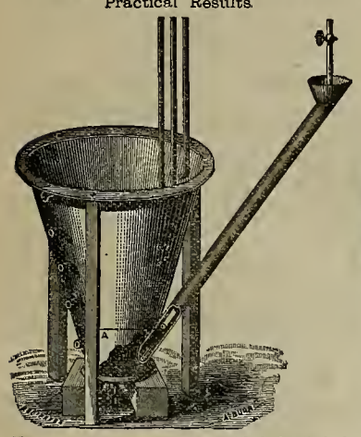

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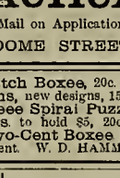

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MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, MAY 17, 1879.

VOLUME XXXVIII Number 20.

Geysers.

Prof. Joseph LeConte in his rocently puhlished work, "Elements of Geology" (Applston & Co.), in spoaking of goysers, says: In magnificsnce of geyscr displays, however, Icsland is far surpassed hy the geyser hasin of the Firehols river. This wonderful geyser region is situated in the northwest corner of Wyoming, on an slevated volcanic plateau near ths headwaters of the Madison river, a trihutary of the Missouri, and of ths Snake river, a trihntary of the Columhia. The hasin is only ahout three miles wide. Ahout it are ahundant evidences of prodigious volcanic activity, secondary volcanic phenomsna heing developed on a stupendons scale, and of evsry kind, viz: Hot springs, carhonatsd springs, fumaroles, mnd-volcanoss and geyssrs. In this vicinity ars more than 10,000 vents of all kinds. In soms places, as on Gardnsr's river, the hot springs ars mostly lime-depositing, and in othsrs, as on Firehole river, they are gsysers depositing silica.

In ths upper geyser hasin, the vallsy is coversd with a snowy deposit from the hot geyssr waters. The surfacs of ths mound-like, chimney-liks and hive-like slevations, immediately snrrounding ths vents, is, in soms cases, ornamsnted in ths most sxquisite manner hy deposits of the same, in ths form of scolloped embroidery set with pearly tuhercles; in others, the silicions deposits take the most fantastic forms. In soms places the silica is deposited in large qnantitiss, thres or four inches deep, in a gslatinous condition, liks starch paste. Trnnks and hranches of trees immersed in thsss waters are speedily petrified.

We givs an engraving of one of these gaysers, taken from Prof. LeConte's hook. It rspresents the Bes-hive, so-called from ths shape of its mouud. This geyser shoots up a splendid column, two or three feet in diameter, and to the hight hy measuremsnt of 219 feet, and plays 15 minutss each time.

The Woodruff Scientific Expedition.

This expsdition which has hesn before ths pnhlic for over a year in vain attempts to maks it a sucosss, has at last wholly and finally collapsed. The reasons are that thers has heen an almost total want of support and in addition an almost total failure on the part of those who did promise to coms up at ths proper time with thsir suhscriptions. There wers ssveral serious drawhacks to the sxpedition which will satisfactorily acconnt for the want of patronage. First, the expense. The fare for the round trip was fixed at $2,500. This, in itself, was snough to har the larger class of peopls, and left the sxpedition to hs patronized almost wholly hy the sons of the very rich. Second, the practical light in which the cost of such an expedition would compare, with the same amount of monsy expsnded on education at home. The facts hear out the assumption that the average person of means, who alone could afford such expsnditure, is not hlind to ths fact that plsasure and work, sight-seeing and study, are not wholly compatible with each other, and that he hssitatss at the possible dangsr of sending his sons so far away, exposing them to ths dangers of the ocean, and rsmoving them from all restraining influencs except the untried discipline of a floating faculty. The expedition has already cost no little time and money and its projeetors will undoubtedly lose heavily.

Fine Gold.—Mr. Louis Blanding, during a recent mining trip to Tuolumne county, had his attention called to the exceptionally high fineness and value per ounce of the gold from the "San Guisseppi" quartz mine, near the town of Sonora. He tells ua that in his experisnce of 20 years he has never known or heard of quartz gold going to 978 fine, equal to $20.24 per ounce. This result was given hy a lot worked in his own mill, and it is sufficiently interesting from its rarity to make a note of.

The Sutro Tunnel—What we May Expect from It.

That tho Sutro tunnel will hs of great advantage to ths Comstock mines, as a msans of fresing them more readily of water, cannot he disputed. That ths orss from thess mines will ever bs brought out through this adit, is not, however, quite so clear. The length of this tunnsl, from its entrance to its point of intersection with ths Comstock lods, is four miles. From the lattsr poiut to ths different mines along ths lode, ths distance is, of courss, variable, hut will average (say) one mile, making ths total distance from the mines to the mouth of ths tuunel five miles, to be traversed hy cars. If large quantities of ore are hereafter found in thess mines it will lie below the level of the Sutro tunnel, necessitating the use of hoisting works to lift it to that level. Works having sufficient capacity to perform this ssrvice have alrsady heen supplied to many of these mines, and through the employment of which great quantities of ore can be cheaply and quickly hrought to ths surface. With these apphances already on hand, or easily provided, it is hardly to he supposed that the ores will he loaded into cars and forced to make a journey of fivs miles to a point of exit. This would bs attended with too much delay, if not also with increased cost. And so also in the matter of taking the workmen in and out of the mines. To pass them through the tunnel would he wholly impracticahle. They will have to he lifted and lowered, as at preseut, hy steam. The Sutro tunnel will he of great henefit to these mines in the way poiuted out. It will also, in some slight degree, help promote their ventilation; hut it is not worth while to claim for it more than it can accomplish—of this we have had enough already.

THE BEE-HIVE GEYSER.

Parties from San Francisco are looking at the hlack-sand gold diggings at Gray's Harhor. These have been prospected and not found to pay in the past.

The Freaks of Commerce.

The cargo of the ship *Three Brothers*, lately dispatched from New York for this port, consisted in part of a tolerahly heavy invoice of lye, soda, saleratus and hrimstone, so ths telsgraph informs us. Now, if thers are any mincrals of which we have hers on this coast a supsrahundance—have in unnecessarily and disgustingly largs quantity, so to spsak, thsy consist of these same stuffs so ahout to be imported on ths good ship *Three Brothers*. Talk of carrying coal to Nswcastle! There is commercial sense in that compared with shipping the ahove commodities to San Francisco. Ons would think soda might as well hs sent to the Dead Ssa and sulphur to the hottomless pit as to hs shipped out here. We have in Nevada, and not far from the railroad, sulphur enough to supply evsry modern demand. As for ths alkaline salts, we have deposits over thsrs that havs never heen measured, simply hecause their extent is immeasurahle. There are a good many thousand acres of them, anyhow! But this is liks our economy! There is, howcver, one redeeming feature in the case of thess sulphur and soda importations: they were not originally products of this country, sent away, and having made half the circuit of the glohs, coming hack, after the manner of quicksilver, which metal we have latcly heen in the habit of freightiug over to China, selling it there, then buying it up, rcshipping it to this port and here supplying it to the local trade at satisfactory figures—all of which eccentricities are mysteries to the unmercantile mind.

The great Ford-Holden mining suit, involving several million dollars, and which has cost the parties to the suit $65,000, has heen aettled, and all claims against the old Telegraph mine have heen released.

A lottery is to he organized in France to raise a fund for the completion of the Statue of Liherty presented to the United States.

The Quartz Mines of California and the Blue Ridge Belt.

In rsply to a lstter from the East inquiring whether the Providence mine nsar Nsvada City, in this Stats, is hsing worked helow watsr line and if the sulphurets can he profitahly treated, ths *Transcript* answers in the affirmative, rsmarking at soms lsngth upon the comparative msrits of the California quartz mines and those situated on the Blue Ridge gold hclt, reaching from Virginia to Georgia. In addition to what that journal has said in this connsction it would have heen pertinent to show how insignificant the product of this Blus Ridge helt appears heside that made hy the qnartz mines of California. Among the Atlantic States that have yieldsd gold enough to make a record are Virginia, Gsorgia, ths Carolinas, Tennessee and Alahama. The business in that region was hsgun over 70 years ago, and has heen prosecuted steadily ever since, in some localities on quits an extended and in others on a more limitsd scals. Ths total value of the gold produced in these States to date, as returned to the mint, amounts to about $32,000,000. As this reprssents fully 90% of ths entire production mads, the latter may hs set down at $35,000,000, hsing at the average rate of $500,000 per year since the husiness of gold gathering was first commsnced thers. As we have in this State single mines that yield annually a much larger sum, this Blue Ridge country makes, in the ahove, hut a sorry showing compared with the aggregats ontput of California.

What ths *Transcript* says in regard to the greater tractahility and valus of our ores is much to ths purposs. The fres milling ores from the Providence and othsr mines on that lode havs averaged $27.50 per ton, exclusive of the sulphurets, of which there ars two grades, class No. 1 containing ovsr $100 to ths ton, and class No. 2 containing from $25 to $30 per ton. Thsse orss carry, in various proportions, lead, iron, antimony, arsenic and sulphur, with a littls zinc and copper. That they can he worked with profit is evidsnced hy ths fact that they carry such a large amount of free gold, nor have ths sulphurets heen found especially hard to treat.

Of the hundreds of mines that have in times past hesn opened along the Blus Ridgs helt, not more than five are said to havs yielded any profit hslow ths water line, on account of the extremely rsfractory character of their ores, which contain zinc, carhonates, oxides and sulphursts of copper, with arssnic, antimony, iron and sulphur, and possss the had characteristics of growing more rehellious with dspth. Thsy have, in fact, shown themselves so unmanagesbls that only in a few oases have they hesn worked successfully. Then, too, they occur, as a general thing, only in nests, small and uncertain, while they ars quite uniformly of very low grads, containing on an averags hardly mors than one-fourth as much gold as our California ores. Surely thoss having capital to emhark in this hranch of mining had hetter seek California as a hsld for investmsnt, than to venture their monsy in a quarter so difficult and hazardous as this Blus Belt region.

Producing Mines on the Comstock.—The product of hullion made hy the Comstock mines during the first quarter of ths current year amounts to $2,372,230, as against $10,358,900 during a corresponding period in 1878, and $7,549,500 in 1877. This is a startling falling off and is made the mors impressivs hy the fact that the ores taken out have meantime heen growing steadily poorer. Of the hullion taken out this year, nearly two hundred thousand dollars has come from the tailings worked over, and which have also heen tending constantly to a lower grade. The only mines on the Comstock range from which ore is now heing taken in any quantity are the California, Consolidated Virginia, the Ophir and the Sierra Nevada, the Trojan, Justice, Con. Imperial and Chollar yielding small quantities in an irregular way.

Promising diggings have heen discovered on Dutch creek, Nev.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

On the Great Continental Divide.

The Wilderness at the Head of the Missouri, Columbia and the Colorado Rivers.

[Written for the PRESS by CHARLES F. BLACKBURN.]

Having spent the greater portion of the past two years prospecting in the country lying about the head waters of the Yellowstone and the other great rivers that have their sources in the Wind River mountains, I send herewith for publication in the PRESS some hastily prepared remarks on the region so traversed and explored, and some portions which had probably not before been passed over by any white man. Though mainly in search of metalliferous deposits, I found much in the other natural products of that vast wilderness as well as in its geology, scenery and other physical features, calculated to interest both the practical and the scientific mind.

The Big Horn Mountains—Geology and Topography.

Touching the geology of the country in the vicinity of the Big Horn mountains, it may be observed that the usual calcareous and arenaceous rocks are here found, varying in geological ages from the azoic to the tertiary deposits. Many of these strata are highly fossiliferous, including a great variety of fossils of aquatic origin. No fossil fauna was seen near the base of the range, but east of the mountains in the lignitic tertiary beds, the remains of petrified mammals were noticed. The stratum of the carboniferous age occurs on both sides of the range near its base, both anthracite and bituminous coal being found in abundance. Mountain limestone or the sub-carboniferous strata envelops the mountains to an elevation of 2,000 feet above the base, where they break down abruptly to the azoic rocks, thus the crystalline rocks appear at an altitude of 9,000 feet above the ocean, and compose the more elevated parts of the range. Near the summit a compact, fine-grained grayish granite predominates, which is occasionally varied by belts of gneiss and patches of mica schist. At the south end of the range at its junction with the Rattlesnake range, mica and talcose slate are found traversing the granitic rocks. But little quartz occurs on the western slope, either *in situ* or as float. The eastern slope, however, shows considerable quartz in well-defined ledges, usually of a gray color and often ferruginous. Some of these lodes proved to be auriferous, but the gold was in such small quantities generally as to not defray expenses of mining. The highest elevations in the Big Horn range are Cloud peak and Hayes peak, which reach an altitude of 13,500 feet. Several other peaks reach an altitude above 13,000 feet. The length of the crystalline rocks, of this range is 200 miles, their greatest width which is at Cloud peak, being 25 miles. The range is severed at the north end by the grand canyon of the Big Horn river, which presents a scene of rugged grandeur, with its walls standing vertically fully 3,000 feet high. The length of this canyon is nearly 40 miles, and for sublimity and picturesqueness of scenery, it rivals that of the famous grand canyon of the Yellowstone, in the National park. In the Big Horn mountains colors of gold can be obtained from nearly all the streams, especially from an allnvial deposit of quartz wash around the foothills. This deposit shows infinite attrition, and is evidently not indigenous to the crystalline rocks of the Big Horn range. This foreign deposit in all cases proved to be auriferous, which is not always the case with the original deposits from the crystalline rocks of this range. Taking these facts into consideration I arrive at the conclusion that the gold found about the Big Horn is not all from that range, but that most of it is derived from this ancient wash, which I subsequently traced to the head of Wind river through Union pass and down the Snake. The idea was generally entertained by our prospecting miners that the fine colors of gold found around the base of the Big Horn range came originally from some auriferous belt in those mountains. We are now in possession of geological evidence, however, that disproves this theory. Gold in small or even paying quantities may yet be found in these mountains, but extensive deposits can hardly exist there without showing some indications of its entity.

Metal Deposits of the Snowy Mountains.

In the Snow mountains, between Clark's fork and the Yellowstone, indications are more favorable for both gold and silver. The original rocks here are as follows: Gneiss, granite, syenite, trachyte, porphyry, mica and talco slate; while along the southwest bass volcanic tufas occur. At the head of Soda Butte creek argentiferous galena is found, which yields a fair percentage of silver. Some of these deposits are being developed by Judge Annis and others. Auriferous ores are found *in situ* on Emigrant and Bear gulches, also fair indications on Hell-Roaring creek. On the northern slope extensive deposits of native copper occur near some trap dikes. Below the canyon of Clark's fork some interesting fossiliferous deposits exist in the calcarious sedimentary rocks. The strata here upturned vertically presents to view the organic remains of past ages in such bold relief, as should make this an entertaining field for the geological scientist. Both vertebrate and invertebrate remains were noticed here at various points. Several peaks in this Snowy range reach an altitude of 13,500 feet. Conspicious among these, towers the Russian Crown, with its snowy crest bearing incipient glaciers, and veiled in the shroud of perpetual congelation; a fit home for the ice king.

Sierra Shoshone Mountains.

The Sierra Shoshone range begins at the head of Soda Butte creek and extends south to the head of Wind river, a distance of about 150 miles. Pretty thorough observations and prospecting were made here. The geological formation consists principally of volcanic rocks, basaltic and doleritic lavas, andesite and lava tufas, or a kind of volcanic conglomerate. On the South fork of Stinking Water a belt of gneissoid granite exists, containing many ledges of base ores, but no metalliferous deposits of value. At the mouth of the lower canyon near an offensive smelling sulphur spring (from which the name Stinking Water originated) I found as much as 25 cents to the pan on bedrock, but only in very limited quantity: origin evidently in the lower canyon range from quartzose, granitic rocks or silicious granite.

At the head of the Middle fork of Clark's fork some cuperiferous ores were obtained *in situ* near an extinct volcano. The deposits are argentiferous, and seemed inextensive. On the North fork of Stinking Water colors of gold can be found: origin either from the trap rocks or the crystalline rocks, prior to the great trap eruption which has intruded on or capped the primitive rocks. Petrified wood was also found on this stream containing grains of iron (sideroferite). In this vicinity the mountains present a unique and striking scenery, the geological formation consisting of trap dikes, resulting from a great outflow of lava which has here accumulated in mountain masses. Floods of water have subsequently cut through these with irresistible force, leaving isolated pinnacles and towers standing like great sculptured images. Showers of volcanic sand containing much oxide of iron have covered the tops of the strange objects, which viewed from a neighboring hight look like gigantic columns standing amidst the ruins of a great city.

On the western slope of the Shoshone range volcanic glass is common, this substance being also found extensively in the National park. Standing in this range are several peaks having an elevation above 13,000 feet. Four extinct volcanoes were here discovered, from some of which the sulphurous gases are yet escaping; native sulphur being abundant in their craters. Among the noted elevations of this range are Index and Pilot peaks, and Mt. Langford and the Washakee Needles. The Owl Creek range is a spur of the Shoshone mountains, which, with the Rattlesnake range, connects the Big Horn with the Shoshone mountains. These two spurs are divided by the canyon of Wind river, their summits being only 9,000 feet high. Their trend is east and west, but the rocks are stratified in a northerly and southerly direction. The formation consists principally of metamorphic schistose rocks, quartz being also found in abundance. In panning the alluvial deposits colors of gold were obtained; also garnets, rubies, rutile, crystals of zircon, fragments of itacolumite and other associated minerals found generally with diamond deposits; none of the latter crystals were, however, found, though their existence in this vicinity is not a geological impossibility. Owing to the inclement weather thorough explorations could not be made, but I shall resume operations in this field in the near future.

The Wind River Mountains.

The Wind River group of mountains may properly be termed the American Alps. This region is one of great interest as illustrating the marvelous effects of the dynamical force when used in mountain making. All along the range occur sharp spurs narrowing as they rise till they seem as thin as a knifs blade. Isolated peaks inaccessible to man; deep chasms filled with snow and ice which never melt; alpine hights, awe-inspiring and wearing their glacial crowns in majestic silence; huge blocks of gneiss and granite hills are seen on every hand. The crystalline rocks at the north end of the range are composed principally of granite, gneiss, trachyte, syenite and feldspar, while at the south end the slates appear. Here quite an extensive auriferous belt exists which has afforded fair mining ground for several years. Gold also occurs on the numerous streams of the Wind River drainage. The water at the head of Green river is slightly tinged with a fine powder produced by the moving glaciers crushing the rocks near the summit of the range. No gold was found on this stream in the mountains. The altitude of Union peak is about 13,000 feet.

Green River—An Extensive Hydraulic Gold Field.

Although their elevation is not very great, these Wind River mountains constitute the grand divide of all our great continental rivers. Their southern slope is drained by Green river, while at their western base the Grosventre fork of Snake river gathers a great mass of water to be carried forward and emptied into the Columbia. Their northern slope is drained by Wind river, which, through the Big Horn and the Yellowstone, becomes tributary to the turbid Missouri. The greatest elevation in the Wind River mountains is a peak lying southeast from Union, its hight being a little over 14,000 feet above the ocean level. Several others near this one have an altitude nearly as great. Immense glaciers were discovered here, also perpetual frozen lakes, the ice being still firm in the month of August. Between the Grosventre and Buffalo fork of Snake river auriferous gravel exists, probably in paying quantities. The area of this auriferous tract is 20 miles wide and 40 miles long, and extends as far west as the Teton range. Being evidently an oceanic deposit, this wash shows infinite attrition, even the boulders being polished by long transportation from their original situation—origin unknown, but evidently in the northwest mountain ranges. This wash is of variable depth and is wholly composed of quartz. The nucleus, or the rocks from which this quartz originated, especially that which accompanies the wash, has been reduced to sand by attrition, only the quartz having resisted pulverization. From the prospects obtained here I judge that much of this ground might be profitably worked by the hydraulic process, as water is plentiful, but it would not pay by any other method of handling.

The Snake river drainage has cut many canyons through this wash, the eroded matter having been carried down and deposited along that stream. This is doubtless the origin of the flour gold found on the lower Snake, which has afforded remunerative mining ground for a number of years. This great auriferous debris at the head of the river lies on lime and sandstone rocks. The deposition was made evidently prior to the upheaval of the main divide, as it caps the summit at Union Pass and extends down Wind river quite a distance. But it does not contain gold in such large proportions as the gravels of the Pacific slope. I would not advise miners to go to that country unless they possess sufficient capital to open and operate hydraulic grounds. In the Teton range the crystalline gold-bearing rocks abound, and some auriferous ores were here found *in situ*. Owing to the lateness of the season and the inclement weather, thorough exploration of that district could not be made, but I intend to return to it and determine its value for mining purposes. The Teton is one of the most wild and rugged ranges on this continent. Mt. Hayden and Mt. Moran are the highest elevations there, the former being the keystone of the range. This Alpine peak culminates at an altitude of nearly 13,900 feet, and is visible from nearly all parts of the National park.

Barometrical Observations.

The following altitudes were noted in these several mountain ranges, with observations on vegetation, etc., between latitude 42° and 46° north: The main elevation only is given; the difference in the extremes between the north and south slopes of the mountains exceeding often 1,000 feet. Incipient evergreens, 6,000 feet above the ocean; limits of foliaceous trees, 9,500 feet; gramineous vegetation, 10,000 feet (which is also the limit of evergreen trees); foliaceous shrubbery, 11,000 feet; of evergreen shrubbery, 11,500 feet; limits of alpine flowers and herbaceous vegetation, 12,000 feet; perpetual frozen lakes and incipient glaciers, 13,000 feet; pseudo-meteoric dust or red snow (*palmella rosea* of the English writers) is visible at an altitude of 13,000 feet; glaciers of vast extent exist between 13,000 and 14,000 feet above the ocean, especially in the Wind River mountains. Close attention was given to timber line in this country, and wherever noticed I found trunks of dead trees above those of the living; unmistakable evidence of increasing cold. Another notable feature near timber line on the north slopes of the Wind River range, was that the trees, instead of standing vertically, are found leaning to the southeast, being occasioned by the terrible winds that blow here from the northwest.

Zoology.

The fauna of this country does not differ materially from that of other parts of the Rocky mountains. Buffalo are found in large herds through the Big Horn mountains, but they are being rapidly exterminated by the Indians. Elk and mountain sheep are very plentiful through all the ranges of the Yellowstone country, being generally found near the snow in the summer, where the grass is new and tender. The mountain goat (*Aplocems mountanus*) was not observed in any of the ranges, but has been reported by Indians to exist in the mountains farther north. Only two specimens of the moose were seen. Deer are very plentiful, antelope being generally found around the foothills and on the plains in large herds, also in the National park. No gazelle were found here, but in the Black Hills before populated I shot several of this species of deer, they being numerous on the Belle Fourche river. Bear are very abundant in this region. In the Big Horn range I have seen as many as 20 in one day. They are of four kinds, generally known as the Rocky Mountain grizzly, cinnamon, black and silver tip. Mr. H. R. Wormwood and myself on ascending a peak in the Sierra Shoshone range last July, saw 10 bear at one sight, two of them which we shot. They were feeding on the ubiquitous grasshopper. The snow in these high altitudes is sometimes black with these insects, which get so thoroughly chilled after alighting, that they are unable to fly away. The plaintive bleat of the little coney (*Lagomys princeps*) was heard on all sides, above an altitude of 10,000 feet, and so far as I could ascertain, this rabbit lives at a greater elevation during the winter than any other animal. It was found in the all local ranges near the limits of vegetation. The mountain lion, wolf, coyote, lynx and a great variety of the minor carnivorous genera inhabit this region. The chief fur-bearing animals indigenous here are the black and silver gray fox, otter and beaver. Baird's rabbit (*Lepus Bardii*) is met with in the Big Horn, Shoshone and Snowy mountains. This interesting species was seen in the dense forests of the evergreen zone, about 8,000 or 9,000 feet high. The little chipmunk, as usual, was often around camp inspecting our provisions. The little water ousel we noticed along all the mountain streams, this little bird appearing to have a fondness for rushing torrents, cascades and deep canyons, its twittering songs mingling harmoniously with the musical hut thundering falls of water. Allan's finches (*Leucosticte australis*) were noticed in the Big Horn mountains, near the limits of vegetation. The dusky grouse (*Tetrao obscurus*) is common, although not as numerous as Richardson's grouse. A great variety of aquatic fowls is noticeable in the lake regions of the Yellowstone and Snake rivers, the swan, pelican, gull, crane, loon, goose and many kinds of ducks abounding here, where they remain during incubation in the summer months. The American eagle is very numerous around the Yellowstone lake, also its co-tenant the fish hawk. The Alpine insect fauna of these mountains is similar to that found in the ranges of Colorado; but owing to the paucity of vegetation insects do not thrive here at as great an altitude as they do further south, where lichens and flowers are more abundant. Very little insect life could be found here above timber line. On the the highest peaks no organic life of any description was visible. I really suppose the pole itself presents hardly a more barren and frigid scene of desolation than these glacial peaks. Along the east base of the Big Horn range, we meet with a fine agricultural country, having an average altitude of 6,000 feet. The climate is very healthful, and the country blessed with a cool and bracing atmosphere. The upper tributaries of the Big Horn, Yellowstone, Snake and Green rivers, are unfit for agricultural purposes, owing to their altitude and roughness. Some spots are, however, fit for grazing and stock rearing.

The National Park.

As most of your readers are probably somewhat acquainted with the topography of this spot, I will confine my description thereof to merely a synopsis. This great wonderland lays between the Sierra Shoshone and the Rocky mountains, between latitude 44° and 45° north, its mean altitude being about 8,000 feet above the ocean. It has an area of 2,500 square miles, covering for the most part a very abrupt and broken country, abounding everywhere with impressive views of mountain scenery. The interior, however is very beautiful, being diversified with rolling hills, dense forests of feathery top pines, open glades and park-like views, with now and then a miniature savanna of silvery lakes and rushing streams. The atmosphere is saluhrious and transparent, imparting to the far off peaks a sharp outline and the appearance of close proximity. The greatest collection of natural curiosities of the world has been gathered by nature herself in this National park, lying in Montana and Wyoming Territories.

The Yellowstone lake, a handsome sheet of water, is situated in the southeast corner of the park, at an elevation of 7,788 feet above sea level. Along its southern and eastern shores the mountains present an impressive scene of rugged beauty, being very lofty and abrupt. This lake covers an area of over 200 square miles. Trout are found in great abundance near its outlet, but owing to the juxtaposition of subaqueous geysers they are not edible. Those caught, however, at the head of the lake, where the cold waters come rushing in in the shape of mountain torrents, are good. In the mud volcanoes we see another wonderful freak of nature. Down in these craters the hot mud can be seen thrown in many shapes. After sufficient steam has been generated, a huge mass is thrown several feet in the air, and, falling back into the crater, this action is repeated.

Prominent among the grand views of the Park are the falls of the Yellowstone, which afford a truly magnificent sight. The upper fall is 140 feet high, the grand falls are over 300 feet high, the foaming water rushing over the vertical falls, like a moving stream of snow. The mighty torrent, spanned by a rainbow, descends, with a thundering roar, that can be heard afar off. Below the falls the grand canyon begins, extending thence 20 miles down the river. The walls stand perpendicularly nearly 2,000 feet high. The Mammoth spring, near the northern boundary of the Park, is also a noted place, attracting many visitors by the medicinal properties of its waters. On Specimen mountain some rare curiosities in the way of petrifactions are to be seen, some of them being standing trees, in the cavities of which some brilliant crystallizations are found, fine specimens of banded and clouded agates, opal, chalcedony, carnelian and other rare stones can be picked up *in situ* on this mountain. The National park is destined to become the most famous watering resort of the world. Its mineral waters consist of great diversity, and is infinitesimal and replete. No tourist can ever regret a visit to the great wonderland and for a few weeks consult nature's sanitary domain and witness her grand and unique sceneries.

TAR SPOTS.—Butter will remove tar spots. Soap and water will afterward take out the grease stain.

MECHANICAL PROGRESS.

Krupp's Latest Patent.

The patent for dephosphorating pig iron lately granted to Krupp is hased upon the following: When molten pig iron comes iu contact with basic oxides of iron or mauganeee a reaction takes plaee, in course of which all impurities contained in the iron, as silicium, sulphur, manganese, and especially phosphorue, are separated and converted into slag, the oxygen of the oxides being taken up by the impuritics and their iron being united with the portion treated. By using a mixture of iron and manganese oxides tbe attack of the oxygen npon the carbon of the iron is to some extent prevented and more time afforded for the complete elimination of the impurities mentioned.

The pateuted inveution consists of the use of the reaction described for the purification of pig iron. The latter is, directly from the smelting furnace, conducted into a rotary furnaco lined with a mixture of the oxidee of iron and manganese. In case of neeessity, an additional quantity of these oxides may he added to the metal. The latter ie now for a certain length of time exposed to the action of the oxides. As soon as signs are emitted that the carhon is heing attaeked, the metal is drawn off from the slag formed and may uow at once he worked up into steel or iron, as desired, or cast in ingots for future usc. The fact that a readily flowing iron free from phospborus may be ohiained in this manner is of great importsnce, as quantities as large as five tons may, in tbis case, he operated upon at once. Rotary furnaces of varions construction may he used. The specification nf the patent mentione those of Pernol, Danks, and Godfrey & Howson.

The crude metal is admitted into the rotary furnace, after tho temperature of the latter has been hrought to the melting point of the oxides with which it is lined, and the duration of the operation is from five to fifteen minutes only. The moment at which the oxidee commence to act npon the carhou may be easily determined hy the formation of froth on the eurfaee. The percentage of carbon in the iron is hardly reduced, while in all respects the quality of the iron is greatly improved.—*Deutsche Gewerbe Zeitung.*

A New Locomotive Chimney.

John Baird, chief engineer, and Allan Stirliug, master mechanic, of the Metropolitan Elevated road, have ohtained a patent for improvements in the construction of locomotive chimneys, which they claim will overcome the puffing and roaring incident to the escape of smoke and steam. The devices are an expansion chamher and an annular nozzle placed in the chimney, the effect of which is to prodnee a regular noiseless emission of smoke iustead of an intermittent and sonorous one as at present. The steam from the cylinders instead of passing directly through nozzles is discharged into a chamber of 10 times the capacity of the cylinder, which will allow the steam to expand in volume, and greatly reduce its pressure, so that the noise of puffing will not be heard more than 10 feet away. Mr. Baird claims that this appliance also gives greater speed, with a saving of at least 25% in fuel. He also claims thnt by the application of an English patent the hissing noise of the sndden escape of steam from the brake ejector when trains are approaching a station will be obviated. This improvemcnt consists of a cylindrical chamher with wire gratings at each end, the cylinder being filled with small glass beads, ahout an eighth of an inch in diameter, with a hole in the center. The steam, in passing around and through them, is snb-divided into eo small parts as to utterly destroy its power for producing noise. It requires about 75,000 beads for each cylinder, and the company has already purchased about 800,000 of them. It is estimated that it will reqnire several millions to equip all the locomotives in nse on the road. These novel improvements have been applied to three of the engines, and they will be put on all the engines as eoon as possihle.

Note on Steel Welding.—M. Sergius Kern, M. E., St. Petersbnrg, writes as follows to the *Chemical News:* "In some articles inserted in tbis journal the author statcd that pure steel, nearly free from phosphorus and sulphur and containing from 25% to 30% of carbon, stands easily the process of welding, if, indeed, the work is done with care and by clever workmen. It may he mentioned here that to a steel shipplate, two feet wide and three-eighths of an inch thick, a steel plate (two inchee by two inches by three-eighthe of an inch) was easily welded, and a perfectly clean and good joint was received. In auother caee eteel stripe (eix inchee by four inchee by one-fourth of an inch), containing 25% to 26% of carbon, were welded together; very often after cooling the plate was bent douhle, through the weld, without the least fracture in or near the welded part. In some experimente euch platee were bent at a dark heat, and they often, not alwaye, resisted this severe teet, ae it is known that at this temperature the eteel ie more liable to break. These triale ehow that Ruesian Bessemer steel is of a very good quality."

Barff's New Process for Preserving Iron.

Prof. Barff lately gave a lecture in London on the results nbtained hy his new process since its first announcement, about two years ago, an account of which has already appeared in these colnmns. We clip the following hrief summary of the lecture from the *Scientific American:*

The process consists, in brief, in snbjecting the surface of the iron to the action of superheated steam at a high temperature. The result is the production upon the surface of the iron of a hard, smooth, and durahle skin of black oxide of iron, which preveuts rust far better than any paint, lacquer, rubher, or other compound or procese heretofore known.

Iron articles to he treated by this new process are first cleaned with dilute sulphuric acid, and afterward with bran water. They are then placed within a muffle, the temperature nf which ie 500° or 600° Fah.; dry superheated steam at a temperature of 1,000° Fah. ie admitted, atmospheric air hoing carefully excluded. The formation of the black oxide skin rapidly takes plaeo.

This coating has peculiar properties. It is so hard that it resists emery powder and the file. Many substanceee wbich adhere to ordinary iron will not stick to this prepared iron. For cookery the new process is especially useful. Barff stew pans and other utensils are more cleanly, as arrowroot and other eubstances can he cooked in them and the vessel eleaned with great ease. Barff vessels can he heated red hot without injuring the ekin. Barffed iron is proof against damp, water, hot or cold, aud stands exposure to tbo weather far hetter than galvanized or painted iron. Barffed boiler and ship plates, whether of iron or steel, are superior to all others, as they do not corrode and sediment does not readily adhere. The procese is applicahle to almost every conceivable form of iron manufacture, and appears to be a scientific, important, and valuable contribution to the industrial wants of the world.

The New York Exhibition of 1883.—The committee of citizens having in charge the selection of a site or the locatiou of the World's Fair in 1883, have at last agreed upon a suitable plaee. The committee consists of Jackson S. Schnltz, Orestes Cleveland, Col. Hoe and Messrs. Vanee aud Tiffany. A report is hèing prepared, and will be submitted for publication within a few days. It was resolved at a meeting of the committee that tbe location should not he divulged by any member of the committee previous to the puhlication of the report. It is helieved tbat the site selected is a tract of 170 aeres on Long Island Sound, extending from Port Morris to the Southern Boulevard. The reason of the committee for refusing any information on the subject is their desire to prevent speculators in real estate from taking an unfair ndvantage of the owners of land in the neighhorhood, hy purchase in advanee of the puhlieation of the report.

Usudurian Packing. — The Woonsocket Rubher Company, of New York, are introducing a new steam packing, which they call the Ueudurian Steam Packing, an article made of unvulcanized rubher and other substances. It is a non-conductor, and when subjected to the action of steam it is vulcanized aud cnahled to resist influences which are usually very destructive of ordinery rubher packing. By the application of naphtha to their surfaces, two pieces of the packing may he united and, under pressure, become practicably one, which is a convenience, as the user is thus enahled to huild up any desired thickness of packing.

Railroad Construction in 1878.—The *Railroad Gazette* recently gave a revised and corrected statement of the railway mileage of the United States added during the year 1878, as follows:

Year.	Miles.	Year.	Miles.
1872	7,240	1876	2,450
1873	3,873	1877	2,301
1874	2,025	1878	2,856
1875	1,561		

We have a total of 82,064 miles in the country at the beginning of 1879.

Malleable Cast-Iron.—M. Cordier, of Paris, has taken letters-patent for what is described as an important invention connected with the manufacture of malleable east-iron, "the object of which is to couvert Bassemer metal, and other similar metal, into a special cast metal, particularly applicable for the manufacture of malleable cast-iron. The product is between malleable cast-iron aud ordinary gray pig-iron, and yields an excellent steel by puddling."

Annealing Glass.—A new invention in the process of annealing glass has been patented in France, which consists of first burying the glass when cold in pounded stone, plaster, lime, fire clay, or any eubstance capable of attaining the degree of heat neceesary for the annealing operation, and then raising it to the required temperature. The object of the proces ie to render articlee of glass stronger and more capable of euetaining traneitione of heat and cold.

A number of iron croee-ties have been laid down by the Philadelphia & Reading Railroad Compauy, near the Phœnixville depot, at a point in the road where the traffic is unueually heavy, with the view to their more general introduction, ehould tbey prove to be satisfactory.

SCIENTIFIC PROGRESS.

Photography in Colors.

Many people, latterly, have erroueously given to different eystems of painting on photography the misplaced title "photography in colors." This was too much to say of the ingenious results, some of which were ohtained hy the transparence of the photographic image, some hy other means. Nay, attempts were even made to make us believe that photographic proofs, tinted hy oil or water-colors, were proofs obtained diretly in colors. The only process which, up to the preseut time, has really deserved the name of "photography in colors" is that of M. Ducoe dn Hauron, hut it ie only still in infancy, its practice being very diffieult, and the colors obtained not always heing of the required tone. To arrive at the real colors of natnre is no easy task, but we doubt not that M. Ducos du Hauron will, sooner or later, solve this difficult problem.

M. Germeuil Bonnaud's process of photographing in colors—we use thie term intentionally, becauso it is the only term strictly applicahle—simply consists in causing tho photographic action to operate directly on the color. To this end M. Germeuil Bonnaud has carefully sought the means of rendering a neutral color sensitive, and at the eame time insoluhle, so that it might he able to resist the numerous baths necessary to the photographic process. When this process is used, all the operations remain the same as in the ordinary method, with this great advantage, that the impressions made hy the silver salts on the colored hackground give precisely the effect of the original model, and have not that hardness of tone that generally characterizes a "retouched" photograph. The print comes out of the hath completely colored. Thanks to the chemical agente and the sensitive paper used hy M. Germeuil Bonnaud, the colors and the photograph are henceforward indelihly united. But, in addition to the great artistic results, the material advantages of this discovery are very considerable. Firstly, the true harmony of color is reetored, while prints colored by any of the old processes—photo-painting, as one might call them—are always monotonous and wanting in durability. By oil painting on the photograph, the employment of water-colors, or even of transparent media, the cost of production was immensely increased. And this was not all, hecause to obtain really artistic effects it was necessary to employ artists of such a degree of talent as is rarely found iu country towns, where one does not find every day a Millais, a Dickinson, or a Nadar. Now the photegrapher can do it all himself. So much the hetter for those who are neither painters nor draughtsmen. It appears that the cost of the colored photographs produced by the Germeuil Bonnaud process is very little, if anything, more than the ordinary uncolored ones. So we get at the price of an ordinary carte-de-visite a photograph in nnchangeahle and unfading colors.—*M. K. Versnaeyen, in Scientific American.*

On the Reddening of Carbolic Acid.—Owing to frequent complaints from purchasers and consumers of carholic acid, ahout its aequiring a red color, the firm of Gehe & Co. (of Dresden) have puhlished the following: Many prominent chemists, and all manufacturers of crystallized carbolic acid, have long endeavored to discover the eause of the reddening of pure crystallized white carbolic acid. But in spite of their careful investigations and experiments, the reason still remains unknown. It is inexplicahle why, for instance, a portion of a distillate should remain perfectly white for months, while another portion of the same distillate turns red. Some chemists maintain that this reddening is a characteristic trait of perfectly pure carbolic acid; but thie has not been proven. Whatever may be the cause, it is universally conceded that such colored carbolic acid, provided it has the correct boiling point, is precisely as good as the white, and need not be rejected. The *Phar. Germ.* prescribes that it should melt betwecn 25° and 30° C. (77°—86° F.) but it has generally a high melting point (the *U. S. Ph.* gives the latter between 93° and 106° F.) -No manufacturer can warrant the permanency of the white color of hie carbolic acid.

Constitution of Nebulæ.—In the "Investigations upon the Hight of the Atmosphere and the Constitution of Gasiform Cosmical Bedies," A. Ritter deduces the following law: "If, in consequence of increase or diminution of heat, the radius of the gaseous globe undergoes a change, the temperature of its center also changes; but the product of tbe radius into the central temperature is constant." Since Neptune's orbital radius is about 6,000 times as great as the sun'e present radius, the sun's central temperature is now about 6,000 timee as great ae when, according to the Kant-Laplace hypotheeie, the eun was expanded to the orbit of Neptune. Of the whole work which hae been performed by gravity during that immenee interval, more than four-fifthe ie etill etored within the sun'e mase in the form of heat.

Prof. J. Lawrence Smith finde that the native irone of Greenland are mutually eimilar, and that they differ from the meteoric irone. He thinks it probable that the native iron may have been brought up from below, like the native alloy of platinum and iron.

The Tails of Comets.

Prof. Bredikhine, nf St. Petersburg, writes Mr. Proctor in the Newcastle *Weekly Chronicle*, has made some very interesting researches into the evideuce respecting the tails of comets. He shows reason for believing that these appendages may be divided into three distinct classes, according to the different relatione between the attractive and dispersive power of the sun. The latter power he considers to he, in all probability, modified by the different properties of the particles of wbich the tail is formed. Thcre are few subjects of inquiry more difficult and perplexing than the phenomena of comets' tails. The evidence seems unmistakahly to point in some cases to a true repulsive action excited hy the sun, and yet nothing seems harder to undcrstand thau tho possihility that the sun should exert such a power in so energetic a manner as to produco the atuazingly rapid extensiou of tail matter seen in certain cases. Thus the tail of Newton's comet seen after tho comet had made its nearest approach to the eun, must have heen thrown out in less then a day (probahly in less than a few hours) to a distance of more than ninety millien miles. Under the sun's gravitating power, tromendous though that power appears, the comet, with all the velocity it had already acquired, took more than four weeks in traversing the same distance. Tyndall's ingenious attempt to explain the formation of comets' tails as due to the nctinic encrgy of rays whicb have passed through tho comet'e head, faile to account for the phenomena presented hy many long-tailed comets. Prof. Tait's sea-bird analogy, by which the formation of a comet's tail is compared with the coming into view of a flock of sea-birds, as the plane of their array comee to coincide with the observer's eye, would never have been advanced hy anyone familiar with the hietory of the most important comets, or even with the bistory of any one of the great comets which have heen visihle for more than a few days. What Sir John Herschel wrote more than forty years ago has never yet been invalidated, viz., that the phenomena of comets can only he explained by assuming the existence of an intense repulsive force, excited hy the sun on the thin material raised hy his heat from the surface of comets approaching him from interstellar space.

Solidified Hydrogen.

By the success which has heen obtained in liquefying the gases thus far supposed to he permanent, it appears certain that not only liquefaction, but also solidification has heen achieved.

Pictet, in a very recent experiment with hydrogen compressed at 650 atmospheres, found, on opening the stop-cock, that the gas issued with a noise like that of a hot iron har under water, and it had a eteel-blue color. The jet suddenly became intermittent, and then there followed a sort of hail of the solid particles of hydrogen, which fell with violence on the ground, and produced a crackling noise. Afterward the stop-cock was closed, and there was evidence that a cryetallization of hydrogen took place within the tuhe; hnt when the temperature was again raised, the gae issued as a liquid.

M. Dumas, the President of the French Academy of Sciences, accepts these facts as full of confirmation of the theory long ago advanced that hydrogen is a gaseous metal. As water is an oxide of hydrogen, it follows from this that when a person drinks a glass of water, he imbihes a metallic oxide. *Nature*, in mentioning these performances, coupled with them another, which it regards as yet more remarkable from a scientific point of view. M. Pictet has been able to measure, with a very close approach to accuracy, the volume occupied by a given weight of oxygen in the liquid state. By means of two Nicol prisms, M. Pictet observed the jet of liquid oxygen in polarized light, and found etrong evidence of the presence of solid particles.

As in the chemical nomenclature, the final ending "um" has been adopted for all metals, it is proper to call this metallic hydrogen, "hydrium," a name which has already been used even before hydrogen had been used or liquefied or solidified.

Pteratomus Putnamii, or "Putnam's winged atom," is the very appropriate name given by Prof. Packard to a creature first described by him, and which is probably the emallest of all known insects. An individual of this speciee was captured last summer by Mr. J. D. Cox, who gives a full description of it in the *American Naturalist.*" Its body ie twelve thousandths of an inch in length, the antennæ twenty thousandths. It is probahly an egg-parasite of the leaf-cutter bee.

Telegraphing to Running Trains.—C. M. Gariel deecribee the euccessful working of Baillehache'e invention for eignaling to and from trains in motion, on a part of the line which connects the Champs de Mare with the etation at Grenelle. The experimente were eo euccesseful that they are likely eoon to be repeated on a much larger scale.—*La Nature.*

Another Asteroid Discovered.—C. H. F. Petere, of Hamilton College, Clinton, N. Y., discovered another new aeteroid on the 21et of March. The planet is bright, and of the eleventh magnitude.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Apr. 24.		Week Ending May. 1.		Week Ending May 8.		Week Ending May 15.	
Alpha	19¾	18¾	20	19	19	17	17	14
Alta	5¾	4¾	6¾	5¾	6½	5	6¾	5¾
Andes	45c	35c	45c	35c	40c	25c	25c	20c
Alps	....	....	....	....	....	....	....	....
Argenta	1.60	1.60	1¾	1.40	1¾	1.20	1¼	1.10
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	15c	....	25c	15c	....	....	....	....
Baltimore Con	....	....	....	....	1	80c	....	....
Belcher	5⅜	5⅜	7	5⅜	6½	4½	5½	3¾
Belmont	10c	....	25c	20c	40c	....	40c	30c
Best & Belcher	16	15½	16⅞	16¼	17	14½	14½	12¼
Bullion	5¼	4.80	5⅞	5¼	5¼	4½	4.30	3½
Bechtel	1¼	90c	1⅛	95c	1.10	90c	1	60c
Belle Isle	45c	....	40c	35c	35c	....	40c	30c
Bodie	9¾	8	9½	8⅝	9¾	9¼	9¾	9¼
Benton	3¾	2.20	4¾	4.15	4.35	3½	4.40	3.40
Bulwer	22	20	22	18¼	12½	11⅞	12	10¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.85	2.05	2.80	2	2.15	2	1.90	1¼
Belvidere	1.70	1.40	1.40	1.20	1.10	75c	75c	55c
Booker	55c	45c	55c	35c	50c	45c	30c	20c
Caledonia	1.90	1¾	2	1.85	1.95	1¼	2	1.20
California	6¾	6⅝	7	6⅞	7¼	6⅞	7½	6⅞
Challenge	2.85	2.80	3.10	2¾	2¾	2¼	2¾	2
Chollar	6	5¾	6½	5⅞	6¼	6	5⅞	4.70
Confidence	13¾	13	14¼	13½	15	11	12⅜	9
Con Imperial	1.45	1.35	1½	1.40	1.40	1.20	1½	1.05
Con Virginia	6½	5¾	6¾	6⅝	7⅜	6⅜	7¼	6¾
Crown Point	4.95	4¾	5⅝	4.90	5½	3.95	4.40	3.60
Con Washoe	....	....	....	....	....	....	....	....
Champion	25c	....	30c	10c	20c	10c	15c	10c
Concordia	20c	....	20c	....	....	....	10c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	10c	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	60c	45c	60c	40c	50c	40c	55c	40c
Eureka Con	15	14	16	14½	18	17½	16⅞	16
Exchequer	5⅝	4.80	5½	5⅜	5½	4.95	4¾	3.65
Endowment	25c	....	....	....	....	....	20c	15c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.60	3.05	3½	3½	3.45	3.30	3½	3.20
Gila	35c	25c	35c	30c	10c	....	10c	....
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	9½	9	9	....	13½	10	14	13
Goodshaw	45c	40c	30c	....	25c	....	25c	....
Gould & Curry	8½	8¼	9¼	8⅜	9¾	7⅞	8¼	6¼
Hale & Norcross	11½	11	12½	11¼	12⅝	10¼	12½	10
Hillside	2	....	2¾	2.40	2½	2.15	2.15	1¾
Highbridge	35c	25c	35c	10c	30c	25c	85c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	20c	15c	15c	....	20c	....
Independence	3¼	2½	3	2.90	2¾	2½	3.10	2.80
Julia	3.90	3.55	4	3.60	3.90	3	3.40	3½
Justice	3.90	3.60	4.15	3.70	3.80	3	3½	2½
Jackson	....	....	6⅛	6	6½	6½	6	....
Joe Soates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4¾	4½	4¾	4.65	4.60	4	4	3.60
Kossuth	10c	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	95c	50c	95c	70c	70c	50c	55c	40c
Lady Wash	1	....	1½	1.15	1.20	1	1.35	1
Leopard	1.70	1½	1.60	1½	1½	1¼	1.40	1.15
Leviathan	60c	45c	65c	55c	75c	60c	60c	50c
Leeds	50c	....	75c	60c	75c	70c	70c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.60	2½	2½	2.40	2.55	2½	2½	2
Martin White	....	....	6	5¾	6	6¾	7	6⅜
McClinton	1.05	90c	1	85c	1	90c	60c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	34	31¾	37½	34½	37½	31	32	27
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	10	7¾	11½	10	11⅜	9	10	7½
New York	65c	55c	75c	65c	70c	55c	60c	40c
Northern Belle	8¼	7¼	7	6½	7½	7	7⅛	6¾
New Coso	....	....	....	....	....	....	....	....
Navajo	....	....	20c	15c	20c	....	20c	10c
Occidental	....	....	....	....	....	....	75c	....
Ophir	27	25	37	27	38½	31½	36½	31½
Oriental	40c	....	50c	....	....	....	50c	....
Overman	9¾	8⅛	10½	9¾	9¾	7	8	6½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	45c	4c	45c	40c	45c	40c	45c	40c
Potosi	3.85	3.70	4	3¾	3.90	3.30	3½	2
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5	3.70	4	3½	3¼	3	3	2.60
Richer	90c	70c	70c	....	55c	....	30c	25c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	10	9⅝	11	9⅜	11½	9⅜	11⅜	8¾
Seg Belcher	....	....	28½	25	25	....	23	22
Sierra Nevada	47	42½	62¾	47	52½	42½	45	40
Silver Hill	1.30	1.15	1½	1¼	1.30	1⅛	2	1.30
Silver King	8	....	6¾	8	8	....	8	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	50c	25c	35c	25c	40c	30c	50c	20c
Summit	2.30	2	2.10	2	2	1¾	2	1
Scorpion	2¾	1.60	2¼	2.10	2.30	1.95	2.55	2
Solid Silver	30c	....	30c	25c	25c	20c	25c	....
South Bodie	45c	40c	40c	35c	50c	35c	40c	35c
South Standard	20c	15c	20c	....	15c	....	....	....
Star	40c	....	50c	40c	50c	....	45c	40c
St. Louis	....	....	30c	....	....	....	....	....
Syndicate	2	....	2	....	2¼	2	2¾	2.55
Tioga Con	1.80	1.70	2.70	2	2.30	1.90	2.35	2.10
Tiptop	75c	60c	75c	60c	80c	75c	80c	75c
Trojan	10c	....	10c	5c	5c	....	25c	5c
Union Con	69½	58	75	69½	74½	64½	69	53
Utah	14¾	13½	16¾	14½	16	13	13¼	11½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.15	1.05	1.15	1	1.15	85c	1.15	50c
Wells Fargo	10c	5c	10c	5c	10c	5c	....	....
Woodville	15c	....	30c	20c	25c	....	20c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16	15	18	16⅜	16⅞	13½	14¼	13

Sales at S. F. Stock Exchange.

Friday A. M., May 9.
880 Alta....5½
50 Alpha....17
500 Andes....20@25c
655 Belcher....4¾@4.70
350 Bullion....4
95 Best & Belcher...14½@14⅝
260 Benton....3.60@3¾
30 Challenge....2¾
580 Caledonia....1.20@1⅛
69 Confidence....11½@11¾
1450 Con Imperial....1.20@1¼
340 Crown Point....4@4.10
2155 Con Virginia....7½
545 Chollar....5¼@5½
1630 California....7½@7
705 Exchequer....4½@4.35
150 Flowery....55c
965 Gould & Curry....8½@7⅞
195 Hale & Nor....11@10⅝
35 Julia....3.40
225 Justice....3½@3⅜
100 Lady Bryan....55c
200 Leviathan....55@60c
150 Lady Wash....1
1940 Mexican....30@28¾
300 Margarita....15c
50 Mt View....6½
100 Mackey....1¼
1005 N Bonanza....1@1.15
235 North Con Vir....9¾@9½
2690 Ophir....32@34
375 Overman....8@7¾
250 Phil Sheridan....40@45c
535 Potosi....3½@2.90
430 Savage....9⅞@10
1050 Silver Hill....1⅝@1.40
425 Sierra Nevada....45@44
390 Scorpion....2@2¼
200 Trojan....5c
365 Union Con....67½@65½
1270 Ward....60@75c
420 Yellow Jacket....14@13⅝
AFTERNOON SESSION.
420 Argenta....1.15
350 Albion....40@35c
235 Bulwer....12@11
25 Black Hawk....1.90
350 Belvidere....60@55c
50 Booker....20c
50 Belle Isle....30c
320 Bodie....9½@9⅝
1445 Bechtel....90c@1
550 Champion....10@15c
525 C Pacific....2.60@2½
1150 Caledonia (B H)....3@4
240 Dudley....30@35c
190 Day....40c
10 Eureka Con....16⅞
240 Grand Prize....3.40@3¾
400 Golden Terra....14@13
200 Highbridge....85c
25 Hillside....2.15
1190 Independence....3@3.10
560 Jackson....6
400 Jupiter....45@50c
50 Leopard....1.15
140 McClinton....80c
585 Mono....3½@3.40
50 M White....7
375 Navajo....15c
95 Northern Belle....7½
325 Noonday....1.90@1¾
140 Raymond & Ely....3
200 Richer....25c
40 Red Cloud....35c
100 Syndicate....2¾
330 S Bulwer....50@55c
200 Star....45c
100 S Bodie....35c
420 Summit....1½@1
45 Silver King....8
400 Tuscarora....10c
295 Tioga Con....2½@2.35
200 Tiptop....75@80c
250 University....40c

Saturday A. M., May 10.
50 Alpha....15⅝
875 Alta....5½
800 Argenta....1.10
1050 Albion....40@50c
65 Bulwer....11½@11½
100 Booker....30c
270 Bodie....9½
220 Best & Belcher...13½@13
1055 Belcher....4½@4½
740 Bullion....4@3.65
310 Benton....3½@3.60
250 Belle Isle....35c
825 Bechtel....70@80c
100 Black Hawk....1⅞
300 Belvidere....65@60c
330 Chollar....5
555 Crown Point....4@4.05
1295 Con Imperial....1.15
855 California....7
1555 Con Virginia....7@7½
225 Confidence....10½
745 Caledonia....1¼@1.20
340 Challenge....2¼@2.30
150 Con Dorado....1.80
730 Caledonia (B H)....4@3¾
20 C Pacific....2½
400 Day....45@40c
30 Dudley....40c
245 Exchequer....4.15@4
220 Eureka Con....16½@16¼
300 Flowery....50c
100 Fourth July....40c
50 Giant & O A....5
800 Gould & Curry....7¾@7½
435 Grand Prize...3.45@3.20
50 Golden Terra....13
985 H & Norcross....10¾@10⅝
200 Hussey....20c
550 Hillside....2
350 Hamburg....50c
900 Highbridge....30@25c
865 Independence....3@3.05
50 Jupiter....40c
505 Julia....@33.05
225 Justice....3@3.10
910 L Bryan....55@50c
300 Leviathan....55@50c
1940 Leopard....1.40@1½
495 Mexican....29@29½
70 Manhattan....2.10
100 Mackey....1.30@1¼
20 M White....6⅜
100 McClinton....70c
110 Mono....3.35
100 New York....40c
135 N Con Virginia....8¾@9
340 N Bonanza....1.15@1
300 Northern Belle....7½@7
450 Noonday....2.10@2
1075 Ophir....32@33
395 Overman....7½@7½
280 Potosi....2¾@2.90
110 Raymond & E....3
100 Richer....30c
120 South Bodie....35c
350 Summit....1¼
50 Syndicate....2¾
200 S Bulwer....40@35c
445 Sierra Nevada....42@41½
100 Succor....20c
455 Silver Hill....1.30
470 Savage....8¾@9¼
265 Scorpion....2.10@2
300 Star....45c
50 Solid Silver....25c
300 Tuscarora....10c
140 Tiptop....75@80c
300 Tioga....2½
45 Utah....12½@12¾
220 Union Con....58@59½
60 University....30c
200 Woodville....20c
1010 Ward....75@65c
520 Yellow Jacket....13½@13

Monday A. M., May 12.
140 Alpha....15@14
1750 Alta....5½@5⅝
690 Bullion....3¾@3½
955 Belcher....3¾@4
210 Best & Belcher..12½@12¼
310 Benton....3.40@3½
260 C Dorado....1.90
110 Confidence....9½@9
1495 Con Virginia....7½@7¼
2080 Con Imperial..1.10@1.05
500 Chollar....4.80@4.70
450 Challenge....2
405 California....6¾@7
735 Crown Point...3.80@3.65
260 Caledonia....1.65
245 Exchequer....3.65@3.85
890 Gould & Curry....7@6⅞
725 Hale & Nor....10@10½
690 Julia....2¾@2½
280 Justice....2.65@2½
50 Kentuck....3.60
550 Lady Bryan....50c
50 Leviathan....55c
200 Lady Wash....1
880 Mexican....28@27
50 Mackey....2.10
660 N Bonanza....1
460 North Con Vir....7½@8
125 New York....40c
340 Ophir....32@31½
125 Overman....6⅞@6½
510 Potosi....2
230 Savage....8½@8⅜
365 Sierra Nevada....40@40½
50 Scorpion....2
245 Silver Hill....1.30@1.35
70 Utah....11½@11¾
320 Union Con....56@53
400 Wells-Fargo....6c
585 Ward....60@50c
565 Yellow Jacket....12½@12
AFTERNOON SESSION.
2300 Argenta....1.15@1¼
700 Albion....40c
1650 Belle Isle....40c
175 Bodie....9⅜
200 Booker....25c
550 Bechtel....60@70c
635 Black Hawk....1.40@1½
320 Bulwer....11@10¾
70 Belvidere....70c
150 Champion....10c
500 Concordia....10c
150 C Pacific....2¾@2.40
650 Caledonia (B H)....3
750 Day....40@45c
355 Eureka Con....16½@16
500 Gila....10c
130 Grand Prize....3.30
250 Goodshaw....25c
85 Giant & O A....5
150 Highbridge....30c
380 Hillside....1.95@2
800 Independence .2.90@2.80
100 Jackson....6
600 Jupiter....50c
200 Leopard....1.40
190 Manhattan....2
100 McClinton....60c
280 Mono....3¼@3.30
435 Northern Belle....7@6⅞
135 Navajo....10@15c
900 Noonday....2
60 Raymond & Ely....3
850 Real del Monte...3@2.30
150 Red Cloud....35@30c
400 Star....45c
100 S Bodie....35c
250 Summit....1.40@1½
250 Syndicate....2.55
80 Silver King....8
10 S Bulwer....30c
1650 Tuscarora....15c
720 Tioga Con....2.10@2.15
150 Tipton....75c
1300 Vortex....50@60c

Tuesday A. M., May 13.
570 Alta....5⅞@6¼
240 Alpha....15@15½
395 Andes....25@20c
895 Belcher....4¼@4½
360 Bullion....3½@3.85
215 Best & Belcher....13@13¼
695 Benton....4@3.90
300 California....6¾
100 Confidence....10¾@10⅞
100 Challenge....2¼@2½
880 Caledonia....1.90@1.80
340 Con Imperial..1.20@1.15
510 Crown Point....3.95
1197 Con Virginia....7½@7¼
250 Chollar....4.90@4.85
350 Con Dorado....2¼
375 Exchequer....4½@4.70
250 Flowery....60c
335 Gould & Curry....7½@7⅝
60 H & Norcross....10¾@10⅝
350 Julia....2.60
160 Justice....2.95@3
215 Kentuck....3.65@3½
790 L Bryan....45c
50 Lady Wash....1.20
150 Leviathan....55@50c
250 Mexican....27¾@28¼
110 Mackey....1
50 Mt View....6
350 N Bonanza....1.05
215 New York....40@50c
315 North Con Vir....9½@9¼
755 Ophir....32½@33
100 Overman....7¼
200 Potosi....2¾
150 Phil Sheridan....40c
450 Savage....9½@9⅜
20 Seg Belcher....22
100 Succor....25c
325 Sierra Nevada....42½
5 Solid Silver....35c
450 Scorpion....2@2.15
635 Silver Hill....1½@1.60
350 Trojan....15c
55 Utah....12½@12¾
250 Union Con....60@62
50 Woodville....10c
1200 Wells-Fargo....5c
1050 Ward....90c@1.15
440 Yellow Jacket...13½@13⅞
AFTERNOON SESSION.
2780 Argenta....1.15@1¼
950 Albion....40@35c
200 Belmont....30@40c
250 Belle Isle....40c
170 Bodie....9¼
100 Belvidere....75c
1170 Bechtel....65@75c
270 Bulwer....10¾@10¼
525 Booker....25c
440 Black Hawk....1.30@1¼
100 Champion....10c
450 C Pacific....2½
250 Caledonia (B H)....3
375 Day....50@55c
230 Dudley....55@50c
30 Eureka Con....16¼
350 Endowment....20c
1000 Fourth July....40c
100 Giant & O A....5¼
20 Golden Terra....13½
125 Hillside....1.90@1⅞
500 Hussey....20c
600 Highbridge....30c
400 Independence..2.90@2.85
20 Jackson....6
300 Jupiter....40c
640 Leopard....1.40@1.35
50 Leeds....70c
100 Manhattan....2.10@2.05
60 McClintou....65@60c
110 Mono....3¼@3.20
10 Northern Belle....6⅞
100 Navajo....15c
595 Noonday....2¼@2.30
50 Paradise....1.30
55 Raymond & Ely...2.60@3
25 Real del Monte....2½
175 Red Cloud....35@30c
100 Star....40c
100 Syndicate....2¾
495 Summit....1½@1¾
300 S Bulwer....50@60c
400 Tuscarora....10@15c
570 Tioga....2.15@2¼
100 Tiptop....75c
2100 Vortex....60c

Wed'sday A. M., May 14.
250 Alpha....16
450 Alta....6¾@6⅝
200 Andes....20c
285 Belcher....4¾@4.70
700 Bullion....4¼@4.30
300 B & Belcher....13⅞@14
590 Benton....4.30@4.40
1250 Con Dorado....2¼@2.30
275 California....6¾@7
230 Confidence....11¾@11⅜
1710 Con Imperial..1.20@1.15
515 Crown Point...4.15@4.20
1995 Con Virginia....7½@7¼
510 Chollar....5⅞@5½
290 Caledonia....1.90@2
350 Exchequer....4¾@4.70
190 Flowery....65c
395 Gould & Curry....7⅞@8
735 Hale & Nor....12½@11⅞
390 Justice....3¼@3.10
295 Julia....3¼
280 Kentuck....3¾
650 Lady Bryan....45@40c
350 Leviathan....55c
430 Lady Wash....1.30@1¼
565 Mexican....30¾@31½
100 Mackey....1
50 Mount View....6½
70 N Bonanza....1.15@1.10
140 North Con Vir....10
680 New York....60@55c
200 Occidental....75c
370 Overman....7⅞@8
70 Ophir....35½@35
100 Peytona....1
250 Phil Sheridan....45c
920 Potosi....2.90@3.10
725 Savage....10⅞@11⅜
1060 Scorpion....2¼@2.40
1360 Silver Hill....2@1.85
185 Seg Belcher....23
90 Succor....25c
405 S Nevada....44
405 Union....65@66½
80 Utah....12¾@13
270 Ward....1
370 Yellow Jacket....14
AFTERNOON SESSION.
900 Argenta....1.20@@1.15
740 Albion....35@25c
200 Belmont....35c
85 Bodie....9⅞
100 Belle Isle....40c
900 Bechtel....75@80c
630 Belvidere....70@75c
115 Bulwer....11
320 Booker....30@25c
300 Black Hawk...1.40@1.30
250 Champion....10c
600 Con Pacific....2¾@2.60
400 Caledonia (B H)....3½
880 Day....50c
200 Dudley....55c
165 Eureka Con....16½
50 Endowment....15c
1900 Fourth July....40@35c
175 Gila....10c
225 Goodshaw....25c
300 Grand Prize....3.30@3½
1000 Highbridge....30c
20 Independence....2.85
250 Jupiter....40c
300 Leopard....1.35
150 Leeds....70c
165 Manhattan....2¼
165 Mono....3½@3.30
100 N Noonday....75c
150 Noonday....2½
40 Navajo....20c
1000 Oriental....50c
250 Paradise....1.40
75 Raymond & Ely....3
550 Star....45c
580 Summit....1.85@2
615 S Bodie....35@40c
300 S Bulwer....50c
165 Syndicate....2.55@2¾
1100 Tuscarora....10c
55 Tioga Con....2¼@2.15
200 Tiptop....75c
1200 Vortex....60@70c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., May 8.
120 Alpha....17@17½
425 Alta....5@5⅛
210 Best & Belcher...14½@14⅜
745 Belcher....4½@4¼
305 Bullion....4½
290 Benton....3½
2380 California....7@7¼
1450 Con Imperial....1.20@1¼
595 Crown Point....3.95@4
185 Confidence....11@11¼
200 Caledonia....1.40@1¼
250 Challenge....2¼
420 Exchequer....4.45@4½
70 Flowery....55c
615 Gould & Curry....7⅞@7¾
455 Hale & Nor....10¾@10⅝
255 Justice....3@3¼
315 Julia....3@3.40
35 Kentuck....4@4¼
185 Lady Bryan....50c
245 Lady Wash....1
160 Leviathan....65@60c
525 Mexican....31@31½
50 Mountain View....7
200 New York....60c
50 North Con Vir....9
485 N Bonanza....1.20
1550 Ophir....31½@33
165 Overman....7
215 Savage....9⅞@9⅜
530 Sierra Nevada....42½@43
415 Silver Hill....1.30@1¼
375 Scorpion....1.95@2¼
200 Solid Silver....25c
450 Trojan....5c
215 Utah....13
270 Union Con....64½@65
205 Ward....85@90
830 Yellow Jacket...13⅞@13⅝
AFTERNOON SESSION.
800 Argenta....1.40@1¼
500 Booker....45@40c
245 Belvidere....1@85c
185 Bulwer....11½@11½
320 Bodie....9¾@9
405 Bechtel....1
100 Black Hawk....1⅞
100 Belmont....40c
300 Champion....5c
575 C Pacific....2.60@2½
500 Dudley....30@25c
100 Day....40c
600 Endowment....15c
85 Eureka Con....17
500 Fourth July....35c
320 Golden Terra....14½@14
25 Giant & O A....5
200 Goodshaw....25c
300 Grand Prize....3.40@3½
50 Hamburg....40c
400 Hillside....2¼
100 Highbridge....35c
850 Independence....2¾@2.90
30 Jackson....6
300 Jupiter....50c
980 Leopard....1½@1.40
100 Leeds....75c
200 Martin White....7
440 Mono....3.40@3.35
295 Navajo....20c
1115 Noonday....1.90@2
190 Northern Belle....7
25 Raymond & Ely....3½@2⅞
100 Real del Monte....3
640 S Bodie....40@35c
45 Silver King....8
120 Syndicate....2¾@2.80
210 S Bulwer....60c
115 Tioga Con....2.30@2¼

Thursday A. M., May 15.
130 Alpha....16¼
160 Alta....6¾
250 Andes....20@25c
235 Best & Belcher..14¼@14⅜
430 Belcher....5@5⅛
600 Bullion....4¼@4.35
230 Benton....4¼@4.35
215 California....6¾@7
750 Crown Point....4.40
500 Con Imperial....1.20
160 Chollar....5¼
1058 Con Virginia....6¾@6⅞
345 Confidence....12@12⅜
220 Caledonia....1.95@2
220 Challenge....2½@2.40
350 C Dorado....2.35
300 Exchequer....4¾
775 Flowery....75@70c
595 Gould & Curry....8⅛@8¼
185 Hale & Nor....12½@12¼
220 Justice....3.20@3¼
50 Julia....3.35@3.30
50 Kentuck....4
650 L Bryan....45@50c
330 Lady Wash....1.30@1.35
100 Leviathan....55c
400 Mexican....31½@32
50 Mt View....5
225 Mackey....1.15@1.10
900 New York....55@60c
40 N Con Vir....10
1350 N Bonanza....1.40@1.55
950 Ophir....36½@36¼
50 Overman....7¼
120 Potosi....3.05
130 Phil Sheridan....45c
155 Savage....11@11⅛
90 Sierra Nevada....44½
850 Succor....40@50c
590 Silver Hill....1.80@1¾
455 Scorpion....2½@2.55
150 Solid Silver....25c
100 Trojan....25c
65 Utah....13@13¾
305 Union Con....69@68
185 Ward....95c@1
270 Yellow Jacket...14¼@14⅛
AFTERNOON SESSION.
200 Albion....30c
930 Argenta....1¼@1.20
365 Bodie....11
830 Bechtel....85@90c
500 Belle Isle....40c
270 Booker....45@50c
610 Belvidere....75@90c
300 Black Hawk....1⅜@1.40
164 Bulwer....10¾@11½
700 C Pacific....2.80@2.85
300 Caledonia (B H).3.60@3½
255 Day....40@70c
110 Eureka Con....17½@18
100 Giant & O A....6
10 Grand Prize....3.20
500 Independence....2.80
200 Jupiter....40c
200 Leeds....70c
1000 Leopard....1.35@1.40
615 Mono....3¾@3.70
30 McClinton....70c
105 Manhattan....2½@2.40
70 Northern Belle....7
400 Navajo....20c
150 Noonday....2.35
930 Oriental....50@60c
30 Raymond & Ely....3
150 Silver King....8
560 S Bodie....1.35@1.30
650 S Bulwer....50@40c
150 Summit....1.85@1.90
400 Star....45c
100 Tuscarora....10c
265 Tioga Con....2¼@2
150 Tiptop....75@80c
1100 Vortex....70@60c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Audes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Booker Con G M Co	California	2	25	Apr 23	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
DeFrees M & M Co	Nevada	9	10	Mar 11	——	May 20	T E Atkinson	318 Pine st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 31	H A Whiting	211 Sansome st
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
Modock Con M Co	California	8	50	Feb 13	——	May 15	J W Pew	310 Pine st
Mono G M Co	California	3	50	Mar 27	May 1	May 21	Wm H Lent	309 Montgomery st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Trojan M Co	Nevada	10	25	Apr 9	May 15	June 6	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	6	50	Mar 29	May 1	May 20	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	C H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Amazon Con M Co	Nevada	6	10	Mar 24	May 12	June 3	Jno Crockett	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Butte Creek H M Co	California	2	25	Apr 16	May 17	June 17	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 26	O H Bogart	106 Leidesdorff st
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
Mayflower Gravel M Co	California	4	10	Mar 26	Apr 30	May 20	J Morizio	328 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
North Noonday M Co	California	1	20	Mar 27	May 2	May 23	G A Holden	310 Pine st
Noonday M Co	California	2	20	Mar 27	May 1	May 22	G A Holden	310 Pine st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Silver King South M Co	Arizona	3	10	Mar 12	Apr 23	May 20	A Judson	320 Sansome st
Seg Europa M Co	Nevada	1	25	Apr 4	May 8	May 27	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
Sophia G M Co	California	1	02½	Apr 23	May 26	June 13	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Tiger M Co	Arizona	3	30	Mar 14	Apr 23	May 19	W H Lent	309 Montgomery st
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st
University G M Co	California	1	10	Mar 1	Apr 5	Apr 26	Wm Letts Oliver	328 Montgm'y st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Adams Con M Co	——	W W Traylor	309 Montgomery st	Annual	May 19
Golden Gate Con H M Co	California	Jno T Ccoghehau	318 Pine st	Special	May 23
Pioneer Con M Co	Nevada	J M Buffington	309 California st	Special	May 19
Hussey Con G & S M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 26
San Francisco C M Co	——	P Sanchez	258 Market st	Annual	May 20
Silver Hill M Co	Nevada	W E Dean	203 Bush st	Annual	May 26

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	April 15
Excelsior W & M Co	California	G P Thurston	316 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	Apr 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12

Pacific Board—Latest Sales.

Wed'sday A. M., May 14.
90 Alpha....16¼
100 Alta....6.55
155 Belcher....4¾@4.70
30 Bullion....4.30
60 Best & Belcher...14½@14¼
25 Con Imperial....1.20
170 Con Virginia....7¼@7.15
30 California....6.95@7
50 Chollar....5⅞
100 Crown Point....4¼
100 Exchequer....4.70
160 Gould & Curry....7⅞@8
50 Hale & Nor....12
150 Justice....3.20@3.15
70 Julia....3 10@3¼
150 Mexican....31¾@31¼
300 New York....50@55c
185 N Bonanza....1.05@1.20
160 Ophir....34¼@36
30 Overman....7¾
50 Potosi....3.10
110 Silver Hill....1.80@1⅞
30 Savage....10⅞
150 Union Con....66½
70 Utah....13@13½
200 Ward....95c
180 Yellow Jacket....14
AFTERNOON SESSION.
100 Argenta....1.30
150 Andes....25@22c
150 Alta....6½@6.40
100 Bechtel....75c
5 Bodie....9
30 Bullion....4.35
100 Black Hawk....1.35
100 Benton....4¼
170 Best & Belcher....14@14½
50 Belcher....4.80
50 Con Imperial....1.20
70 Crown Point....4¼@4.30
10 Confidence....11¼
60 Con Virginia....7¼@7⅛
20 Exchequer....4.70
100 Gould & Curry....8
200 Herald....30c
70 Hale & Nor....12⅞@12
60 Justice....3.20
20 Julia....3.35
100 Mackey....1
65 Mexican....32¼@31⅞
400 New York....55@50c
325 N Bonanza....1.15@1.20
120 Ophir....36⅜@35¼
90 Overman....7⅞
1325 Succor....35c
150 Silver Hill....1.85
1000 S Bodie....40c
10 Utah....13½
10 Union Con....67

California Board—Latest Sales.

Wed'sday A. M., May 14.
120 Ætna....10c
20 Alpha....16½@16⅝
80 Alta....6¾@6⅝
100 Atlanta....1c
250 Andes....23@25c
40 Belcher....4¾@4¾
60 Best & Belcher...13¾@13⅞
200 Brilliant....50c
20 Bullion....4.05@4.10
140 Caledonia....1.85@1.80
60 California....6¾@7
60 Con Virginia....7¼
250 Con Imperial....1.15
40 Crown Point....4.10
50 Challenge....2.45@2½
80 Exchequer....4.80@4¾
100 Globe....11c
90 Gould & Curry...7⅞@7.65
200 Hussey....15c
120 Julia....3¼
80 Justice....3¼@3.20
50 Lady Wash....1¼
40 Mexican....31½@31⅛
100 Monumental....2c
250 New York....55@60c
30 Ophir....35¼@35⅞
30 Savage....10@10⅛
50 Sierra Nevada...44½@44¼
100 Silver Hill....1.85
50 Silver Jacket....75c
1700 U Flag....4c
135 Ward....1
40 Yellow Jacket..13⅞@13¾
AFTERNOON SESSION.
40 Alpha....16½@16⅝
50 Alta....6¾@6⅝
400 Ætna....10c
175 Argenta....1¼@1.20
70 Belcher....4.90@4.95
20 Bullion....4.35@4.30
150 Brilliant....20@25c
40 Best & Belcher..14½@14¼
70 California....6¾@7
40 Con Virginia....7¼@7½
30 Crown Point....4.40
90 Caledonia....1.90@2
500 Coso Con....5c
70 Exchequer....4¾@4¾
200 Enterprise....1¼
80 Gould & Curry....8¼@8⅛
100 Golden Chariot....5c
150 Glynn Dale....70c
300 Goodshaw....25@22c
50 Hale & Nor....12¼@12⅝
10 Julia....3¼
40 Justice....3¼@3.20
200 L Bryan....45@42½c
40 Mexican....32¼@32⅛
100 Newark....20c
100 New York....56c
50 Ophir....37@37¼
500 S Utah....1c
100 S Bodie....40c
30 Savage....11¼@11⅛
30 Sierra Nevada....45@45⅛
110 Silver Hill....1.90
100 S Bulwer....60c
100 Succor....40@35c
20 Tiger....1¼
20 Union Con....67@57¼
200 Wells-Fargo....5c
20 Yellow Jacket...14⅜@14¼

TRANSACTIONS in mining stocks are rapidly increasing in New York.

Mining Share Market.

As might be expected from the nature of our peopls and the course of preceding events, the stock market for the greater part of the past week has been in a condition of depression and demoralization. The surprise at the unexpected way in which the election turned, naturally caused stocks to tumble, and the timidity of dealers has, for the most part, kept the markct at a very low ebb. Everybody seemed confused and desirous of holding off till it could be seen how the market would adapt itself to the new order of things. And enrly in the week the uncertainity had the effect of bringing out n largo ins of "shorts."

The panic was further increased hy a lessening of favorahle reports from the Comstocks. On Tuesday, however, a better condition of things prevailed, and the stock people seemed to have again regained their confidence. The stronger tone was particularly evident in the watsr stocks and their neighbors. The north enders also reachcd higher figures, and in many others thsre was a moderately active market. What this change purports it is hard to say. Probahly it ia due to the hetter tone of things heard from the Comstocks, resultiug from "finds" and the approach of the Sutro drain to completion. In nny case the general impression seems to be thnt it is the foundation of a stronger and firmer market somewhere in the near future.

Vulcan Blasting Powder.

The Vulcan Powder Company, of this city, has just issued a little pamphlet devoted to n desoription of their peculiar products, and giving directions for its use. There are three grades made. No. 1 for very hard rock, houlders, iron, etc.; No. 2 for sinking and drifting in medium hard rock, sandstone, limestone, etc.; No. 3, for bench work, pipe clay, cement, soft and shelly rock, quarrying, etc.

We quote the following paragraphs from the pamphlet referred to:

"Prior to the introduction of Vulcnn hlasting powder, the amount of "high grade explosives" used was small compared to the present consumption. This was largely owing to the prices then demanded. Knowing that reasonahle rates for powder would stimulate our mining industries, and, by a reduction in running expenses, encourage the working of many abandoned mines, we have made it our rule to sell as cheaply as possihle; and we claim that it is owing to our efforts that miners can now get better powder for less money than they could four years ago.

"Believing that merit will win, it has been our aim to place on the market the hest powder manufactured in the United State. We have succeeded, nnd are now producing an explosive, in which the following essential qualities are combined:

"1st. Strength.—The various grades of Vulcan are stronger than corresponding grades of other manufacture. Vulcan is the true explosive; every particle exerts force; it contains no inert matter; therefore not an iota of powder is lost. The testimony of those who have used Vulcan substantiates this claim, and we ask consumers to test it for themselves.

"2d. Uniformity.—It is a matter of great importance to miners, that the powder they use should he uniform in quality, and reliable. Our process of manufacture is so systematized that Vulcan powder is always of uniform strength.

"3d. Snfety.—Vulcnn powder is strongly recommended for its safety in transit, storage and manipulation.

"4th. Freedom from Fumes.—The ahsorbent used in Vulcan powder is completely decomposed hy its explosion; the smoke passes off quickly, and miners can then resume work without experiencing the unpleasant sensations customary with other "high explosives." In the manufacture of the latter, a non-explosive absorhent is employed; and consequently, after a blast, the air is filled with the minute particles of this neutral absorbent. This dust catches the fumes from the explosion, and holds them in suspension for a long time; hence the headache and nausea caused by the sickening and noxious fumes peculiar to these imperfect powders.

"5th. Cheapness.—The Vulcan Powder Co., largely composed of consumers of hlasting powders, has been appropriately called the Consumers' Company. Such heing the case, and since our business is conducted economically as well as systematically, we defy competition."

The pamphlet may he ohtained from the Vulcan Powder Company, No. 123 California street, in this city.

Bullion Shipments.

Since our last issue, we havo noticed the following bullion shipments:

Ophir, May 9th, $42,109.14; Standard Con., May 10th, $29,248.92; Paradise Valley, May 9th, $3,831.06; Christy Con., May 19th, $5,290.

ONE HUNDRED striking miners stopped work at Elrich & Co.'s mine, Indiana, and heing nearly famished devoured the contents of the miners' lunch baskets.

Mining Summary.

The following is mostly condensed from journals published in the Interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ILLINOIS CALIFORNIA.—*Signal*, May 7: Operations have been suspended on this mine. Messrs. Bunt and Riley have completed their contract, running several inches more than was required by the agreement. The rock in the face of the tunnel is quite soft, with more or less water, which, taking into consideration the charsrter of the rock passed through, and absence of water, is thought to be an excellent indication of the close proximity of the ledge. Mr. Bunt thinks that if the ledge has not been cut or slid off, that it certainly should be found in 50 ft.

AMADOR.

GOOD PROSPECT.—*Dispatch*, May 10: Messrs. Lorraine and Marshall have commenced taking rock from a ledge they discovered near Jackson Gate, which shows very flattering indications. Free gold can be seen scattered through it in abundance. The rock, it is calculated, will yield at least $60 per ton. The ledge varies from one and a half to four ft wide.

SUTTER CREEK.—A fresh recruit of miners have been set to work on the Mahoney mine, and things thereabouts are assuming a lively, business-like aspect. They propose to sink a perpendicular shaft to the depth of 1,000 ft, and it is thought that it will take about a year to complete it. The new hoisting works at the Amador mine are nearly completed, and it is expected that they will got steam up about the last of the present month.

CALAVERAS.

SHEEP RANCH.—*Chronicle*, May 10: The mine which was formerly the Ferguson & Wallace, Mr. William Clary Superintendent, gives employment to about 80 men. The machinery is in charge of Mr. B. F. Howard, who is chief engineer and machinest. The mill has 20 stamps and all the modern improvements for extracting the precious stuff from the rock. The hoisting works are some 180 ft from this mill, and as the rock is hoisted from ths shaft it is run by car to the stamps. The shaft is 300 ft in depth, with rich rock at the bottom. Ths drilling in the mine is done to a great extont by ono of Ingersoll's compressed air drills.

GOLDEN STATE COPPER MINE.—This mino is seven miles west of Copperopolis, one and a half miles east of Telegraph City, located on Sheelay gulch. This property is owned by parties residing at Live Oaks, San Joaquin county. The mine is under the superintendency of Mr Oxeudine. At present it is looking well. A two-ft veinat a depth of 50 ft. Sbipments of ore to Milton will be made soon.

GWIN MINE.—Work at the Gwin mine, despite the large amount of water encountered, is progressing favorably. The Alexander shaft is being put down as fast as possible, and the ore mined is fully up to the standard of good milling rock. The completion of the Alexander shaft will put the mine in better condition for working to advantage than ever before and greatly lessen the difficnlty now experienced from an sxcess of water.

DEL NORTE.

QUARTZ MINING.—A company has been formed for the purpose of working a gold-bearing quartz ledga in the Bald hills, situated about 14 miles from Crescent City. Tho quartz is said to be very rich with gold, and it is thought will prove a bonanza to its owners when properly daveloped.

INYO.

MODOCK.—*Independent*, May 3: Tunuel, 1000 level, run 48 ft, making total length 1,528 ft. Shaft from 300 level sunk 13 ft, it being now down 301 ft. Upraise from 1000 level raised 10 ft; present hight of raisc, 112 ft. Distance betwesn bottom of sbaft and top of raise, 75 ft. From present appearances, the connection should be made in three weeks, or four at tho outside, when prospecting veln matter passed through in the tunnsl can bs begun at once. Ground in face of tunnel continues the same. Easy-breaking white lime, such as is found next to oreground in East Confidence upper level. Work for the past week has made good headway at all points.

NEW COSO.—The New Coso furnace at Darwin is receiving ore from ths Modock, Minnietta and Custer. A lot of 12 tons more is to go from the Ygnacio. Bolsy & Tuttls have from 10 to 12 tons of their rich ore, whieh Mr. Woodhull, of this point, is to go down and attend to the sampling, assaying, etc., for the owners.

CLEAN UP.—The Mammoth mill, at Lake, after a run of 22 days, bagan a clean-up and expected to make its first shipment of gold, amountin; to $100,000.

A LAROS LEDGE.—Mr. S. A. Deusmore lately brought in some very fine-looking specimens of rich base-metal ore from a new discovery of his near the summit of Inyo range. Thera is a solid ledge seven ft in widtb, tho ore carrying about 60 ounces of silver per ton.

MONO.

CON. PACIFIC.—Bodie *Standard*, May 9: A rich strike has been made in Con. Pacific, a mining enterprise located on the western brow of Bodis bluff, or rather High peak, nndsr which the rich chimneys of the Bulwar, etc., ars found. The winze on ledga No. 2 was sunk to a depth of 132½ ft below the old tunnel on line of ledge, or a depth of about 160 ft from the surface. At this point a crosscut was run east a distanec of 36 ft for tha purpose of tapping ledge No. 1. Thls crosscut was a complete success, for the ledge was cut and found to be upwards of 20 inches in width and quite rich, free gold being visible in the ore at a number of placss. Ths fissure is perfectly defined and the filling of ore decomposed and easily separated and extracted. This ledge was crosscut from the above-mentioned tunnel, where it resembles in extent and character that below, but is less decomposed and rich. Ledge No. 2 more than held its own all the way down the winze, having a width of from 18 inches upwards, and the ore getting richer with depth. Both ledges dip to the east. This givss the company two "backs" of 150 ft hight each, and 200 ft in length at least, of an excellent grade of milling ore. It is proposed to sink a winze on ledge No. 1, at the point where recently crosscut, and to a depth equal to that on No. 2. This work will develop the north end of tbe claim to a depth of 300 ft, or perhaps to a level with ths Bulwer tunnel, which will pass through the ground a convenient distanes north of tha winze. At a more soutberly portion of the claim, or about 500 ft from the winzes, a main working shaft, double compartment and well timbered, is down 220 ft. It is to ba sunk to 250 ft before crosscutting will bs inaugurated. In the meantime, hoisting works are contemplated. This shaft already promises interesting developments, as quartz is coming in, with an eastern pitch, that assays in gold. This was observed at a depth of 210 ft, where the cap rock or looss formation was passed through. This shaft is judiciously located on tbe bench west of the Bodis, whera the latter struck it so rich. Tbs claim is 300 by 1,400 ft in dimsnsions; title perfect.

THE SYNDICATE.—The quartz indications have been gathering force, until a ledge about 10 inches in thickness has formed of a grade that would well pay to mill, according to every test applied, with more stringers and every feature of the formation tending to tho belief that a very important development is not far distant. The water is still strong and suggestiva of a permanent ledga of no small proportions somewhere in tha neighborhood. The ledge, stringers and incasing rock dip to the west at an angle of about 60°. Tha beader of tha tunnel is about under the crest of Bodie bluff, or 700 ft from the surface. This showing of quartz seems to come up deep from the south, the tunnel running in under it.

STANDARD.—The most gratifying development in the Standard claim is the showing of tbe old lode north from the new works. The ledge is drifted on toward the north line, a distance of 170 ft; it dips very flat to the west, and corresponding to that between the 550 and 650 levels in old incline. The ore body has been widening very materially for over 100 ft in drift, and is now all but six ft in width of clean vein matter that will mill over $100 per ton. Walls perfect. An upraise to connect with old works is in 40 ft. An east crosscut from the north drift in 63 ft; cut an 18-inch ledge of good ore. Winze on the Cook or Burgess ledge is down 40 ft, and in ore of high grade. The drift on the Gilden ledge is 140 ft in length, and in same clean vein as usual. The crosscuts east and west on the 700 level are respectively extended over 70 and 90 ft; generally hard ground. Stringers of quartz are also a feature. In the old works, above the 200 level, a great quantity of ore is being laid bare, and in the crosscut east, 300 level, new ground of importance is developing between Standard and Summit.

BULWER.—Drifting on tha Stonewall, 400 level, is north 53 ft; south 43 ft. Ledge broken, but less so than heretofore. From drifts above, ore is being obtained to supply the Bodie mill; main drift south, 400 level, on the Ralston, now near 500 ft in length all the way in ore, is still being extended.

NEVADA.

PLACER NOTES.—*Transcript*, May 10: Tha Polar Star and Southern Cross have never yielded better than this season. The Polar Star has now dirt capable of yielding $1,000 for 24 hours' run. The two claims employ 35 white men or more, at $2.50 a day. The clean-up in the Franklin, though not as good as reported, is still encouraging, and the company have determined to prepare the mine for drifting after tho water ceases. It is their intention to run a drift entirely through their ground for drift dirt during the summer. The Central, owned by the Cedar Creek Co., recently gave quite a handsome clean-up. The company have a full quantity of hands at work night and day. At little York they use two pipes with 3,000 inches of water, employing 23 white men and about the same number of Chinese. At Christmas Hill, four white men and eight Chinese. At Liberty Hill, 15 white men and 5 Chinese. Mr. Morgan anticipates water for the usual length of time, and regards his prospects all around as very flattering this season. The mines at You Bet are also yielding well this season. Tha Hussey, worked for 20 years, never paid better. Only one pipe carrying 450 inches of water is used here. The Nevada mines, owned by Mr. Hayward, at You Bet, are giving large returns. Four claims are run in this property, employing 36 white men, and a few Chinamen being hired only in one of the four, on account of the return of the work. They use 2,400 inches of water, with a bank 130 ft deep, and have water all the year. The surface dirt will last five or six years yet. The Bird's-eye Creek mining company, owned by the English company, gives the same flattering account. Forty white men are employed there, with some Chinese. Two thousand inches of water at used, which Mr. Powers calculates will hold out until the 1st of September. Wages through this section range from $2.50 to $3 a day. At Mr. Hayward's mine, the hands are boarded at a charge of six bits a day per man. The decision against the mines obtained in the late debris trial at Marysville, will not be enforced this season, if the owners of ths mines involved use all diligenca in bringing the case before the Supreme Court. The only claim in Shady Run working at present is the Live Yankes. The owners are now drifting parallel with the channel and getting good pay. At Blue Canyon, only the Hartnell hydraulic mine is at work. The owner reports good returns.

THE KENTON MINE.—The prospects of tbe Kenton quartz mine, near Alleghany City, Sierra county, are daily improving. An extensive body of rich ore is developed and ready for extraction. Over 1,000 tons is now in sight in the mine. The taking out and crushing has now been going on for saveral weeks, and with highly favorable results. There is sufficient water to run all the machinery, and the expenss is consequently light. About 20 skilled miners are now employed at the Kenton, besides a considerable force of other workmen.

PLACER.

THE FRANKLIN.—Dutch Flat *Forum*, May 8: The Franklin Gravel mining company, of this place, are running powder drifts and fitting their claim preparatory for another run under ths supervision of E. Miner. They will burn 9,000 pounds of Judson powder the latter part of this week. The gravel looks well in this mine, and good results are anticipated from this run.

THE MOUNTAIN CHIEF.—*Herald*, May 10: Tbis is the name of a new mine that is being developed on the Forest hill divide, near the Sugar Pine mill. From prospects heretofore made, and other indications, thera is supposed to be an immense gravel channsl, rich in gold, lying under the ridge, and crossing in the vicinity of the Sugar Pine mill. With tho views of prospecting for this channel, a number of local capitalists and miners associated themselves together some time ago, and commenced operations. They gave to their mine the name, Mountain Chief. The company consists of J. B. Seller, M. Hoffman, D. Bowers, F. Outhouse, John Beckstrom, Gso. Hfill and Wm. Smith. The immensity of the channel known to underlie the location attracts much interest to their enterprise. If they find ths gravel as rich as expected, there are millions of money, we are told, ready to be invested in that section at once. They are now down on their lueline about 330 ft, and tho indications at that depth ars very favorabls.

SHASTA.

HOLCOMB'S.—Cor. *Independent*, May 8: Mr. Holcomb had rock assayed from three different ledges, with the following result, per ton: The first croppings in gold, $78; the second, four ft from the surface, in copper, $33 and silver, $2.72; the third cropping, in copper, $23. Mr. Holcomb has what he supposes to be a deposit of cinnabar, in a cut about 15 ft deep. Ths rock (apparently a ledge) is of a dark red color, dotted with small dots of light red, resembling the color of the vermilion of commerce. The rock apparently is seamy, and on being separated, the parts are found to ba coated with a very thin coating of a minsral resembling in color sulphuret of mercury. The bank over this ledge is of a red color tinged with purple. Through small fissures in ths rock and bank issues a soft white substance, which resembles yellow, in feel, and on which fire has the same effect as upon ordiuary rock.

SIERRA.

A RICH STRIKE.—Downieville *Messenger*, May 3: A rich deposit of gravel has recently been discovered, or rather stumbled on, in Howland Flat, that bids fair to rival in extent of product, anything that has hitherto been developed on the famous Blue Lead. A few weeks since, a couple of enterprising mining sxperts, Conroy and Kelly, started to prospect the locality of Bull's Run, where by perseverance and industry, they have succeeded in finding a valuable piecs of mining ground, that had by soms chance escaped the notice of all former prospectors. While tracing the course of a stream of pay gravel, found upon the edge of the ravine, they discovered a "blind channel," and upon prospecting, they discovered an immense deposit of pay gravel.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, May 13: The north drift, 2000 level, is now in 270 ft from tha sonth line, the face in hard blasting porphyry. The drift running south on the 2300 level from the 2200 level of tha Sierra Nevada incline is now 122 ft in and continues to cut a vein formation carrying streaks of clay.

SIERRA NEVADA.—The incline has still 30 ft to go to reach the 2400 level, and will then ba continued for a sump. The water continuos strong, but is well handled by the pumps. The work of extracting ore on the 2200 level has been commeneed, and soon the average amount taken out will be 70 tons per day. What ora is taken out is being stored at the Mariposa mill, which will be set to crushing it as soon a sufficiant amount has accumulated to insure it steady work.

JUSTICE.—The drift, 1300 level, along the west wall is being continued and is opening up a formation of exceeding promise, the quartz seams being stronger and the ore bunches larger and richer than in the crosscut leading in.

CON. IMPERIAL.—The new air compressor is in place and working well, and work has been resumsd throughout the mine. The Alpha joint winze is being continued on down, the engine there having been altered to a counterbalance.

MEXICAN.—The joint Union winze from the 1600 level is making slow progress on account of the clayey nature of the vein material ancountered and water flowing in. The drift, 2000 level, connecting the top of the joint Ophir upraise with the main north drift, has been enlarged and timbered, rendering ventilation in that part of the mine much better.

SAVAGE.—The work of retimbering the incline and of repairing the north lateral drift, 1600 level, is going on as usual. The water is now about 65 ft on the incline below where it originally stood.

SUTRO TUNNEL.—Work has been commenced on the subdrain as far up as the Julia branch. There are now 1200 men employed, and the tunnel will be ready about the middle of June.

BELCHER.—The south drift, 2500 level, is averaging four ft per day, its face in porphyry, clay and quartz, 413 ft from the incline. The mass of clay and quartz mixed which is encountered in this part of the mine is greatly in excess of anything ever found before on the west side of the vein. The crosscut, 2300 level, on the south line has penetrated quartz a distance of 30 ft, average assays from which are $7.

JULIA CON.—Owing to the bursting of the water cylindor in the No. 9 Knowles pump on the 2000 level, allowing that to be flooded, nothing has been since done toward repairing the broken drifts. The water was, however, cleaned out and work resumed.

BEST & BELCHER.—The joint east crosscut, 1700 level, is now in 832 ft, the face in a soft vein formation of porphyry and clay, which requires close timbering. The drain tunnel connected Saturday after having run 400 ft.

NORTH STAR, VIRGINIA.—Sinking is going on as usual, the bottom of the shaft being 32 ft below the 1700 level and in hard blasting porphyry.

SILVER HILL.—The incline has reached the 1300 level and will be continued 40 ft further for a sump. Workings from the south drift from the new Waller Defeat shaft are being prosecuted, and have encountered six ft of low-grade ore, which will pay to extract and mill.

CROWN POINT.—Drifting north, 2500 level, crosscutting joint with Belcher on the same level and 127 ft further north, and sinking the winze from the 2500 level.

OVERMAN.—The winze below the 1000 level is being continued as usual. In the north drift, same level, the time has been spent of late in putting in a drain.

YELLOW JACKET.—Ths new shaft is averaging four and one-half ft per day in increasod depth, and is now down 2,514 ft. A drift has been started from the 2500 station to meet that running toward the shaft on the 2400 level of the old works and has been advanced 40 ft.

CON. VIRGINIA.—The repairs to the machinery, etc., of the C & C shaft have been completed, and active operations have been transferred to it from the Consolidated shaft, exeopt on the 850 and 1500 levels. Work has accordingly been resumed in the south drift, 2150 level, in joint winze No. 3, 1950 level.

ALTA.—The station at the 1750 level of the joint Benton incline winze is being opened up. Ths timbers of the north drift, 1550 level, into Benton ground, are still being eased. This work will be completed the first of the coming week.

CALIFORNIA.—The joint west drift, 850 level, is averaging four and one-half ft per day in a formation changing from porphyry to vein material; total length, 155 ft. Joint crosscut No. 1, 1850 level, has been started up again. It is being run west from a point 102 ft south of winze No. 3.

UTAH.—Sinking is going on in the inclins, the bottom being in a harder and better formation, so that it is no longer necessary to drive lagging ahead. Tha water is about the same. Total depth of the incline, 495 ft on the stops below the 1350 level.

OPHIR.—A drift has been started north from the bottom of No. 1 winze from the 2000 to the 2100 level, and is following the ore vein in that direction. The drift south from the same point is in 68 ft, and still shows good ore in the face. The drift on the 2000 level, connecting the top of the joint Mexican upraise with main north drift, has been enlarged and completed, improving ventilation materially.

GOULD & CURRY.—The joint east crosscut, 1700 level, is averaging four ft per day through a mixturs of soft porphyry and clay, which requires it to be closely timbered. This drain tunnel was connected with tbe shaft last Saturday. Its total length is 400 ft, and its point of intersection 140 ft from the surfacs.

HALE & NORCROSS.—The new lightning drift, 1620 level, to connect with the Julia branch of the Sutro tunnel, is averaging 12 ft per day, and is now in 108 ft. Tbe water stands 65 ft below its old level, which was 47 ft below the 1700 level. It is still raising slowly.

NORTH BONANZA AND FLOWERY.—The north drift on the 200 level is averaging five ft per day. Work has been resumed in both the north and south drifts, 300 level, and both are making good progress.

BULLION.—A blower and engine are being put in on the 1350 level—the 1700 level of the Imperial—to furnish air to the lower levels of tha mine.

WARD.—Sinking is making usual progress. The bottom of the shaft has of late encountered some fine-looking stringers of quartz, carrying a large proportion of iron pyrites.

LADY BRYAN.—The shaft is nearing the 750 level and is without material change. The drifts north and south, 600 level, are in fine-looking quartz giving low assays.

SUCCOR.—Tbe drift north, 1100 level, continues to cut a very promising vein formation containing some fine-looking quartz, yielding low assays.

ANDES.—The upraise from the 350 level has reached the level above, and ths work of clearing out preparatory to prospecting has been begun. A new upralsa has been started some 250 or 300 ft further north.

EXCHEQUER.—The Imperial air compressor having been placed in position, work has been resumed in the 2400 north drift. Ths face is in a fine formation of porphyry, carrying streaks of quartz.

CALEDONIA.—Work in the winze has been interfered with of late by the cutting out of a station in the side of ths drift, 1600 level, to put in a blower.

MT. HOOD & VANCOUVER.—Good progress is being made in extending the drift, 1400 level. The face is now 150 ft from the shaft, and in hard, blasting rock.

BELMONT DISTRICT.

BELMONT.—*Courier*, May 10: The prospects of the mine are without change. During the week have advanced east drift from winze 14 ft, west one 10 ft, both of which are showing good milling ore. Tbey will commence to take out ore from west side of winzs tbis coming week. The 300 level drift from shaft is looking more promising every day. Have made 22 ft on same level from south raise—have made slow progress as ground is hard and air bad. Will take at least two weeks more to make a connection.

HOUSEBRIDGE.—Have finished sump and are crosscutting ledge on 6th level 70 and 140 ft south of shaft. Have not done enough work to determine how much ore the ledge carries at thase points. Will soon resume extending northb drift on 7th level. They are now hoisting sufficient watsr to run the hoisting works.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, May 11: There is no particular change to note in tha condition of tbo mine. The following work has been done in the several levels: 5th, east drift has been continued 24 ft, and is now in 67 ft; 7th, started a drift running northwest, and made 24 ft; 13th, east drift has been continued 23 ft, and is now in 39 ft. The west drift has been continued 18 ft, and is now in 47 ft. The incline has been sunk 22 ft, and is now down 62 ft below tha station.

HAMBURG.—East crosscut on 000 level is now in 33 ft, following a cross vein or seam of ore. The entire crosscut is in favorable vein matter. South drift from the west crosscut on the same leval was advanced 10 ft along

[Continued on Page 324.]

Practical Divisibility of the Electric Light.—No. 1.

A paper, by E. J. Molera and J. C. Cebrian, read before the California Academy of Sciences, April 21st, 1879.

We wish to communicate to this academy our new system of the economical division and distribution of light in general, for its application to all purposes of lighting, both public and private; being a practical solution to that great desideratum, the

Divisibility of the Electric Light.

In the last few years the *electric light* has asserted its own prominent placo before the world, and its great advantages begin to be generally acknowledged; the methods to produce it have attained the necessary perfection to be practical to a large extent, as we find it now successfully used in the lighting of large spaces, such as theaters, factories, railroad depots, stores, lighthouses, government buildings and similar places.

The superiority of the electric light upon any other is of various kinds: Examined by the spectroscope it is found to be nearly equal to sunlight; it does not alter the natural color of objects, is soft, white and brilliant; whereas *gaslight* is of a dirty yellowish color, tiresome to the eye, and alters the natural color of objects.

Then electric light irradiates almost no heat; whereas the heat emitted by gas flames is universally recognized as uncomfortable and very unhealthy.

Moreover, the electric light requires no air to sustain it; whereas gaslight, like all others produced by combustion in the open air, vitiates or poisons the atmosphere, because it consumes the oxygen therof and emits instead the foul products of comhustion, among which are sulphuric acid and sulphurous acid. And it is well proven that an ordinary gas-burner vitiates as much air as four grown persons do.

Again, electric light is odorless, whilst the peculiar fetid odor of gas and gaslight is uncomfortable and unhealthy.

Electric light is not liable to explosions as the gaslight is, nor does it require the expensive, disagreeable and prolonged repairs so often recurring in the gas system.

Finally, electric light is, in fact, far cheaper than gaslight, whenever produced and consnmed in large quantities. If we were to build a complete gas factory for each dwelling or building in a city, the cost of gaslight would be enormous. Yet, such has been the case with the trials of the electric light, which have given the wrong idea of its excessive eost, produced for a single huilding. Electric light has been compared with the price of gas when produced for a whole city, and even thus, in some cases it has proved to he the cheapest.

To show which is in general the relative cost price of electric light and gaslight, we will substitute the price of every item composing the cost of light, in each system, for an amount of coal of an approximately equal price, and we will obtain the value of light irrespectively of the local prices of tbe items. Some dynamo-electric machines produce light at the rate of 6,000 candles per horse power spent. One horse-power consumee from two to seven pounds of coal per hour—to make allowances, let us call it six pounds; the incidental expenses and the repairs of the steam engine, we will put at one-quarter the value of fuel, which is excessive, one and a half pounds; the attendance of the steam engine will certainly not cost more than one-half the value of fuel, three pounds; the expense for carbon points in the latest trials has been only one-half of the value of fuel, three pounds; the incidental expenses and repairs for the electric machines, we will put like those of the steam engine, one and a half pounds; and the attendance of the electric apparatus will certainly cost less than those of the steam engine; but we will call it like tbat, three pounds; in all 18 pounds; add 10% for contingencies, and the result is that 6,000 candles for one hour of electric light, will cost as much as 20 pounds of coal.

Now, in gae making, one ton of coal gives as an average, 9,000 cubic feet of gas; the cost of lime and labor is not less than one-third the cost of coal, or, in our case, 750 pounds, which, added to the ton, make 3,000 pounds of coal. Supposing, now, that the residue of gas making is merchautable to the extent of 40% of the ahove, which is a very favorable case, we obtain as the cost of 9,000 feet of gas equal to the cost of 1,800 pounds of coal. Hence, one pound of coal ie equivalent in cost to five feet of gas, or an ordinary burner of 15 candles in one hour; hence, 400 pounde of coal represent the cost price of 6,000 candles of gaslight in one hour; and, consequently,

$$\frac{\text{Cost price of gaslight}}{\text{Cost price of electric light}} = \frac{400}{20} = \frac{20}{1},$$

or the mere production of the electric light, irrespective of distribution, is not more than the one-twentieth part of the cost of gaslight. The practical application of the electric light in several countries shows that this is near the truth. The most etriking iustance of this fact is the recent trial made in Alhert hall, in London. They used four of the smallest Siemens machines, and four of the Jablochkoff candles at the orchestra. Let it be observed that theee circumstancee were very unfavorable. In the first place, they used small-sized machinery of a capacity of 2,000 candles per horse power, whoreas other larger machines give up to 6,000 candles per horse power; in the seoond place the light wae needed only three hours, and fully one extra hour was spent to put up steam and down the fires; therefore the fuel was wasted 30% above the time needed; in the third place the attendants' wages were paid as a full day's work for only three hours' use. Yet the actual expense of every item, *plus* a liheral allowance for wear and tear, amounted, for that night, to $12.50, having the lighting proved a complete and satisfactory success. In former occasions, the gas bill for the same building and for the same length of time had been (at the low price of London gas) $36.50; very nearly three times as much as the former figure. If we take San Francisco prices for every item, the ahove prices would stand thus: Cost of electric light, $27.50; cost of gaslight, $126; nearly five times as much. If the light had been needed six hours instead of three, the figures would be as follows: Cost of electric light, $39.00; cost of gaslight, $252, or six and a half times as much. We will add this single item: that the cost of instalation of the electric light for that building was $4,000, which is much less than the price of gas-pipes and gas-fixtures of the same building.

The Difficulty.

But although having so many great advantages, the great difficulty with the electric light has been, how to handle it, how to apply it in practice, after the light is produced. All the methods or systems of electric lighting heretofore proposed may be divided into two classes: 1st class. Those that use a few numher of strong lights. 2d class. Those that use a large number of small lights. The strong lights are the cheapest, as demonstrated by practice. While a generator of eleetricity having a capacity of 4,000 candles, requires an expenditure of one horse-power for every 1,500 candles, a generator having a capacity of 30,000 or 40,000 candles, will produce light at the rate of over 3,000 candles per horse power; and iu ease of a higher capacity the production attaius a rate of 6,000 candles per horse power, as said before. But a powerful light of 60,000 candles for instance, cannot be properly used in general; it is too powerful for a small place, and even for a very large place; a number of smaller lights regularly distributed will give a much more efficient illumination. The use therefore of strong lights is very limited in practice.

Consequently the attention has been turned to the second class of illumination; and, having failed in building a machine that would produce a small electric light, at the same cheap rate of a powerful machine, all the endeavors have been directed to the economical subdivision of a powerful electric current into small currents that would produce small lights. All such attempts have been failures, because according to known electrical laws, corroborated by practice, whenever an electric current is subdivided, the light-giving power of each secondary current is smaller than inversely proportional to the square of the number of the sub-currents. For instance, a light of 40,000 candle-power divided into 100 lights, will give 100 lights of four candle-power each, or 400 candles in all; this is a loss of 99%; if the number of smaller lights increases fivefold, the loss will amount to 998 per thousand, and so on.

This evidently places this second class of electric lighting altogether out of any practical application.

Division by Optical Contrivances.

In order to avoid dealing with that electrical law, we were led to try the division of the light itself, leaving the electric current untouched. The result has been our system, in which we only use *optical* means or coutrivances, and it can therefore he applied to the electric light, as well as to any other kind of light.

We take the most powerful source of light obtainable, and place it in a closed chamber or box, called the *chamber of light*. Every wall or face of this box is a condensing lens or a combination of lenses, such that will ehape the light into a beam of parallel rays; some of the walls or faces may be only reflectors, throwing the light upon some of the condensiug lenses. For instance the wall or face holding the stand of the light, will be a reflector.

In thie way, we reduce our source of light to several beams of parallel rays, without the emallest stray ray of light being lost.

When light is not condensed, the intensity thereof is inversely proportional to the equare of the distance from the light, because light is then diffused equally iu all directions around its focus. But when light is condensed, as above said, its intensity along the etraight line of the heam remains unaltered, except a small loes hy diffueion, which for a short distance is small. Therefore our chamber of light permits to send light from one place to another without appreciable loss.

If we intercept one of these beams of parallel rays of light by a reflector, the light will be bent or reflected according to the poeition of the reflector; and it may thus be sent into any desired direction, horizontal, vertical or any way inclined. When the reflector intersects the whole beam of light, this latter one will be bent totally; if only one fraction of the sectional area of said beam is intersected, then the corresponding fractional part of the beam will be bent, leaving the other fraction thereof to follow ite former direction. Therefore, if one of said beams of light is intersected at different poiuts of its length, by different reflectors, intersecting different fractional parts of its section, said beam will be divided into a great number of secondary beame, going into any desired direction, and if these secondary beams are treated in the eame way, tbe main beam can be divided, subdivided, conveyed and distributed to any number of dietant places. If we inelose the main beam in a tube or pipe, and every secondary beam in smaller tubes, branching out from the larger one adjoining it, and we keep the above said reflectors at the elbows and intersections, or T pieces, formed by all tbese tubes, wc will obtain a net or system of pipes or tubes similar to those used in the distribution of gas and water.

Such is onr system: in front of every side or face of our *chamber of light*, we place a box or pipe enclosing the main beams of light; these pipes are laid along the streets; at every side street a smaller pipe will branch out from the main one; at their junction we will place a reflector which will divert into the side street the desired percentage of light. And thus we can provide every street of a city with one or more pipes carrying a known amount of light. Then, from said street pipes, service pipes will be run into every lamp-post and every building, and at the intersection of the latter pipes with the street main we will insert proper reflectors, the size of which will determine the amount of light supplied by every service pipe. In the same way that at present the gas buruers of all the rooms in a house are in direct successive communication with the gas meter or service pipe, for said house, through a net of pipes laid along ceilings and walls; similarly in our system, a net of properly branched out pipes will put in communication every room of a huilding with the above mentioned service pipe; only that we will place at every junction, occurring in said net of pipes, a proper reflector, which will determine the amount of light carried by the corresponding pipe. Thus, the light may come into the rooms through the ceiling or through the walls, every room having as many outlets of light as desired. But the light will enter in a beam of parallel rays; therefore, in order to properly shape it for use, we will place at every outlet of light a *diffusing lens*, called a *secondary lens*, wbich will send the light around in any predetermined shape; thus completing the system of division and distribution of light from a single statiou to any or all the rooms in a city, and with any desired intensity.

Our system allows to control the light in three ways, to wit.: 1st, in its iutensity; 2d, in its shape; 3d, iu its chemical and physical properties.

1ts.—Control of the Intensity of Light.

If the reflectors in the pipes are stationary, the amount of light in every pipe will he constant, as loug as the intensity of the original focus of light remains unaltered; but if said reflectors are made movable, we can control the supply of every pipe, or every set of pipes, at will, by making said reflectors to intersect a larger or a smaller portion of the next preceding beam of light. Therefore the last reflector for every outlet of light will do the same service as the gas keys now in use; because its sliding motion will allow the light to enter the room in more or less quantity, down to a mere glimmer, if so wished. Another way to control the intensity of the light in a room, is by means of a contracting or sliding diaphragm or screen, placed near the outlet of light, and provided with any controlling mechanism which will allow the whole ray of light, or only a part thereof to enter the room.

One of the great advautages of our system consists in the interdependent control of light of several rooms. To illustrate it, suppose we have three adjoining rooms with a common supply pipe; suppose the reflector of the first room intersects the lower third of said pipe, the reflector of the second room intersects the two lower thirds of the same pipe, and the reflector of the third room embraces the whole section of the same pipe. In that way, every room will receive one-third of the whole light in said pipe. Now if we slide the first reflector inside of the two lower thirds of the supply pipe, the intensity of light in the first room will vary at the expense of the second room, aud *vice-versa*; if we slido said first reflector into the upper third of the supply pipe, the iutensity of the first room will vary at the expense of the other two rooms. Likewise, if we leave the first reflector as at the heginning, and then we slide the second reflector inside of the two upper thirds of the pipe, the intensity of the second room will vary at the expense of the third room and *vice-versa*, leaving tbat of the first room unaltered. Finally, if we slide the first and second reflectors in perfectly parallel uniform motion, the intensity of the second room will be constant, and that of the first room will vary at the expense of the third room, and *vice-versa*. What we have said of three rooms, may as well be said of any number of roome, and also of auy number of floors in a building. Therefore our reflectore allow to shift the light from one room into any other in the same building, in whole or in part, with perfect accuracy and simplicity.

Thie introduces an element of great economy for household purposes. Were it not for this circumstance, every house lighted by our system would have to get a constant supply of light for every room and place to be lighted, whetber the places were in constant use or not; and as not all the rooms in a house are used at the same time, such an arrangement would be very wasteful, which is the case with all the other systems of electric lighting yet proposed.

2d.—Control of the Shape of Light.

The secondary lenses above mentioned will control by their shape and position the ehape of the light. If the light comes from tho ceiling and a diffusing lens is used, it will send down a cone of light extending all over the floor, for instance: if the curvature of the lens were different, said cone might be made wider, so as to illuminate the walls as high as desired, and the ceiling too; or it might be made narrower and the light be concentrated upon a work table, a sewing machine, a writing desk, etc. At present a room may be lighted with 1 or 2 gas burners of 15 candle power each; and yet, they often are insufficient to read or write by; either you have to get with chair and desk near the burner, or you have to use shades, reflectors, drop lights or some inferior kind of light upon your table. But, iu our system, by properly swinging the secondary lens, we can throw the cone of light to any desired place in the room where it is needed; and by this means, 8 or 10 candle power in our system will, iu most cases, he more serviceable than 15 or 30 candle power is with the present system of light, or in any of the electrical systems heretofore proposed. By the same means the cone of light may be thrown away from any place where it is not needed, as from a sick hedstead for instance.

This circumstance also increases the range of utility or adaptability of light to many especial purposes without expense or trouhle. Because hy using a proper lens we can project the whole amount of light into a point, if so needed, thus affording the microseopist, for instance, a powerful aid in his work. The physician also can perform medical operations and hody examinations at night with comfort and perfection. The engraver, the draughtsman, the watchmaker, in fine, all workers of delicate work can extend their operations at night with comfort and ecouomy; whilst by auy other system of lighting the amount of uncondensed light needed for eucb purposes would he too great to be economical; and if condensed by an additional artificial means, it would add extra expense and would never be so comfortable as in our system.

The best plan will be to furnish every house with a set of two to three different inter-changeable lenses for general purposes; and every individual may add the special lenses adapted to his work, his tastes or his needs.

3d.—Control of the Physical and Chemical Properties of Light.

We have only to intercept the heam or beams of light, before they reaeh the secondary lenses with shades of different colors, and of appropriated eubstsnces or media, and we will modify the properties of light at will, with ease and economy. This is invaluable for the treatment of ophthalmic diseases at home and in hospitals; it is of great service to photography, where lights of different colors and of differcnt actinic power are needed; it will aid many other industries in analogous ways; it will be a most powerful and fitting aid to theaters, where scenic effects of all kinds are needed.

Comparison with other Electrical Systems.

Let us compare now our system with the others. The first class of electric lighting has a very restricted, practical limitation hoth in its applications and its cost. It is very seldom that a very strong light can he utilized; being therefore necessary to produce electric lights of a not very large power, wbich increases more and more the expenses; and even then it cannot he used iu small spaces. On the other haud, all the systems of the second class of electric lighting, in which the electric current is divided, have two practical limitations. As the waste or loss of electricity increases with the numher of small lights, it is necessary to use a weak original current in order to decrease the numher of said lights; hence great expense of production. And if the production be made cheap by making the original current very powerful, then the number of subdivisions increasing, the loss and expense grow out of proportion. Iu both cases those methods are inapplicable.

Whereas our method, allowing the subdivision of light into any number of emaller lights and of any desired intensity, with a emall loss, that ie independent of the number of lighte, affords the opportunity to produce electric light in very large quantities, larger in fact than ever before attempted; it will therefore be much cheaper, and no other syetem can claim this advantage. Thie will make our method extremely cheap; and hesides it can be utilized or applied to all kinds of uses, from the highest requirements of modern industry to the most humhle of houeehold purposes.

The loss in our system is so small because it is independent of the number of the secondary lights produced: it is only due to the reflection of light, which can be reduced practically to only 8% for each reflection, using totally refracting prisms as reflectors. And ae in a city there will not be required more than six reflections or changes of direction, the total loss will never exceed in practice 50% of the original light, no matter in how many small lights the light is subdivided. But in the eecond class of electrical systems, the total loss far exceede 999% per thousand; and when the number of secondary lights increases, the total amount of light reaching destination is soon less than 1-100,000th of the original light. This single fact shows the immense superiority of our syetem upon any other yet proposed.

But this is not its only advantage.

When the current of electricity is divided, the secoudary currents must be independent of each other; otherwiee, when one of the lamps has to be extinguished, or its intensity varied, all the other currents and lights would also be altered; to obviate this, every secondary circuit has to be made of a constant resistance, which meane that whether a lamp is lighted or not, or whether its intensity is varied, the secondary circuit correeponding to it always spende a constant amount of electric current. This intro-

duces an element of great wastefulness. Moreover, the currents or circuits of each room in a house being independent of each other, they are wasted awsy, whether the room is in use or not. All of which is avoided in our system hy the shifting of light from place to place, as explained before. To put an instance, let us suppose a house having 15 places to be lighted, rooms and halls. Some rooms need sometimes 6 or 8 burners, some 4, some less: as an average such house will bave 30 or 35 burners, although not in constant use. By any of the other systems of electric lighting, that house needs a constant supply of electricity enough for said 30 or 35 burners; whilst in our system a constant supply of 12 or 15 burners will suffice for all purposes, because the light can always he shifted in any amount to the room where needed. This item alone gives to our system a saving of about 50% upon all the others.

Another consideration is that the systems with subdivided currents require every lamp to be connected to the general circuit by two conductors. The length of the circuit would soon attain hundreds of miles for a city; it has been estimated that the conductors needed to supply the city of Berlin with electric light by such systems would cost some $60,000,000. And all such expenses are avoided by our system.

Again, the number of electric lamps or regulators needed in such systems is excessive; which will greatly increase the expenses. The lamps, besides, require a great deal of attention and great expenditure of carbon points; and as they are delicate mechanisms, they are not fit to be used hy people in general, they are very liable to get out of order, producing expenses for repairs, and often depriving the consumers of their light; therefore they are expousive and uncomfortable. All of which is also avoided by our system.

Finally, we will observe that the electric light always produces a whistling noise, and that its intensely focal heat acts chemically in the air, giving out small quantities of nitrous acid and nitric acid, which are very poisonous. Both defects are unavoidable in any system of electric lighting except in ours. Ours also is the only system where the focus of light is kept away from the places where used, which affords the opportunity of saving to the consumers the trouble of attending to any machinery or electric regulator.

[Concluded Next Week.]

Tombstone District.

Surveyor-General John Wasson has just returned frnm a visit to Tombstone mining district, to the mill-sites on the San Pedro and to the southern and southeastern slopes of the Huachuca mountains. He says that the object of his visit was to notice the general characteristics of the sections of country named, as he had never before seen them. Although disposed to be a "bear" in mining matters, he says the Tombstone mines have never been as highly represented as their actual merits plainly justify, and that the owners of leading claims there have been absolutely modest in speaking of them. His time was limited to less than a whole day, and therefore only made a personal inspection of the Tough Nut, Contention and Lucky Cuss, and took a hasty glance at some others. The ore in sight in the mines named is immense, and of its richness the assayers all testify and the appearance of the ore indicates the accuracy of their testimony. Numerous assays are daily made from average samples taken from the faces of the shafts and tunnels as they are advanced by the miners. These assays are not made for selling or marketable purposes, hut to daily know the value of the ore and to ascertain any changes of the component parts that may occur. The results are not given to the public, hut it is clearly known that they average up in the hundreds and frequently reach thousands. There is a goodly proportion of gold in the ore generally. Night and day shifts of men are employed on the Lucky Cuss and Contention, and perhaps on the Tough Nut, but the latter claim has already been so well developed and has so much rich ore on the various dumps that a very small force of miners can supply a ten-stamp mill for years to come. The Tough Nut and Lucky Cuss have numerous cuts, tunnels and shafts, ranging from a few feet to 75 feet, and the Contention has two shafts 130 and 110 feet respectively, with a 250-foot tunnel and some crosscuts on the 110-foot level, and all the work is done in the exact order of permanent and economical development. These three mines are specially mentioned because they are the most developed, although many others have shafts and tunnels of various sizes up to 75 feet, and they exhibit the most satisfactory quantities and qualities of ore. Were this district in Nevada, California, Utah or Colorado, Mr. Wasson is convinced that 20,000 men and millions of capital would be invested before another year opens.—*Arizona Citizen.*

The Keely Motor.—So long a time has elapsed since anything was heard from Keely and his motor that most people had forgotten him, or concluded that he had given up in despair his attempts to "bridle" the new and powerful force which he claims to have discovered. The Philadelphia *Times*, however, says that during all these weeks and months Keely has been diligently at work building what he calls his "vibratory engine," which is to ntilize the new motor power, and is now engaged in "graduating" the engine, which peculiar process, he says, will enable him to intensify the action of the vapor.

Useful Information.

Hints on the Use of Plaster of Paris.

The plaster may he made to "set" very quickly by mixing it in warm water to which a little sulphate of potash has been added. Plaster-of-Paris casts, soaked in melted paraffine, may be readily cut or turned in a lathe. They may be rendered very hard and tough by soaking them in warm glue size until thoroughly saturated, and allowing them to dry.

Plaster of Paris mixed with equal parts of powdered pumice stone makes a fine mold for casting fusible metals; the same mixture is useful for encasing articles to be soldered or brazed.

Casts of plaster of Paris may be made to imitate fine bronzes hy giving them two or three coats of shellac varnish, and when dry applying a coat of mastic varnish, and dusting on fine bronze powder when the mastic varnish becomes sticky.

Rat-holes may be effectually stopped with broken glass and plaster of Paris.

The best method of mixing plaster of Paris is to sprinkle it into the water, using rather more water than is required for the batter; when the plaster settles pour off the surplus water and stir carefully. Air bubbles are avoided in this way.—*Boston Journal of Chemistry.*

Noiseless ware is a novelty in china-ware introduced by Mr. Vernon, of Scotland, and which is well spoken of hy the London *Pottery Gazette*. It consists in providing at the base of the article, or, in case of covers, under the rim, a groove, into which is riveted a strip of india-rubber. This strip is so formed that when run into the groove it fits tightly, and that part of it which projects beyond it effectually prevents the article from scratching any smooth substance on which it may be placed, insures the greatest quiet when the article is being moved about, and renders it less liable to that slipping from trays that now and then causes much grief at meal-time. At the Royal hotel, Glasgow, Mr. Vernon has placed on exhibition quite an elaborate selection of wares (dinner and tea services, toilet sets, etc.); and of particular interest is a display of shipping ware placed on a rolling table, the surface of which is partly plate-glass, partly finely-polished wood, and partly cloth. The table is set a-rocking, to imitate the conditions of a cabin table in a storm at sea, but the ware persistently refuses to budge. The value of this simple invention for ship crockery will be apparent.

Red Fire.—There are certain recipes which, though often published, are still continually called for; and among these is "red fire," so much used in fireworks, amateur theatricals, and the like. The following is commended as both safe and cheap: Take by weight one part of shellac and four of well-dried nitrate of strontia; mix thoroughly in an unpowdered condition; heat in a tin dish to the melting point of the shellac; after cooling, the semi-fused mass is to be pulverized. This is not expensive, is safe, without tendency to explode, and burns quietly, slowly, even when strewed on damp ground, and produces a very good effect. The mixture for red fire is usually composed of nitrate of strontia, chlorate of potash and sulphur; this frequently takes fire spontaneously, especially when flowers of sulphur and imperfectly dried nitrate of strontia are employed.—*Boston Journal of Chemistry.*

The Chinese subject the greater part of their porcelain to only one firing, first drying the pieces sufficiently in the air to prepare them for glazing. This plan they are able to pursue, because the nature of their material is such that it resists the entrance of water. Their glaze is much superior to any in use in the European potteries; but it requires the most intense degree of heat for its fusion, and considerable art is consequently required for the management of the fire, as well as in the construction of their ovens. These are built in the most substantial manner, so that when the fire is at its greatest hight the hand may be applied to the outside without any fear of burning.

The repeated applications in copper or brass, of alternate washes of dilute acetic acid and exposure to the fumes of ammonia, will give a very antique-looking green bronze; but a quick mode of producing a similar appearance is often desirable. To this end the articles may be immersed in a solution of one part of perchloride of iron in two parts of water. The tone assumed darkens with the length of immersion, or the articles may be boiled in a strong solution of nitrate of copper. Or, lastly, they may be immersed in a solution of two ounces nitrate of iron, and two ounces hyposulphate of soda in one pint of water. Washing, drying and burnishing complete the process.

A softer solder than is used for ordinary brass work is composed of equal parts of zinc and copper. A very hard but fusible solder is composed of two parts zinc and one part copper. This solder is so hard and brittle that it can be easily crumbled in a mortar when cold.

A glass manufactory in Hanover, Germany, makes glass which is a close imitation of marble, and tables and floor tiles which are pronounced preferable to marble on account of their extreme hardness.

Brine for the Preservation of Animal and Vegetable Matter.—M. Mercier, in the *Archives de Geneve*, recommends a solution of common salt for the preservation of zoological and botanical specimens for scientific purposes. It is cheaper than alcohol, does not evaporate, does not extract or alter the colors, and is not likely to be surreptitiously drunk. The brine is boiled to expel gas, and the specimens are immersed at about 80° C., and closed up. If the brine really answers the purpose, it will save a good deal of expense and trouble in museums.

Pocket Mucilage.—Boil one pound best white glue, and strain very clear; boil also four ounces isinglass, and mix the two together; place them in a warm hath (glue kettle) with one-half pound white sugar, and evaporate till the liquid is quite thick, when it is to be poured into molds, dried, and cut into pieces of convevient size. This immediately dissolves in water, and fastens paper very firmly.

A new European lubricant consists of an intimate mixture of tallow, black lead and melted india-rubber waste.

Good Health.

Ringworm.

Dr. John V. Shoemaker, in a paper read before the American Medical Association on "Ringworm in Public Institutions," states that, while treating a large number of cases of ringworm, which occurred in one of the public institutions for children in Philadelphia, he scraped some of the scales from the scalp of one of the children, and also from the chest of another, and applied them to the bodies of two cats. For three days no change was perceptible on the parts upon which the scales were placed; on the fourth a small meal-like patch was detected upon one, and on the other the hairs began to fall out. The fifth day the patches assumed the characteristic circular form, and the affection continued to spread rapidly until spots the size of a large coin were almost denuded of hair. Scales from the patches of one of the cats were reinoculated on a healthy portion of the scalp of one of the children and thigh of another, with the effect of producing the circumscribed spots of ringworm. Two specimens were now prepared, one from the inoculated child, the other from one of the cats, and revealed under the microscope fungi of a luxuriant growth, threads being present in large quantities.

Ringworm owes its origin to a vegetable parasite, the *Trichophyton tonsurans*. It generally commences among those that are improperly cared for, and, as it is exceedingly contagious, it spreads rapidly to those coming in contact with the infected. The fungus has a predeliction for the strumous and debilitated, and flourishes upon them luxuriantly.

Among the 50 cases afflicted on the occasion referred to the author found that a large percentage were the children of subjects of chronic disease, worthless and confirmed drunkards, and inmates of charitable institutions or almshouses. The affection frequently has its origin in the lower animals, and is transmitted from them to children and adults. A number of cases are on record in which it has been communicated directly from cows, calves, oxen, horses, and cats to individuals, and then to other members of the same family. A well-marked example of its direct transmission from a cow to an individual came under the author's notice and treatment a short time since. The experiments on cats, noted above, are also additional strong proof that the fungus can be transmitted from lower animals to children, and from individuals to animals, and also verify the fact that the scales of the scalp are capable of producing by inoculation ringworm on other parts of the body.

Dr. Shoemaker states that his observation has been that, when the affection attacks the body and is not complicated, it is easily cured; hut when it involves the head it is a most tedious and unmanageable disease, owing to the mischievous influence of the hair. He believes, however, that the failure to promptly eradicate the disease in the majority of cases in public institutions is due to negligence, want of patience, and the inability on the part of nurses and attendants to properly understand the orders of the physician.

Errors.—It is a popular sanitary error to think that the more a man eats the fatter and stronger he will become. To believe that the more hours children study, the faster they learn. To conclude that, if exercise is good, the more violent the more good is done. To imagine that every hour taken from sleep is an hour gained. To act on the presumption that the smallest room in the house is large enough to sleep in. To imagine that whatever remedy causes one to feel immediately better is good for the system, without regard to the ulterior effects. To eat without an appetite; or to continue after it has been satisfied, merely to gratify the taste.

It is said that the oil that exudes from orange peel when bent between the fingers, will check the progress of carbuncles in their incipient stage. Perhaps the oil may also be useful for other cutaneous eruptions.

Fish as Brain Food.

Since during the acts of sensation and intellection phosphorus is consumed in the brain and nervous system, there arises a necessity to restore the portions so consumed, or, as the popular expression is, to use brain food. Now, as every one knows, it is the property of phosphorus to shine in the dark, and as fish, in a certain stage of putrefactive decay, often emit light or become phosphorescent, it has been thought that this is due to the abundance of phosphorous their flesh contains, and hence they are eminently suitable for the nourishment of the nervous system, and are invaluable brain food. Under that idea many persons resort to a diet of fish, and persuade themselves that they derive advantage from it in an increased vividness of thought—a signal improvement in the reasoning powers. But the flesh of fish contains no excess of phosphorus, nor does its shining depend on that element. Decaying willow wood shines even more brilliantly than decaying fish. It may sometimes be discerned afar off at night. The shining in the two cases is due to the same cause—the oxidation of carbon, not of phosphorus, in organic substances containing perhaps not a perceptible trait of the latter element. Yet, surely no one found himself rising to a poetic fervor by tasting decaying willow wood, though it ought on these principles to be a better brain food than a much larger quantity of fish.—*Dr. J. W. Draper.*

How to Prevent Diseases among Children.

A correspondent of the New York *Times* says that he has followed a recommendation from a lady to evaporize a little carbolic acid daily in the heaters as a disinfectant and a preventive against contagious diseases, and the results have been most satisfactory: "I have a large school, and out of the whole number only two pupils have been sick with scarlet fever, and even these cases were indirect ones. In my own family, which consists of 14 children—fortunately not all my own—and five adults, not one has been afflicted with any malady, not even with a sore throat, for longer than a day or two. We certainly keep the house minutely clean, ventilate it thoroughly every day, and never heat the rooms above 66° Fah. During my 30 years' experience I have never seen the like."

We think it probable that the use of a small quantity of carbolic acid in the manner above mentioned may, in some cases, be beneficial. But if it were the golden rule in every family to keep the house minutely clean, ventilate it thoroughly every day, and never heat above 66° Fah., there would probably be little need of carbolic acid or any other drug.

Castile Soap.—The reason that castile soap is so extensively advised by physicians is because of its purity and freedom from alkali. In the manufacture of castile soap, vegetable oil is used instead of animal fat, and great care is taken to avoid an excess of the soda; only enough being used to take up or neutralize the oil. This soap, therefore, is mild and gentle, and can be used on irritated surfaces or wounds, where common soap would give pain, perhaps occasion injury. The mottled sorts of castile soap are made by the addition of a small quantity of sulphate of iron—copperas. This copperas in solution is stirred into the soap while in a fluid state. At first the color is bluish, on exposure to the air it changes to a red. This soap was called "castile," for the reason that it was largely made in the province in Spain so called. The largest amount, however, comes from the south of France, and in Europe this variety of soap is more generally known by the name of Marseilles than castile.

Difficulty of Breathing.—In cases of difficulty of breathing, the bystanders commonly raise the sufferer to a sitting position and allow the head to bend forward, and hy so doing, they increase the difficulty. Dr. B. Howard, in a communication to the Royal Medical and Chirurgical Society, points out that there is "an anatomical remedy against respiratory obstruction." This remedy is very simple, and may be described in one word—position. Raise the chest, and let the head hang back as far as may be. The effect of this position on the respiratory apparatus is described in anatomical detail by Dr. Howard; hut under all the words rests the simple fact, "that complete extension backward of the head and neck should be the first and instant measure in threatened or actual apnœa, both as a remedy and as the first step toward success in artificial respiration."

Warts.—The beginning of the growth of warts is due to obstruction which prevents the free action of the excretory organs. This obstruction produces a thickening of the tissue. The process is somewhat like that observable on trees. Owing to some injury, the bark becomes diseased or damaged, and the juice, or sap, hy its unnatural exposure to the atmosphere, undergoes a chemical change, and a growth is produced which becomes in time a mass of hardened tissue—a kind of fibrous or cellular tumor in the tree. One frequently sees these growths; their forms are much varied, and by no means conducive to the beauty of the tree. Careful treatment with chromic acid will remove warts.

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The Week.

The stock market, which has heen in a peculiarly depressed condition since the adoption of the new Constitution, has rallied somewhat in the last few days, and now appears firmer and more cheerful. There are few mining districts from which reports are not encouraging. Plumas is putting down shafts and extending tunnels; Shasta resonnds with a chorus of picks, sledges and the roar of hlasts; Nevada, Placer, and the other gravel districts, rejoicing in the agreement with the farmers that they shall he allowed to finish the year without restraint from the mining debris decision, seem revisited hy new energy and rich finds. In Oregon, the prospect is less hright, for in the southern part at least, the want of water is heginning to be seriously felt. Colorado continues to make the prospector happy, hut from many sides come grave whispers as to the depth aud permanency of her principal mines, and openly expressed fears that Leadville will prove hut another White Pine. Arizona, as usual, shows good progress, and Tombstone and Arivica must look to their laurels or they will he surpassed hy the California and Don Cahesas, while Santa Catarina and Comstock are not far hehind. Nevada is steadily moving on with the developments on the Comstock and the indications are good that the present stringers found will ere long devolop into permanent ore hodies. Paradise and Silver State districts are gladdening the prospector's heart, and, in fact, from every side, the happy and hopeful miner comes, confident and rejoicing in the greatness and certainty of the prospective fortune he has "monumented."

The work of surveying and locating the Northern Pacific railroad is to begin immediately at Astoria, Or.

About 1,200 cattle perished in Okanagan county, Or., last winter, hut there are over 10,000 left.

A Field for the Unemployed.

There is in this city at the p'sent time a large nnmhsr of men out of employment. The most of these are men who have heen accustomed to manual labor, though many of them have not, heing clerks, hook-keepers, etc., with a considershle sprinkling of young men who have just arrived at that age when they need and should have some sort of employment to enahle them to earn an honest livelihood. Then, hesides these men and lads, we have here a great many women and girls who are in want of and should have something nseful to do. The city does not and never can afford employment for all these people. Just now there is hut little huilding or other kinds of improvement going on. Business at our machine shops, mills and foundries, is slack, all our manufacturing and mechanical industries heing greatly depressed. Nor is it prohahle that we shall very soon experience a more active and prosperous condition of things. The city has rather outgrown its requirements and will have to stop and wait a little till its business and population overtake it.

But were San Francisco growing and her industries prosperous there would still he here a great surplus of working population, two-thirds of which should seek employment elsewhere. But where should they seek it? Why, in the country, of course—out on the grass and grain growing lands, in the mines, the fisheries, the forests—aloug all the grand avenues that there open to energetic, persistent, well directed enterprise. These nnemployed people ought to know this, for they have heen told of it a great many times. Indeed no pains or expense have heen spared to hring this knowledge home to them through the newspapers and other popular channels of intelligence. Books have heen puhlished, lectures delivered and pamphlets printed hy the million for the purpose of acquainting them with the opportunities, the grandeur and the resources of California. The Statc has heen so well advertised hoth at home and abroad that all, even the most ignorant, may he supposed to know much ahout her soil, climate, mineral and other forms of uatural wealth, and to duly appreciate the advantages she presents as an industrial field and place for settlement.

But how to avail themselves of these advantages is the question with these idle, inexperienced, short-handed and sometimes wholly impecunious persons. It is to little purpose we tell them ahout all this unappropriated wealth and these various openings for lahor if we cannot hy some useful suggestions help them to turn the same to practical account. And to do this is the hard part of the husiness. To expatiate on our resources and give advice of a general kind is all easy enough; hut to point out exactly what should he done and how to do it is another and more difficult matter—so difficult that it is with no little misgiving we venture a few hints on a suhject so environed with perplexity and douht.

In the first place it seems to us that those hranches of work that our women and girls can do as well, or nearly as well, as the men should he wholly given over to them, the men confining themselves to snch kinds of lahor as the opposite sex cannot so well perform. Under this arrangement a large, and what has heretofore heen the most helpless class of operatives, wonld he provided for. In a world where it is necessary and proper that all should work, one set of toilers should not he permitted to encroach upon the fit and natural labor sphere of another. This would he neither economical nor just. Even after so enlarging the province of woman it would, as compared with that of man, remain greatly restricted. In most countries it would, to he sure, work a present hardship, such ejection of the men from the various handicrafts and callings to which they had heen trained. But here, where we have so many rugged industries and such great extents of agricultural and mining lands open to all, such surrender could he considered hardly more than a temporary inconvenience. All the unemployed and illy-employed men in San Francisco might find opportunities for earning fair wages in the mines of this State, if only they could he placed there nnder the right conditions and would afterwards work with ordinary diligence. So also could these men do the same thing at farming, fruit growing or stock raising, once they had a start. But it requires a good deal more time and money to get started at either of these vocations than it does at mining, wherefore we shall in what we have to say in this connection confine ourselves to the latter subject.

It is now a long time, 20 years or more, since the whites hegan to leave the mines of California hecause they could no longer make the hig wages to which they had at first heen accustomed, the general impression heing that the pay diggings were ahout exhausted. And so, ahandoning the mines they scattered, some going elsewhere to prospect, and some engaging in other pursuits. Meantime, another people came in to occupy their places. During all these years a tide of Chinese has ehhed and flowed through the mines of California, there never having heen less than from 15,000 to 20,000 of this race at work in our placers. What their earnings may have heen no one knows: that they were satisfactory is evidenced hy their persistent labors and steadily increasing numhers. That the most of them have done well may he inferred from the fsct that great nnmhers of them have on leaving ths mines gone directly home to China. Their average sarnings have, no douht, heen much larger thsn has generally heen supposed.

And now the question arises how is it that the Chinese have heen ahle to live and thrive working mines so generally ahandoned hy the whites as heing too poor to sfford them living wages. In considering this question we do not, of course, overlook the fact that the Chinamsn can suhsist himself somewhat more cheaply than the white man, having at the ssms time no family to support nor puhlic duties to perform. But on the other haud he lahors under csrtain disadvantagss that more than offset these favoring conditions, leaving us to sesk elsewhere for the causes of his greater success, and which we are inclined to think will he found in his more systematic, intelligent and provident way of going ahout the business. The Chinaman who has determiued to engage in mining does not rush off to the diggings alone, illy outfitted and unadvised as to where he is going, or what he will he ahle to do aftsr reaching his destination. These people when they move go in squads, thoroughly organized, and acting in concert. In this manner they manage to economize time, freight, passage money and other expenses, while they act with more efficiency. In many instances these foreigners know hefore they leave home just where they are going on their arrival in California, having been posted as to the most eligihle mining localities hy there returning countrymen. There are here in San Francisco, various associations who take it upon themselves to collect information from all parts of the mines, and to secure properties therein, for which purpose they send agents to examine different districts, and to take up ground where they can find any unoccupied, and buy or lease such as has heen already located if suited to their purpose. In these cases they aim to get hold of extensive tracts, so that they can he worked hy large gangs of men. They prefer shallow placers, tailing deposits and river heds, which can he opened and worked at little expense, most of the outlay consisting of labor. In selecting these localities they evince much shrewdness and tact, as they afterwards display the greatest diligence and economy in working them. Their provisions, consisting largely of rice and other commodities imported from China, all cheap and simple, are purchased from their own countrymen, as are also most of their other supplies. Everything is hought at wholesale, and consequently at the lowest rates. Whether in the matter of living or outfitting their claims, they incur no expense that can he avoided. Hand is suhstituted for steam power, and rude water-driven wheels are made to perform the duties of costly ditches. Instead of log or hoard cahins, tents, and more often hough houses, serve for protection. Their cooking is done in a few large kettles set on stones, neither stoves nor fire-places heing required for this purpose. They sleep on mats in their ordinary clothes, and therefore need few hlankets. They work long hours and industriously, and so manage in the end to make money, sometimes even in very poor diggings.

In the foregoing we have the secret of the Chinaman's success as a miuer, and while it is not expected that the white man will have recourse to all these Mongolian methods or consent to live so nearly after the style of savages, it might be well for us to consider whether the superior race could not in the conduct of their mining affairs adopt something of John's system, economy and close calculation to advantage. To the extent of sending out experienced and capahle men to examine, choose and secure eligihle localities for mining operations and the ohservance of extreme caution in the matter of expenditure, we certainly might profit hy his example. If the unemployed men in this city and other places where lahor exists in excess of demaud, would adopt the plan of forming small companies and hy sending out a suitahle man or through other means ascertain where a good opening presented itself for engaging in mining, and then set ahout the business carefully and follow it up with persistence and industry, they would soon find their condition and prospects greatly improved. There are thousands of such places in this State, to say nothing of those that exist elsewhere. For many reasons, however, California is the hest country for men of small means to commence mining in. The ease with which the mines can he reached, the climate and the mineral-bearing deposits, heing, for the most part, placer and anriferons, recommend it to this class above any other part of the Pacific coast. Let our working people who are doing little or nothing consider these suggestions, and see if they cannot manage to get out into the mines and find or make openings where they can earn small wages at first, with a fair prospect of securing after a while employment and interests that will bring them a better reward. If properly undertaken we are sure this could he done, and hope to see some general movement entered upon looking to that end.

The Acme Mine.—We were shown this week a very rich specimen of ore from the Acme mine, Bodie, taken from a depth of 56 feet below the surface. They are now down 80 feet on the ledge and when they reach 100 feet they expect to commence crushing ore. Ore of the class shown in the specimen, which contained fine particles of native silver, will assay as high as $7,000 per ton, most of the value heing in gold.

The French cahinet talk of resuming relations with Mexico.

The Tributers and Coasters.

As the hnsiness of mining has progressed on this coast there has arissn a necessity for many new words and tsrms to give expression to the various forms the husiness has taken on and the novel practices that have grown up. To mest this want words wholly new have heen invented or others already in use have heen avsiled of, their original meaning having sometimes heen extended or slightly perverted to enahle them to hetter accomplish the end for which thsy were introducsd. Thongh to the stranger many of these terms may sound outre snd hsrharons, the California ear has become reconciled to their use and we all rscognize their good standing in the vernscular tongue. The *prospector* the *stampeder*, the *coaster* and ths *tributer* are all understood to he men and not *wild animals*. They helong to the various corps of the mining army, and if we did not designate them hy these we would hardly know hy what other names to call them. While the meaning of the first two of thess terms is too well understood to require the services of an interpreter, the other two, heing less familiar, may he the hetter for a little explanation.

The coaster is a person who frequents abandoned or neglected mines, and rummaging ahout gouges out any hits of good ore that may have been left in the deserted drifte and stopings, though not always over scrupulous as to how or where he prosecutes his calling. He is to he regarded not so much a freehooter as a gleaner, who goes over the stuhhle field gathering up what has heen left and would otherwise he lost. The coaster does not confine his operations to underground workings, hut visits old ore dumps and overhauling them picks ont and appropriates any fragments of good looking ore that his eye may happen to light upon, and he has a quick eye to their detection. This fraternity is made up lsrgely of Mexicans, and others of like easy going hahits; men who dislike steady hard work, hut bestir themselves where there is a chance of good pay, liking the husiness none the less if it happen to he slightly tinged with the surreptitious. Many a goodly nugget and arroha of rich ore in days agone have these fellows secured from the waste dumps along the Comstock. A few of them reaped a harvest too from the vacated shafts of Esmeralda, when that district was so hastily and prematurely relegated to a condition of desolation and vacancy. More or less of this gouging, cleauing-up sort of work has heen practiced in all the old and nearly deserted mining camps in the country; the overhauling of the waste ore dumps being common wherever their owners will permit it. Why men engaged in this style of ore gathering should have heen called coasters is not quite clear. A coaster in nautical phrase is a vessel employed running from port to port, keeping near shore, being in this distinguished from crafts that voyage across the ocean. In that the coaster carries on a more restricted and irregular trade than the deep sea-going craft—the term as applied to this school of miners has some fitness and significance, though it is manifestly lackiug in the appropriateness that marks most words helonging to the class under consideration.

The word trihute is not new as applied to a certain class of miners, the extraction of ore hy the tribute system having long hsen in vogue in older countries. The plan heing, however, of recent introduction here, calls for some explanation, the meaning of the term as used in this connection, having heen moreover entirely perverted from its usual acceptation.

A trihuter is a miner who, working a section of the lode assigned to him, receives instead of wages a certain percentage of the ore extracted or of the metal made from it. In the *Stock Report* of recent date we find such a good description of this system and its mode of operation in onr home mines that we give here the main facts set forth in that paper.

A good deal of the ore reduced in the Manhattan mill at Austin, Nevada, is extracted from the company's mines on trihute. In proceeding with this husiness, the company, from surveys made and for other reasons, having good cause to suppose that an ore hody exists at a certain poiut in one or more of their lodes, enters into a contract with a party of miners who agree to go on and perform the work necessary to open up the ground and extract the ore for ten per cent. of the net prodncts of hullion, the company furnishing tools, timhers and supplies, and doing the hoisting and removing the waste. They also haul the ore to mill and reduce it. As only the net products are divided with the miners, it is to the interest of the company that this should he reduced to a minimum, an end thatis reached through the establishment of pretty steep charges for milling and a liberal margin allowed for discount on hullion and loss in actual working. The miner gets his ten per cent. of the net product, hut the latter is hy the above process reduced as low as possihle. To illustrate the workings of this system a little more in detail, let us suppose the miners take out ten tons of ore which are sent to the mill and crushed. The company assay the pulp, agreeing to return 80% of the assay value; they next deduct 18% or something like that, for hullion discount; then $35 per t n is charged for milling, and, finally, a modicum added for taxes, after which they are ready to divide what is left on the hasis agreed upon, with the miner, who, despite this depleting method, generally realizes hetter pay nnder this system then when he works for wages.

American Gauging and Measuring Implements.—No. 2.

We continue on this page the showing, which was begun in our last issue, of the progress made in this country in the manufacture of measuring machines and standard gauges. Again we shall quote from the paper read before the Franklin Institute by J. Richards, of the firm of Richards, Haod & Taylor, proprietors of the American Standard Gauge and Tool Works, Philadelphia:

Fig. 1 is what is called a calipering machine, nsed for traosmitting sizes, but not for measuring beyond a degree of accuracy which the pitch of a carefully made screw may give. Such machines are employed io making gauges, reamers, drills, mandrils, taps and so on. Being inflexible, or nearly so, the accuracy is greater than in using common calipers, but the main difference and that which gives most value to snch machines, is that they indicate as the size is approached and also variations above or below standard size by 1-10,000 of an inch. A workman using such a machine has no dread of spoiling his work. He can make a loose fit, a shrinking fit, or a forced fit, as may be required. The value of such a machine in a fitting shop was never conjectnred until one was made and put into nse at the gange works. At first it was intended for nse only in grinding mandrils or gauges, bnt soon became an implement of general nse. A workman would finish a piece of turned work to 5-1,000 or 10-1,000 of an inch in diameter without losing auy time. Seeing the valne of snch a machine, especially for the tool rooms of large machine shops, and also requiring more of them in the gauge works, a smaller and cheaper machine, measuring to four inches, was prepared.

This machine as shown io Fig. 2 is arranged with divisions at one eod for the 1-5,000 of an inch, and at the other end for the 1-3,200 of an inch. The same machine can be adjusted for measuring, if deeired, the index points being shaped to correct irregularities of the screws. The makers incline to the opinion that machines of this kind will come into general use, and are experimenting on various modifications to perfect and cheapen them. With this much in respect to the machines employed in gauge-making, it will be next in place to describe some of the implements produced.

It wae noticed in various shops that, whether provided with cyliodrical gaugee or not, fixed calipers were the implemeots in use, in other words, were the working tools, and it was resolved to make these a base, as it were, for ganging, reversing the old eystem, which would procure the most expensive ganges for reference, aod then go downward to calipers and other tools; nevertheless a set of calipers with some means to keep them in adjustmeot forms a tolerably complete equipment to maintain sizes in a machine shop. There are, in such a case, hot few, if any, tools not in practical use, while the original cost is only a fourth to a third as much as under the old system.

After various experiments with molded steel, it was found to be suitable for calipers. When prepared for the purpose, it would harden the same as cast eteel and, when carefully treated, was free from inherent strains. Several differeot forms were tried, the result being finally to adopt the one shown in Fig. 3.

To keep these calipers in adjustment there are fnrnished what are called corrective gauges, in the usnal form in Fig. 4. These gauges are like what are called etep ganges in appearance, hut are made on a wholly different plan. The disce or plates composing the sizes are iodependent and ground separately to size, the same as cylindrical ganges; they are mounted on a epindle or holt, which holds them together, but permits their being turned around. These discs ars made of iron or steel, and can be hardened if required; for ordinary cases, however, hardening is of no importance, and adde considerahly to the expense of preparing them. The limite of accuracy to which these gauges are made are 1-5,000, 1-10,000, and 1-25,000 of an inch, the expense rising with the degree of accuracy, but not in the same proportion.

The sizes are usually from ¼ to 2½ inches by sixteenths, and from 2½ to 4 inches by eights of an inch, making 49 eizes, which can be mounted in an iron case, as ehown, and be kept in the hands of a manager or foreman, who can at pleasure inspect and test the calipers in use.

If aoy wear or derangement exists, a caliper can bs corrected by a careful blow on the outer or inner edge, as the case may be, requiring but a moment'e time, and but little skill after a few experiments.

Fig. 5 shows a kind of fixed calipers, made of eteel or white iron; the latter is recommended for rough use, being extremely hard throughout, and not liable to derangement by wear or accident. Pins and collars, which seem to be the most expensive and difficult kind of gauges to make, are by no meane so if, as before mentioned, time ie not taken into account. The pins are first made and the collars lapped out to fit; but by this remark it must not be inferred that the pins are ground to size by common emery wheels and io an ordinary grinding machine. Speaking for ordinary practice, this is not the case, because neither the naturs of grinding wheels or the movements for traversing, have been found perfect enough to finish pins to eize, and thers is good anthority for saying that nnns havs been finished in this manner in England.

The fixed calipers, whicb seem to be the most simple to make, are nevertheless ths most difficult, and require more implements and processes than anything clss. They are more snbject to change from temperatnre, and a portion of the grinding for adjustment has to be done on the faces of wheels, an operation which is in all cases extremely difficult, even if accurate results ars not required. The great variation of temperatnrs betweeo winter and summer is a considerable difficulty in gauge-making in this coutry. The lower temperaturo of winter can of course be controlled by artificial warming,

FIG. 1.

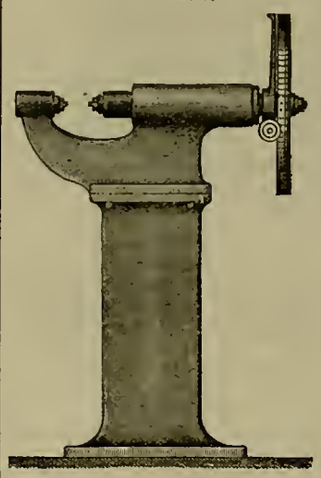
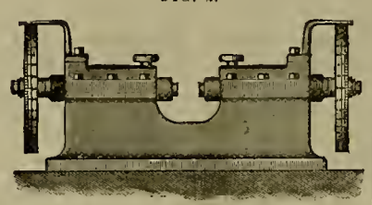


FIG. 2.



TWO FORMS OF CALIPERING MACHINES.

but the heat of snmmer is not so easily provided agaiost; so that io assuming a scale of temperature, 70° has been adopted at the Standards Department in Washington, and the measuring machiue, Fig. 3, has been adjusted at that temperature. In Eogland 62° is the common standard, while in Northern Europe a lower scale is common.

The Mountain Telegraph During Storms

Speaking of the difficultiee attending the keeping of the mountain division of the overland telegraph in working order, the Truckee *Republican* of a recent date says: The railroad telegraph wires cross the eummit in addition to those of the Western Union. During heavy storms, when trees are falling, landslides bearing away telegraph poles, aod avalanches sweepiog sections of snow-sheds into

FIG. 5.

FIG. 4.

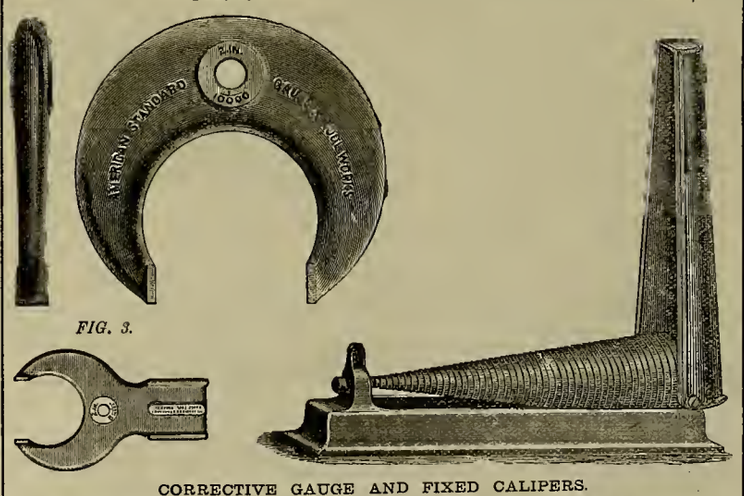


FIG. 3.

CORRECTIVE GAUGE AND FIXED CALIPERS.

the depths of the canyon, it becomes a matter of great difficulty to manage the telegraphic department. Between Summit and Alta, line No. 5 may be broken, and between Summit and Truckee, lines 5 and 6 may both be down. By a simple arrangement of telegraphic switches, No. 5 is connected with No. 6 between Alta and Summit, and with No. 7 between Summit and Truckee. By this ingenious syetem it is possible for a eingle dispatch to travel on each of the ten wires during some portion of its transit from Sacramento to Reno. In very violent etorms it not unfrequently requires the entire number of wires to make the equivalent of a single wire on the Sacramento division. A thoroughly disciplined corps of experienced telegraph repairere are constantly on the alert at the various stations on the Sierras, to detect and repair broken wires. Yet so fierce and furioue are the winter hurricanes and snow storms, that but for the system of switching wires, telegraphic communicatioo would frequently be impossible.

During April, 23,672 oubic feet of the etone embankment of the second section of the ssa wall were filled in.

Arizona.—No. 4.

[Written for the Press by W. H. S.]

Prescott, Phœnix and Maricopa.

Prescott is located up among the pioes, at an elevation of about 6,000 feet—has a good climate, good water, men of enterprise and brains, livo newspapers, churches, a first-class school, library, dramatic club, theater and good society. Fort Whipple, the beadquarters of Gen. O. B. Wilcox, Commaoder of the Department of Arizona, is only a mile from the town, aod the officers there, by their weekly receptions, serve to onliven aod brighteu society.

It was a wise thing, no doubt, so far as human foresight could forecast the future, to locato the capital of the Territory here, but railroads make great innovations, being often instrumental in destroying as well as building up towns. Yuma, from a place of impertance aod large business, has become a mere way station, so Prescott, notwithstanding its desirable locatioo, the eoergy and thrift of her people, will undoubtedly ccase to be the capital, and but the heat of snmmer is not so easily provided agaiost; so that io assuming a scale of temperature, 70° has been adopted at the Standards Department in Washington, and the measuring machiue, Fig. 3, has been adjusted at that temperature. In Eogland 62° is the common standard, while in Northern Europe a lower scale is common.

the trade of the Bradshaws will naturally go south to the railroad.

North, there is a large extent of mioeral country which will be developed in the near fnture, and within a radius of 20 miles there are several upland grase and agricultural valleys, notably those of the Agua Fria, Skull, Kirkland, and Pceples, all of which will, in ordinary seasons, produce crone of grain, vegetables and hay. These will contribute to make Prescott in the future what it has been in the past, a place of considerable importance.

One of the most important local industries is the manufacture of lumber. This suffers somewhat from the loss of that portion of the trade which now goes to the Valley of the Salt, and Gila, as this section will hereafter be supplied from the railroad.

About 10 miles south of Prescott there is a wide sweep of valley land which, in its desolateness, forcibly reminds one of the sea. It is well named "Lonesome Valley," for not a liviug creature was to be seen upon its many thouss nd acres. It is covered with thin grass, and would make good agricultural land were it not for the total abeence of water. A flowing well here would be more valuable than an ordinary gold mine.

Eighteen miles south of Prescott, in the valley of the Agua Fria, is the fioe grass and stock ranch of Nathan B. Bowers, Esq. This locality is peculiarly interesting, as upon this ranch, and in the immediate neighborhood, are found many ruins and other evidences of the ancient peoplo who once occupied these valleys. The massive walls of Mr. Bowers house are built of stones taken from one of these ruins, portions of which still remain near by. A short distance away there is what appears to be an ancient burial place. The graves, if such they be, are covered with flat stones laid in a circle, raised but little above the ground and about four feet across. Over 500 of these mounds have beeo counted in a space of about an acre. Who were these ancient people and when did they occupy this land? Mr. Bowers says that in excavating he has nncovered their floors, which were made of earth ponnded hard and smooth, and that wherever he has come upou any of their household utensils, consisting of the metate in which they ground their corn and pottery of various sizes and styles, he has invariably found them broken in pieces, leading him to the conclusion that the inhabitants had been forcibly driven from their homes by an eoemy, and their rude furniture destroyed.

One hundred and ten miles south of Prescott, on the Salt river, is situated the flourishing town of Phœnix. A new impetus has recently been giveu to businces here by the completion of the S. P. R. R. to Maricopa. The town is located in the midst of a wide plain or valley made fertile by irrigatioo, the water for that purpose being taken from the river, and it is said that there are a hundred thousaod acres in graio this year, mostly wheat aud barley. Dr. Jones, a gentlemao of wealth and enterprise, is experimenting with sugar caoe, having put in a large number of acres and with proper handling will bo sure to get a good crop. Here is a field in which some of the colored labor from the cane fields of Louisiana, now eeeking new homes, could find profitable and congenial employment. Phœoix is ambitious to become the future capital of the Territory. It is centrally located, and its importance will be largely increased by the building of a branch railroad, now io contemplation, from the S. P. R. R. at Maricopa, a distance of about 30 miles, over a country faverable for such construction. The town is flat, the drainage is on the surface, it is extremely hot in summer, and, unless its sanitary condition is well looked after, it will become, with a population of 4,000 or 5,000 people, very unhealthy. New buildings are going up, mostly of adobe; a baok has been opened; the price of lots is advancing; and there is an air of expectancy about the place indicating an appreciation of the new order of things about to be inaugurated by the iocoming of new people and the development of new enterprises.

Ten miles up the Salt, where the stage road from Phœnix to Maricopa crosses the river, is situated the fine ranch and flourishing mill of the Hon. Chas. T. Hayden. The mill is run by water power, having 24 feet fall. He also has a store here, postoffice, stage station, corrals, freight teams and a small army of Mexican and Indian retainers; broad fields of waving grain and herds of cattle, making him a veritable patriarch.

The new railroad town of Maricopa, the central and general distributing depot for middle and northern Arizona, is rather pleasantly located on a gentle rise in the desert near the Santa Cruz river, which is here a subterranean stream. It is flanked on either side by short ranges of mountains, aod between these, in a gap several miles wide, the railroad comes in from the west. Toward the east the wide illimitable desert spreads out as far as the eye can reach, broken here and there by isolated mountain peaks of bare and reddish rock, which lift up their jagged and serrated ridges out of the plain in many odd and curious shapes that glow with fervent heat in the noonday sun, and put on the most wooderful shades of color in the early dawn and evening twilight.

Here, where but a few weeks ago, the silence of the desert was unbroken by any sign of life or habitation, there is now an active, bustling town of more than 500 people, with postoffice, express office, stage office, stores, hotels, saloons, and new buildings going up on every side. The dust of the plain whirls itself in eddies above the ponderous freight teams as they come and go, bearing the products of many lands to distant mining camps and mountain towns. Maricopa is about 30 miles south of Phœnix, 140 south of Prescott, 170 east of Yuma, 50 west of Florence, about 100 northwest of Tuscon and 890 from San Francisco. It will be the distributing point for Florence, the valley of the Gila and the Globe mining district, east, Phœnix, the valley of the Salt, the miuing camps in the Bradshaw range, and to some extent, Prescott, in the north. It will have more permaneocy than most railroad towns, and contiuue a place of business importaoce until a branch railroad is built to Phœoix, when most of its business will be transferred there, aod that place will then become the distributing point for a still wider range of country.

Leadville Stock Exchange.—Sixteen enterprising business men of Leadville, Col., have recently organized a stock hoard, for the furtherance of real estate and miniog interests in that locality. It is to be called the Leadville Stock and Mining Exchange Association, and is making strenuous efforts to put itself in readiness for business by the 15th instant. Rooms have been furnished at the Clarendon hotel, a constitution adoptcd, permanent officers elected, and arrangements made with the Western Union Telegraph Company for obtaining the daily stock reports from New York and San Francisco. The officers for the ensuing year are as follows: Mr. H. A. W. Tabor, President; Mr. H. L. Swords, Secretary, and Messrs. H. A. W. Tabor, L. J. Smith, A. P. W. Skioner, John Kerr, Geo. A. Hinds, Joho Stewart and John W. Zollars, Directors. The exchange has now 47 members, all of whom are stated to be representative mining men of Leadville.

The Indians on Flathead reservation, Montana, are richer than the neighboring whites, cultivating their own farms and raising their own cattle.

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To Hydraulic Miners.

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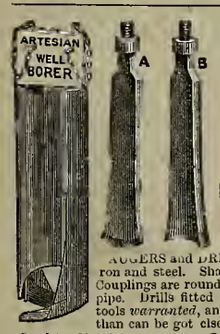
Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.
Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

HENRY C. PERKINS,

North Bloomfield, Nevada Co., Cal., October 1st, 1878.



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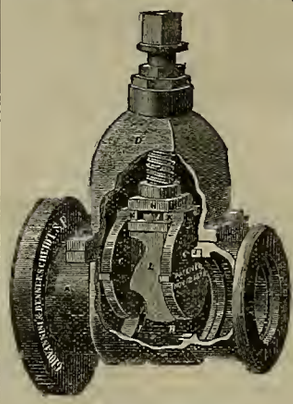

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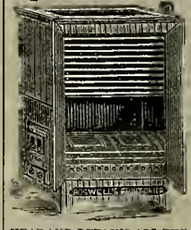

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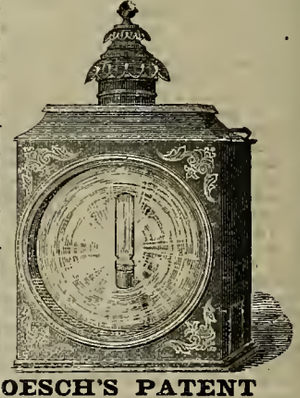

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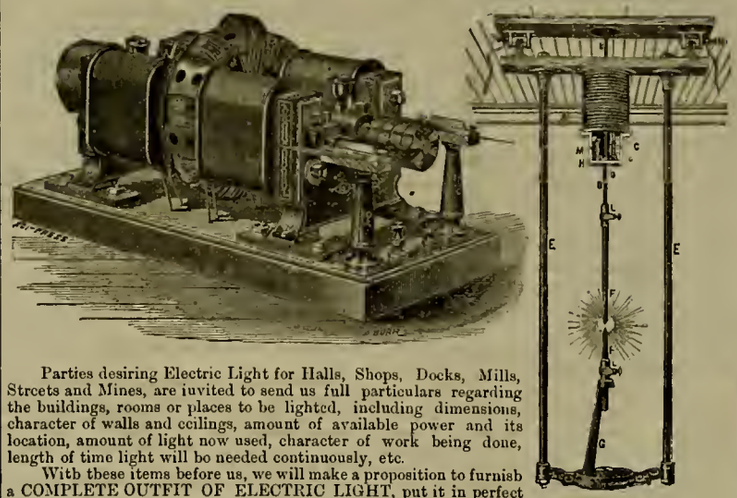

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Continued from page 317.

the quartzite footwall. No material change to note. They are getting some very rich ore from near the surface of the south shaft, the old Hamburg shaft and from just above the end of the south drift on the 250 level.

FOURTH OF JULY.—During the week work throughout the mine has progressed as usual. About 50 ft above the lower tunnel they discovered quite an extensive cave, the bottom of which shows some very rich ore. They commenced shipping ore to the Richmond furnace on the 1st instant.

PARADISE DISTRICT.

MINING ITEMS.—*Silver State*, May 12: A prospector named B. H. Davis has discovered rich ore about 75 miles south west of Paradise. The Arthur Con. has a 4-ft vein of ore, which averages $50 per ton, in silver. The Arthur is supposed to be a continuation of the Big Prize. Messrs. Torrey and Ryan, principal owners of the Gulch mine, are developing a valuable piece of mining property. It is being prospected by both tunnel and shaft. The ledge is about three ft wide, and carries considerable horn and native silver, and some black sulphurets. Judge Harlan and Mr. Merchant have just returned from a visit to the Giant mine. Judge Harlan, a first-class assayer, states that samples brought in will assay over 40% copper and about $30 in silver.

SILVER STATE DISTRICT.

GENERAL NOTES.—*Silver State*, May 12: This district is situated in a range of mountains which rune north and south, parallel with the Winnemucca and Paradise range. Mineral-bearing viens have been discovered in three places, several miles apart, in the district. The central mines, comprising the Silver Bill, Blue Bell, Blue Jay, Evening Star, Flora Bell, Chloride and several other locations, are situated in Lewis hill. The ledges crop out boldly, and can be traced a considerable distance on the surface. An incline shaft, some 25 or 30 ft deep was sunk on the Blue Bell, by Col. Buel, who leased the location from the owners. The ore extracted was shipped to Winnemucca, but in consequence of a cave in the shaft, work has been suspended for the preeent. Two enterprising minere, Messrs. Bradley & Hunter, have leased the Blue Jay, and are extracting ore from the croppings, which is rich beyond all doubt. Some of this ore assorted and sacked for shipment, is expected to mill from $300 to $1,200 per ton. Nearly all the croppings contain more or less rich ore, but there is not sufficient work done to determine the value of any of the claims. About six miles north of Lewis hill, Messrs. Cook, Glidden & Rodda, are at work on the Rodda ledge, and four miles south of Lewis hill, Zack King and two or three others are at work. Mineral-bearing quartz is said to abound in the range, north and south, a distance of 20 miles or more, but no work of any consequence has been done anywhere in the district, or in the range, the greater part of which is yet unprospected.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt*, May 8: The Cox & Coplin mine, if not already sold, will be taken at the figures named in the bond. It has developed richer ore and more of it than it showed at the date of the agreement of sale A gentleman who has some experience in mines was recently down in the Metamora, and expressed himself well pleased with the indications, and gives it as his opinion that it will develop into a valuable mine. The shaft is down 205 ft, at which depth water has appeared, which will necessitate proper machinery before going further. A crosscut has been run from the bottom of the shaft, and gives a distance between walle of eight ft and eight inches, and shows ore distributed throughout which gives good assays. Messrs. Riggs, Campbell and Newland, owners of the La Plata mine, Richmond basin, are down on the main ledge 55 ft, and have a vein carrying ore from wall to wall, seven ft. The ore is principally sulphurets, with native and ruby silver, and is similar in character to the King ore.

SAN XAVIER.—*Star*, May 10: Work on the San Xavier mines is progressing at a rapid rate. Enough men are employed to run both night and day shifts, and but few mines in Arizona can show an amount of development equal to these. One shaft is already down to a depth of 115 ft, and has drifts aggregating about 80 ft. This is called the "C" shaft, and is in mineral its entire depth, the vein at the bottom being 39 ft in width. On the dump at the mouth of this shaft are about 1,100 tons of ore. The "Union," or working shaft, is on the line dividing the Calabrasas and San Xavier property, and has already reached a depth of 100 ft. It is boarded or cased from top to bottom, the intention being to ultimately put in a hoisting cage. The third shaft has reached a depth of about 90 ft, and in its course has discovered some very rich ore bodies.

COLORADO.

KOKOMO.—Georgetown *Courier*, May 8: The Wheel of Fortune looks splendid, having a vein of ore from 6 to 19 ft thick. The ore is principally galena, with iron and copper pyrites mixed in it. The vein is very uneven and bunchy, and not at all like the Leadville deposits. Eddy & James, of Leadville, who have purchased the ore from this mine, claim that it is worth, delivered at the mill in Leadville, about $200 per ton. The mine is producing a large amount of ore, which is now piled up at the mine awaiting transportation facilities The Robinson mine has a vein from three to six ft thick, with the general characteristics of the Wheel of Fortune ore, except the grade is somewhat better. The ore purchased from this mine is worth, net, delivered in Leadville, about $250 per ton. Some fine specimens of carbonate ore have come from a claim above timber line, on Jack mountain, which belongs to one of the Keen boys. The vein is said to be 14 inches thick and assays from 40 to 150 ounces per ton. This is the only true carbonate ore in Ten Mile. Several very large veins of galena ore were discovered on Elk mountain lately, one of which is said to be 12 ft thick.

OREGON.

GOLD NOTES.—*Sentinel*, May 7: Nine German prospectors have returned from Silver creek, where they cached their provisions intending to return. They say the water is yet too high for successful mining. John Bolt still busy in Farris gulch, with plenty of water and better prospects for a larger clean-up than last year. J. T. Layton is running his pipe continuously in the same gulch. Mr. Frank Ennis, who has just returned from the English company's claim on Galice creek, states that a large amount of dirt has been washed, and that there will be sufficient water for a month's piping. Blue Gravel has been well worked this spring, a large amount of dirt having been moved. The gravel is looking very favorable for good pay and piping will probably be continued during this month. The claim of Lodge & McDonald, on "Jackass," will not be cleaned up this season, a cave having covered up all the washed ground just when the water failed, and it was impossible to wash it out. Their dust, however, will be perfectly safe. Mr. Dimick, of Dry diggings, is now engaged in cleaning up after the spring run. On Saturday he took one pan of dirt from the ground sluice and panned out four ounces of dust. The remainder of the ground sluice is apparently quite as good. George and Daniel Green are running two arastras steadily at their ledge on Galice creek. Their rock is averaging $30 per ton, with a large supply in sight. Water at the Centennial is failing, but the company struck their best pay just before the supply began to fail. A "Little Giant" will be put in operation next winter. The Applegate company is still pushing work on their ditch. The ditch, five miles in length, will be full of water by the 10th inst., but it will probably be three weeks before piping can be commenced.

THE recent rise in freights between Portland and San Francisco caused by the loss of the *Republic*, lowered the price of wheat at Walla Walla from 50 to 46 cents.

Now for the Results.

The proposed new Constitution was adopted at the election of May 7th by about 10,000 majority. The campaign for and against the instrument was full of excited discussion and the election was hotly contested. No recent issue in public affairs has stirred the people so deeply, and the result in a strife, where each side was fully awake and at work, cannot be regarded as otherwise than an expression of the unyielding determination of the people to put the new organic law into effect, hoping to reap therefrom many advantages. Thus we trust the future may prove.

The adoption of the new Constitution is one step in the course of affairs now in progress. It is not the end of the exciting series of events: it is rather the beginning. Just at this moment, as the popular mind and thought are resting from the excitement of the last two months, and before the excitements attendant upon the fall's elections begin, we have a few words of a general nature to express.

It is a hopeful sign, that, even though the direst evils were anticipated by the opponents of the new Constitution before the election, since the issue has been settled the disposition of all is to accept the popular verdict and take an earnest hold to realize all the good which the situation can afford. The confidence in the future of the State and the continued prosperity of the people, is unshaken even among those who prophesied greatest evils. Both those who regarded the new instrument as the ægis of a better and truer industrial future, and those who feared it as a harbinger of evil, are now striking hands in true patriotism and citizenship and agreeing, one with another, to labor toward the attainment of the greatest public good which may be found possible under the new order of affairs. This is a sign of a true heart and purpose, although opinions of means and measures were at variance; and this is the surety of success in all popular governments.

We have said the adoption of the new Constitution is but the beginning of the end. Much, indeed, depends upon the events of the coming months and the manner in which the people address themselves to the discharge of the new duties which the new order imputes. In the first place there will be needed, among all well-minded citizens, a spirit of true conservatism to check the too radical tendencies which are cropping out and which plume themselves for flights which the present expression of the popular will does not warrant. Another genius of good which should be generally invoked is the spirit of moderation. Half the promising deeds in this world are ruined by overdoing. As the clash of interests, endeavoring to readjust themselves under the new order of affairs, is in progress, there will be many occasions for the exercise of the sublime principle of the Golden Rule. There will also be many chances for the vengeful work of spite, but he is not a friend of humanity nor of the State who allows his actions to be prompted by narrow, selfish aims. The time demands the broadest charity, the deepest, truest philanthropy from all of us.

But there is a special demand of this time upon which will rest nearly all the good or all the evil of our immediate future. The people have declared the principles which shall govern them; now men must be chosen to give these principles application in the form of laws, and execution in the acts of public officers. It is *men*, therefore, which the exigency of the time demands; men of unimpeachable integrity, of sound judgment, of correct views, of unyielding principle, of solid, practical sense and wisdom. If the coming elections shall give us these, there is little doubt but that our new life will be a better life, and that the decisive step which has just been so decisively taken will be a step in advance—the entrance to an era of general prosperity, better than any prosperity we have hitherto enjoyed. Let us then urge upon all our readers this great need of the time, and beseech them to relax no exertion which promises to secure to the State the faithful servants which her exigencies require. We cannot follow our friends into the several organizations which they will form to express their views by the aid of party machinery and methods, but, now, standing upon the verge of the contest we can well exhort all to make their standards of requirements in the men they shall nominate for office, very high and exacting. Let no man's aspirations mislead anyone, rather seek out those who are well fitted to discharge the high and important duty which just now presses.

If this safeguard be assured, the future will be safe. Just as any system of government may be made oppressive by placing the power in the hands of designing and unscrupulous men, so may the new regime in this State be made oppressive by the same agencies if they be permitted to succeed. As the issue which culminated May 7th awakened the keenest interest and secured independent action on the part of the great industrial masses of the State, so let the coming events receive their fullest watchfulness and most patriotic effort. Take nothing for granted. "Prove all things; hold fast that which is good," is the principle which should prevail in the choice of men for the people's representatives. It would be time well spent if the chief thought of the people during the next three months should be centered on this great need of the State. Let our disposition be that which Cicero described as characteristic of the best days of the Roman republic, in that it was the unceasing care of the citizens that the State should receive no detriment.

News in Brief.

INDIA is recovering from the cholera.

THE jury in the Duncan case disagreed.

RENO is to have a large woolen manufactory.

THE Chinese are being whipped in Kashgar.

VIRGINIA CITY had a snow storm on the 11th.

THE price of wheat is still rising in Spain.

KENTUCKY desires the return of the whipping post.

THE grasshoppers have invaded Washoe county.

SHEEP-SHEARING is in progress in southern Oregon.

WATER has already failed in many Oregon claims.

THIEVES have stolen a saw-mill in Fulton county, Pa.

YAKOOB KHAN has accepted all the British proposals.

A GERMAN gunboat also is to be stationed in Chilean waters.

THE President has vetoed the Military Interference bill.

THE honey crop of southern California will be small this year.

TIMBER is suffering from forest fires around Scranton, Penn.

CHEYENNE sentences convicted tramps to six months at hard labor.

FROM 9,000 to 10,000 gallons of brandy are in store at St. Helena.

A CHINESE legation is to be permanently established at Madrid.

SAN LUIS OBISPO has a potato weighing over eight pounds and a quarter.

A SEVERE frost has injured the tender vegetation in Santa Clara valley.

NEAR Parma, Italy, 15 farm houses have been destroyed by a land slide.

THE threatened white raid on Indian Territory has nearly come to an end.

LAST year, 51,592 Ohioans were married and 1,097 divorces were granted.

THE lumber business in Mendocino county looks somewhat discouraging.

MOHAMMEDANS are plundering the shops in Adrianople on account of hunger.

THE proposed Woodruff Scientific expedition has collapsed for want of funds.

INDIAN AGENT MILROY has granted two divorces on the Puyallup reservation.

SWIMMING is a requirement with all candidates for the English naval service.

THE rigor of the last winter has largely increased the number of beggers in Paris.

FROSTS have destroyed the prospects of a good fruit crop in Honey Lake valley, Nev.

THE late rains have made good feed in the foothills on White river, Tulare county.

WOODEN water pips manufactured on Puget sound is constantly shipped to California.

THE British War office calls for 1,200 volunteers from the regular army, for the Cape.

FISHERMEN on the Sacramento report the run of salmon much better this year than last.

THE volunteer hay crop on the river lands in Napa county averages five tons to the acre.

THE bees in the burnt district of the Cahuenga mountains are dying off very fast with dysentery.

SAN JOSE Chinamen have built an impregnable gambling house, and now defy conviction under the law.

THE wool market in northern California is becoming more active. Averags shipment last week 141,200 pounds.

THE PACIFIC COAST IN THE SPANISH LANGUAGE.—We have received a copy of *La Revista del Comercio, Precios-Corrientes y Cicerone de California y Los Estados y Territorios Adyacentes.* It is a San Francisco publication by Messrs. Casanova, Fairbanks & Co., and is a handsome monthly in pamphlet form giving information as its name implies, and ie for circulation in the Spanish States of America. The journal will endeavor to turn the trade of the southern countries in our direction, a result which would be of great advantage to our productive and mercantile interests.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4. Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	3 Copies of No. 17, April 27th.
1872	25	2 Complete volumes, last half (of year).
1873	26	4 Copies of No. 8, Feb 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	4 Copies of No. 10, March 8th.
1873	26	2 Copies of No. 7, Feb. 15th.
1873	26	1 Copy of No. 6, Feb. 8th.
1873	27	4 Copies of No. 20, Nov. 15th.
1873	27	5 Copies of No. 21, Nov. 22d.
1873	27	4 Copies of No. 24, Dec. 13th.
1875	30	2 Copies of No. 4, Jan. 23rd.
1875	30	2 Copies of No. 5. Jan. 30th.
1875	30	1 Copy of No. 6, Feb. 6th.
1875	30	2 Copies of No. 8, Feb. 20th.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING MAY 6TH, 1879,

STAMP BATTERY FOR QUARTZ MILLS—R. F. Bidwell, S. F.

MANUFACTURING OF BOOTS AND SHOES—Jos. Hohart, Nordhoff, Cal.

STAMP MILL—C. S. Stanchfield, Oakland, Cal.

CAR BRAKE—Nathan Webb, Sacramento, Cal.

DERRICK STAKE—R. P. Williams, Alameda, Cal.

CONVERTIBLE CHAIR—Frederick Janeen, Seattle Washington Territory.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

BEDLAM BROKE LOOSE.—Troubles multiply in Leadville. First, they had the winter with its frosts and snows, its overcrowding, starvation and deadly maladies. Then faults in the mines came to the surface—deposits too superficial and the ores of too low grade, lead out of all proportion to the gold and silver. And now anarchy prevails in the unfortunate camp. The adventurers, drawn thither through false and exaggerated reports, are wroth at the deception; and now, to get even with the crafty speculators who have beguiled them to ruin, are seizing upon the mines indiscriminately and holding them at the point of the six-shooter. Contention is the order of the day; lawsuits multiply and everything is involved in confusion and doubt. The outcome of this uproar and strife no one can forecast. Meantime, many are leaving disgusted with the place and its prospects, which can certainly be considered none of the brightest. It is a bad plan, this of overdoing things at the start. These Leadville villains might have learned as much and avoided these troubles had they studied carefully the history of mining on this coast and paid attention to its teachings.

RUST has made its appearance in Brown's valley, Napa county, and if the present weather continues, will affect the grain in Napa and Berryessa.

A WEALTHY San Francisco dentist has given $60,000 toward founding a college of Dental Surgery in connection with the University.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

GORDON CREEK M. CO.—Object: To operate in the county of Del Norte. Capital, $10,000,000. Directors—J. D. Gray, J. W. Musser, Spencer C. Brown, F. D. Brandow, J. W. Winslow.

VORTEX M. CO.—Capital, $6,000,000. Directors—Charles W. Fox, Alex. B. Brown, William H. Sears, George W. Fisher, G. A Miller.

FOULK G. & S. M. Co.—Object: To operate in Lake mining district, Mono county. Capital, $5,000,000. Directors—George W. Grayson, C. X. Hobbs, A. H. Rutherford, Thomas Bell, C. A. Burgess.

CHRYSOLITE M. Co.—Object: To operate in Mono county. Capital, $6,600,000. Directors—Robert F. Foley, Simon Reinhard, Henry Rosener, George R. Welle, Robert F. Morrow.

SOLANO ROMAN CEMENT Co.—Object: To manufacture, ship and sell cement. Capital, $60,000. Directors—J. K. Prior, J. G. Johnson, John Cochran, John G. Ayers and Horatio McPherson.

HERMIT G. & S. M. Co.—Object: To operate in Sierra county. Capital, $6,000,000. Trustees—Herman E. Gliffen, John Tonkin, F. M. Biker, Fred. Schumacher, Nathaniel T. Messen, John T. Bacon and T. C. Boyd.

KNIGHT OF MALTA Q. M. Co.—Object: To operate in Nevada county. Capital, $5,000,000. Directors—B. B. Lee, A. B. Dibble, C. W. Smith, Samuel Granger and Samuel Moore.

JUSTICE CON. G. M. Co.—Object: To operate in Lawrence county, Dakota Territory. Capital, $10,000,000. Directors—R. N. Graves, A. Borland, A. Hemme, George D. Haven and Homer S. King.

GOLDEN GATE M. Co.—Object: To operate in Lawrence county, Dakota Territory. Capital, $10,000,000. Directors—R. N. Graves, A. Borland, A Hemme, George D. Haven and Homer S. King.

NELSON G. & S. M. Co.—Object: To mine in Plumas county. Capital, $10,000,000. Directors—Archie Borland, A. Hemme, R. N. Graves, T. B. Kent and H. F. Morken.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 215 Sansome St., San Francisco.

A CLERK who has had good experience in the dry goods and grocery business, wishes a situation. Will give substantial and satisfactory reference and accept a moderate salary and "work up." Address "Clerk," at this office.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., May 14, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, May 14, 3 P. M.

SILVER. 1@60.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₰ cent. discount.

EXCHANGE on New York, 20, on Londoh bankers, 49½@49¾ Commercial, 50; Paris, five francs ₰ dollar; Mexican dollars, 88@89.

LONDON Consols, 98 11-16; Bonds, 104¼.

QUICKSILVER in S. F., by the flask, 40@41c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending May 13, 1879.

HIGHEST AND LOWEST BAROMETER.

May 7	May 8	May 9	May 10	May 11	May 12	May 13
30.280	30.135	30.167	30.231	30.202	30.123	30.041
30.140	30.113	30.149	30.172	30.206	29.955	29.923

MAXIMUM AND MINIMUM THERMOMETER.

57.7	56.2	60.3	57	50.7	65.5	60
45	47	48	47.3	47.5	51	51

MEAN DAILY HUMIDITY.

51	61.7	67.3	64.3	76.3	79.3	78

PREVAILING WIND.

NW	W	W	W	W	W	W

WIND—MILES TRAVELED.

289	259	238	218	387	242	287

STATE OF WEATHER.

Clear.	Clear.	Fair.	Clear.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1878, 22.09 in.

DEWEY & CO'S

SCIENTIFIC PRESS

Patent Agency.

SCIENTIFIC PRESS—Mining and Mechanical.

PACIFIC RURAL PRESS—Agricultural.

PATENTS obtained promptly; Caveats filed expeditiously Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons, and our success and business are constantly increasing.

The ablest and most experienced inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

DEWEY & CO., Patent Agents,

Office—202 Sansome St., N. E. Cor. Pine, S. F.

A. T. DEWEY. W. B. EWER. O. H. STRONG.

Mining and Other Companies.

Persone interested in incorporated sharee will do well to recommend the publication of the official noticee of their companiee in thie paper, as tho cheapest appropriate medium for the same.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Mount Jefferson Milling and Mining Company—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne county, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of March, A. D., 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Condee, G M, Trustee	32	3000	150 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	44	800	40 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	43	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	49	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	50	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	51	2000	100 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	54	1000	50 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	55	1000	50 00
Condee, O M, Trustee for the Mount Jefferson M & M Co.	58	11080	554 00
Fassett, N C	21	500	25 00
Fassett, N C	20	1000	50 00
Fassett, N C	22	500	25 00
Fassett, N C, Trustee	7	500	25 00
Fassett, N C, Trustee	8	500	25 00
Smith, O, Trustee	40	1000	50 00
Smith, O, Trustee	41	500	25 00
Smith, O, Trustee	42	500	25 00

And in accordance with law, and an order of the Board of Directors made on the 21st day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Tuesday, the 27th day of May, 1879, at the hour of three o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, Room 6, San Francisco, Cal.

BUY LAND

Where yon can get a crop every year; where you will make something every season; where you are sure of having a crop when prices are high; where you have a healthy place to live; where you can raise semi-tropical as well as other fruits; where you can raise a diversity of grain and vegetables and get a good price for them. Go and see the old Reading Grant (in the upper Sacramento Valley), and you will find such land for sale in sub-divisions to suit purchasers—at reasonable rates and on easy terms. Send stamp for map and circular to EDWARD FRISBIE, proprietor, (on the Grant), Anderson, Shasta Co., Cal.

Books for Miners and Millmen.

KUSTEL'S ROASTING OF GOLD AND SILVER ORES, and the extraction of their respective metals without quicksilver. Illustrated. 142 pages. 1870. A valuable and carefully written work. Postpaid, $2.50. Published and sold by Dewey & Co., S. F.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for gold-bearing sulphurets-arseniurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Post-paid, $7.50. Printed and sold by Dewey & Co., S. F.

PHILLIPS' EXPLORERS, MINERS AND METALLURGISTS COMPANION, comprising a practical exposition of the various departments of exploration, mining, engineering, assaying and metallurgy. 682 pages and 83 illustrations. A most valuable and comprehensive book of reference to prospectors and practical miners. Post-paid, $10.50. Published and sold by Dewey & Co., S. F.

AARON'S TESTING AND WORKING SILVER ORES.—Illustrated. 111 pages. 1876. A useful and practical work, free from technicalities and extremely serviceable for miners' use. Post-paid, $2. Published and sold by Dewey & Co., S. F.

COFF'S HANDBOOK OF MINING LAWS.—Containing the U. S. Mining Laws, Digest of Decisions, Forms, etc. 1877. Pocket size and very handy and convenient for miners. Post-paid, $1. Sold by Dewey & Co., S. F.

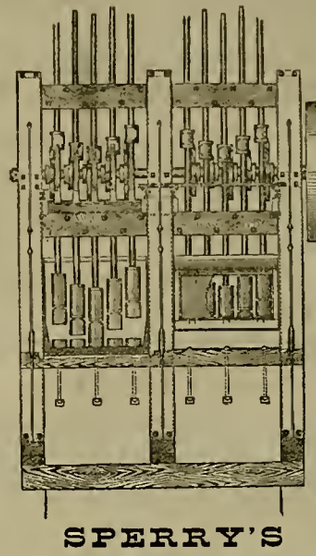
The Large Circulation of the MINING AND SCIENTIFIC PRESS extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana, British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

GOLD AND SILVER

Grinding and Amalgamating

MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



SPERRY'S

Wrought-Iron Frame

FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

No. 145 Broadway, - - NEW YORK.

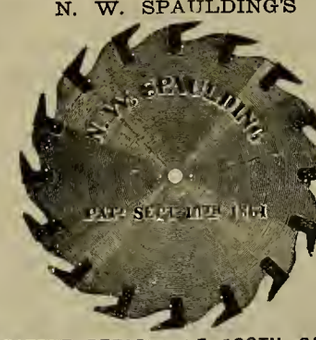
DESIRABLE OFFICES TO LET.

We have several sunny Rooms (lately occupied by A. W. Bowman and associates), adjoining the Mining and Scientific Press Patent Agency, at No. 202 Sansome street, corner of Pine, which we will rent permanently on very reasonable terms. Parties desiring pleasant office rooms should call and see them.

DEWEY & CO.,

No. 202 Sansome Street, May 15th, 1879.

N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS,

Manufactory. 17 & 19 Fremont St., S. F.

C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address O. C. BITNER, Spenceville, Nevada County, California.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

MISS FANNY DAVENPORT.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

B. MACAULEY.

Open every evening and Saturday Matinee.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
F. LYSTER.....Acting Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

THE MILLIONAIRE'S DAUGHTER.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

NOTICE

TO THE

MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Works, are the only parties authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the License of this Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

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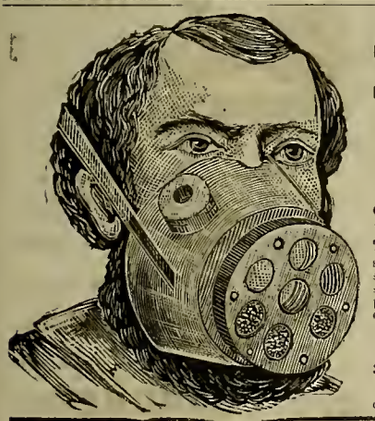

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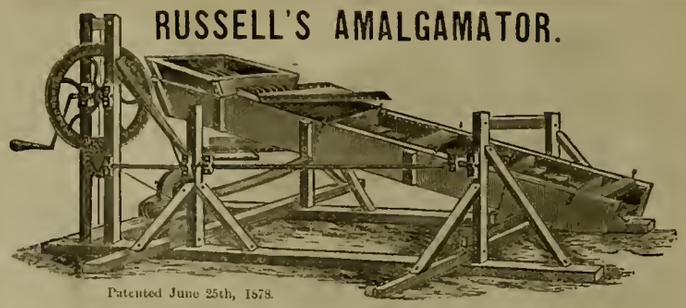

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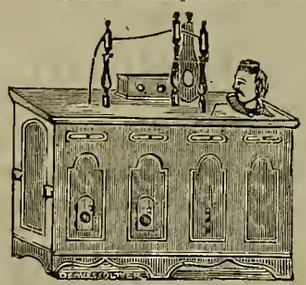

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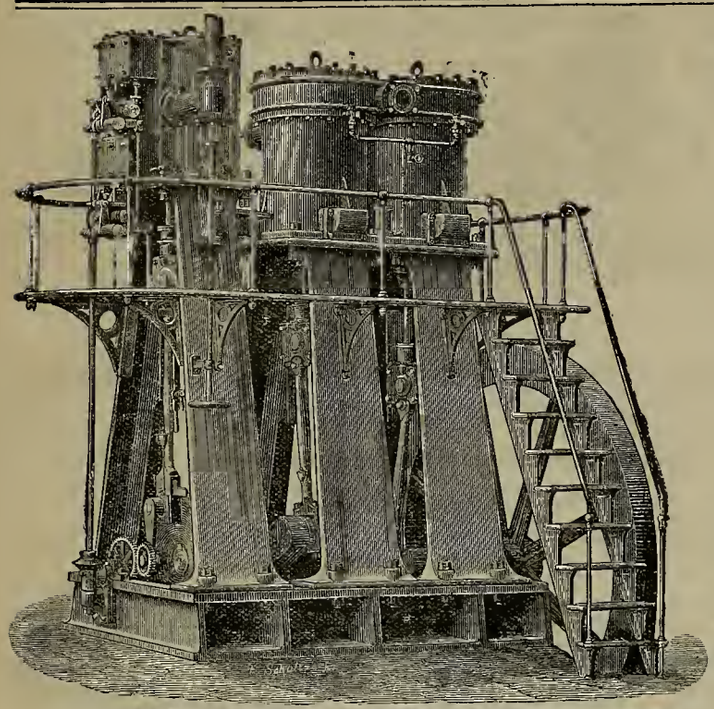

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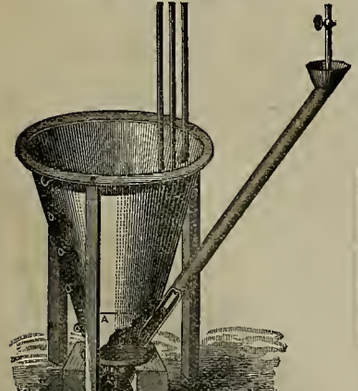

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, MAY 24, 1879. VOLUME XXXVIII Number 21.

Geodetic and Astronomical Observations at Great Elevations.

Prof. George Davidson has started the Coast Survey geodetic and astronomical party to the field for the work of the season. He will occupy two stations of tbe main triangulation: The first, Lola mountain, on the Sierra, about 25 milee northwest of Trnckee and 9,500 feet above the ocean. The second cn Round Top, a station 10,600 feet above the eea, and lying southwest of Lake Tahoe, over the Carson canyon and Placerville road.

The work at these stations will embrace the measurement of tbe usual horizontal angles between distant stations; latitnde determinations and azimuth of the lines. Besides these will be made special observations for the determination of the coefficient of refraction, magnetic and meteorological observations to study the law of hourly change at high elevations.

The lines of sight will extend as far north as Mt. Shasta, west from Mt. Linn through Helena and Diablo to a more southern station, sonth as far as Mt. Dana, and 60 miles eastward of the Sierras.

In order to make special search for the problematical intra-mercurial planet or planets, Prof. Davidson has purchased a six and one-half inch equatorial objective, by Clark, and has had constrncted a portable equatorial observatory with a revolving dome of 12 feet diameter.

The details of the gas pipe dome have been capitally worked ont by Mr. Pratt, of the Coast Survey; and this is believed to be the lightest observatory and dome constructed. Tbe covering is of heavy canvas, and, it is believed, will resist the strongest winds of the Sierra.

This undertaking has been an especial object of Prof. Davidson since the spring of 1873, when he made his examinations of the fitness of high elevations for astronomical work, the results of which were then communicated to the Academy of Sciences. The experiments will consist in observing snch objects as are well-known tests for a given size of telescope at ordinary elevations, whilst hie lengthened stay at the two stations will enable him to form a just opinion of the general atmospheric conditions.

The results of all ohservations have confirmed the opinions of Prof. Davidson in regard to the peculiarly favorable fitness of our mountain ranges for the location of an observatory, and yet that no undue bias might seem to influence his judgment he advised in 1873 and 1874, that the same observer and the same instrument should be used at all available stations, from Summit to San Bernardino, so that a fair judgment could be formed.

In the present examination it is probable that a second observer will make in the valley, or on the coast line, simultaneous and similar observations upon the same object.

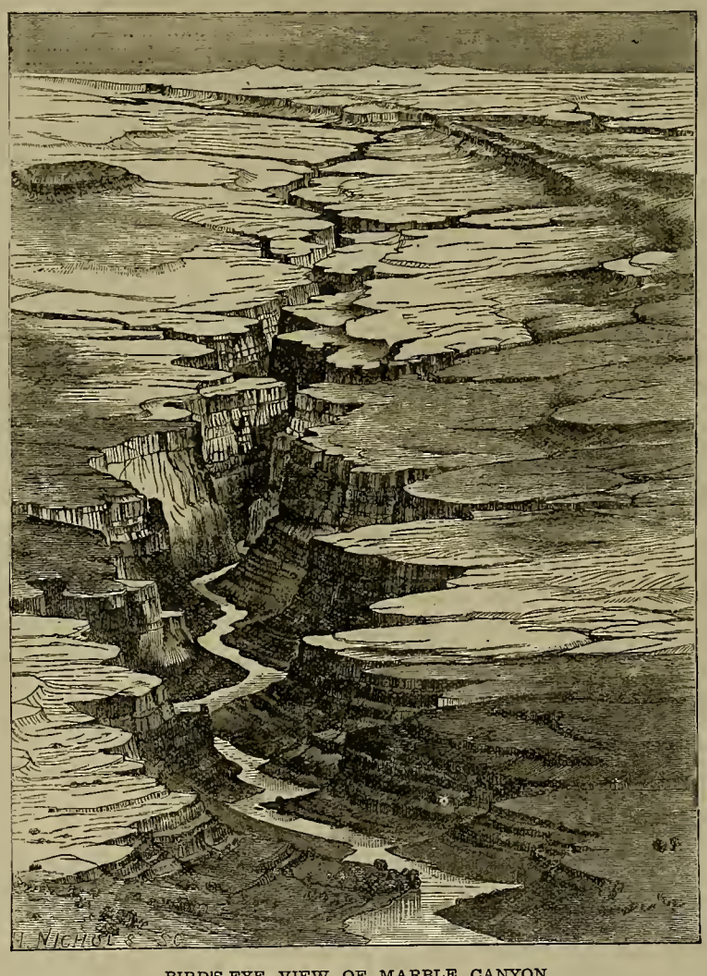
Although other investigations will be pursued, so far as time will permit, it is premature to announce them, as bad weather may mar some of the projected work. The lahors of the party will extend to the end of October.

After a Long Time.—For a number of years past several companies of miners have been engaged opening a series of ore-bearing veins in Alturas county, Idaho, the driving of lengthy tunnels haviug been among the means adopted to that end. The work has been a heavy and costly one, and success long delayed. We infer from what we see in the Idaho papers that these hardy men, the most of whom were Californians, have begun to reap some reward at last, several handsome bullion shipments having lately been made from these mines. What has tended to retard mining in that section of country has been its remoteness from lines of cheap transportation. Through the extension of the Utah Northern railroad this obstacle will soon be in good measure removed. The route of that road as determined upon will be across Big Camas prairie, skirting the Alturas mountains and thence down the Boise, passing within 28 miles of Rocky Bar, the site of these mining operations.

Marble Canyon.

In Powell's "Exploration of the Colorado River of the West," is given a view of Marble canyon from the Vermilion cliffs near the mouth of the Paria. This engraving is also given in Le Conte'e "Elements of Geology" (Appleton & Co.), from which we take it. In the distance, the Colorado river is seen to turn to the west, where its gorge divides the twin plateaus. On the right is seeu the Eastern Kaibab displacements, appearing as folds, and, further in the distance, as faults.

The general surface of tbe country between the mouth of the Paria and that of the Colorado



BIRD'S-EYE VIEW OF MARBLE CANYON.

Chiquite, is the summit of the carboniferous formation. At the mouth of the Paria, this is at the waters edge; at the mouth of the Colorado Chiquite, it is 3,800 feet above the river. The fall of the river, in the same distance, is about 600 feet, so that the whole dip of the rock hetween the two points is about 3,200 feet. The distance by river is 65 miles; in a direct line, 20 miles less. We have therefore a dip of 3,200 feet in 45 miles, or about 70 feet to a mile. The slope of the country to tbe north is the same as the dip of the heds, for the country rises to the south as the beds rise to the south.

Stand on the Vermilion cliffs, at the head of Marhle canyon, and look off down the river, over a stretch of country that steadily rises in the distance, until it reaches an altitude far ahove even the elevated point of observation, and then see meandering through it to the south of the gorge in which the river runs, everywhere breaking down with a sharp brink, and in the perspective the summits of the walls appearing to approach until they are merged in a black line, and you can hardly resist the thought that the river hurrows into, and is lost under, the great inclined plateau.

Another Aged but Well Preserved Pioneer Gold Finder.—An Eastern paper, after commenting on the injustice we do Gen. Sutter in refusing to suitably reward him as the discoverer of gold in California, goes on to remark that Bernardo Treres, who first found gold in Arizona, has been suffered to go equally unrewarded. Seeing that gold mines have hecn worked in Arizona by the Spaniards for several centuries, as they were worked probably by the Aztecs a good while before, this Bernardo Treres must be a person now well advanced in years, such protracted longevity being due doubtless to the fact of his "keeping a miserable tavern," which business, according to the above authority, he is at present engaged in. It may by the way be observed, that it was not Gen. Sutter hut James W. Marshall who picked up the first piece of gold found in California. Marshall heing old and poor should now get him a stock of arguardente and open a "miserable tavern," and thus place himself in the recognized category of original gold finders.

Kern and Inyo Counties. — Mr. Milton Kennedy will visit Kern and Inyo counties during the next few weeks, in the interest of the Press. We request our readers in those counties to aid and advance him in his work, as their disposition and convenience may suggest.

Eastern Investors in Pacific Coast Mines.

We had the pleasure of a conversation this week with Prof. W. P. Blake, a gentleman who is well-known by reputation at least, to all of our mining readers, and who rcently came from the East for the purpose of visiting the Arizona mining regions. He has just returned from Arizona, and has now gone on a tour to Amador and northern mines. He expresses himself as well pleased with what he has seen of Arizona, but like others, considers it as yet a poor country for a poor man to emigrate to. At present little can be done there except by associated capital towards the development of mining property, everything being so expensive.

In talking with Prof. Blake we find ho agrees with us in remarks we have repeatedly made with regard to parties buying small parcels of stock in mines of which they have no knowledge and over which they have no control. He says that in many of the Eastern States there are persons traveling about selling stock in Pacific coast mines to persons in the cities, small towns, farms, etc., in an indiscriminate manner which will surely work injury to those foolish enough to invest, on the representations of persons whom they do not know. Great expectations are held out about large dividends, and the isolated example of the "honanza kings" quoted as of every day occurrence among mining men. People with no knowledge of mines are apt to be led off hy such represeutations, and invest their money foolishly.

In Arizona there are a great many mines with small veins of rich ore, which assay up into the thousands. Selected samples are taken and assayed, and the certificates of assay exhibited as if showing an average of the ore. This sort of thing fools our own people here, and will surely take in those not acquainted with mining matters. Prof. Blake thinks our coast papers should warn Eastern investors of the danger they run in huying such stock without knowing anything ahout it. Wheu stock in a mining company is scattered ahout in small lots in tbis way, there is almost always sure to be a loss. No one has stock enough to take the proper interest to see the affairs run or managed in an economical manner, and finally all hands lose their money.

There is a large field for investors here in California, he thinks, in legitimate mining operations, where a few men may huy and work a mine without any stock manipulating. We are glad to find that our opinions on this subject are seconded hy an authority like Prof. Blake; and hope that our contemporaries will lend their aid in preventing any reckless investments of Eastern capital in projects which to say the least are douhtful, in view of the way in which they are put before the public.

Copper Mining. — The copper mines at Spenceville, Nevada county, are being worked quite actively, notwithstanding the prevailing low prices for that ore. Monthly ore shipments are made from these mines to the value of $9,000. The ore here, which carries about 30% of metal, is sent to this city and marketed at a good price. The owners talk of reducing the ore at the mines, by a process that will bring the metal first iuto a liquid state. We note also increased stir in the copper mines of Calaveras, Del Norte and elsewhere in this State. In eastern Arizona, too, copper mining is being pushed with a vigor that deserves, as it no doubt will, command a large success.

A Search Along the Sierra.—Extending through Fresno, Tulare and Kern counties, there is thought to he a strong metalliferous helt lying pretty high up along the west slope of the Sierra. Some prospecting has been done here in times past which led to the discovery of promising ore-bearing lodes at one or two points, notably so in the Mineral King district. Fair assays in silver were obtained from these lodes, but these discoveries not having been followed up hy any thorough development, very little is known as to their actual value. Fresh parties having gone out with the purpose of giving this region a more extended examination, their report will be awaited with some interest and a general desire that it may be favorable.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Gold Fields in the Agricultural Counties of California.

Editors Press:—When we hear of gold fields something strikes our nerves resembling electricity, we never ask how much labor it takes to obtain sufficient gold to exchange for a $20 piece, the "fact" of gold or silver is sufficient to make the stir, and if anything like a show is made, as has been the case in Leadville, thousands go there, most of them losing their money instead of making any, and return generally broken in pocket, in health and spirit. Up to late years one good quality has been indisputable in hotb gold and silver, the producer of it had not to look for a market; but lately even this cannot he said of silver, because it has become a drug on the market.

Within the last ten years there have been hut two articles produced of which the demand has been greater than the supply, these have been gold and sugar.

The United States of America bas to ship every year one hundred million dollars in gold to exchange for her supply of sugar, eighty millions of this going to Cuba. The "Pearl of the Antilles" takes hardly anything in exchange from the United States hut her gold. Our consumption of sugar increases with our civilazation, England and the United States being the largest consumers of sugar in the world. Fifty years ago all the sugar consumed in the world, with trifling exceptions, was cane sugar, but since then beet sugar has appeared on the market of the world and made such an immense progress that last year more than one-half of all the sugar in the world was produced from the sugar beet. Bearing this fact in mind, it cannot surprise anyhody that the sugarie industry in France and Germany is of greater importance to those countries than any other industry of whatever nature.

The comparatively small island of Cuha produces annually the enormous sum of $250,000,000 in her sugar fields. Even the Sandwich ielands, which are mere specks in the Pacific ocean, come in for a fair slice of all the gold produced in California, their sugar fields yielding the dollars fully as surely as our gold mines.

What good then does our gold and silver mining do us, when we ship all our mines yield us and more out of the country in exchange for one single article, which is indispensable and which we do not produce? And strange to say the United States is more favorably situated to produce large quantities of sugar than any other nation on the globe. Cuba and the Sandwich islands are not excepted, for it is a long established and acknowledged fact that one acre cultivated in sugar heets produces more sugar than the same quality of ground cultivated in sugar cane.

Within the last 12 months 14 corporations have heen organized for the manufacture of sugar from heets in the eastern part of the United States, and Canada. In former years several attempts had heen made to introduce the heet sugar industry in California, and this ie the less surprising, as there is uo State in the Union so favorably situated, or possesses a soil and climate which could stand any comparisons with California. Yet notwithstanding these great advantages, notwitbstanding the fact tbat when properly inaugurated the agricultural part of California could produce more dollars from the sugar heet fields than all the gold and silver minee on the Pacific coast combined, while, like any other country where the heet sugar industry has found a home, California need not produce one bushel of grain less—in fact, it naturally would increase in every other agricultural product, while she could produce a hundred million of dollars in sugar beet fields.

The attempts at beet eugar production so far have not heen successful in California. Three sugar factoriee bave been estahlisbed, and it is hut rigbt to inquire into the causee wbich interfered with their success. But before going into the details of these experiments, it should he distinctly stated, what every farmer no doubt is aware of, that beets can he raised in California in unlimited quantitics, and even at a reasonahle price will yield the farmer larger cash returns than any other crop he can raise. The quality of the beets is certainly ahove tbe average, they being by far superior to those grown in France, and almost as good as the best in Bohemia and Germany, and with experience in proper cultivation will still improve. I have analyzed (polarized) some beets on tbe first day of May. They had been during the whole winter lyiug in opeu pile exposed to the weather, the late warm spell and the sun having wilted them to some extent. The result was as follows: Specific gravity of juice hy Balling's per cent. meter, 23.00; sugar in the same, 17.50; co-efficient of purity, 76.09. Of course the large amount of soluhle matter in the juice was partly caused hy evaporation of water, hut even making due allowance for their wilted state, these beets were even on the first day of May superior to any beets I bad worked or analyzed during last winter in tbe State of Maine.

As the large production of beets and the good quality of the same for sugar production has never beeu doubted aud is an admitted fact, it is useless to say more about it at present, hut the question remains to be answered, wbat tben have been the causes of so indifferent success of these tbree sugar works? I propounded these questions to several parties before I came to California, and received the following answers: "Incompetency and dishonesty on the part of those who were entrusted witb the erection and management of the sugar works," was tbe reply of one party. Tho other stated he was satisbed one was built to facilitate the sale of land, the other to swindle, and that both accomplisbed wbat tbey were intended for.

The first party might be answered that two German sugar manufacturers have been here whose reputation for capacity and integrity is acknowledged by those who are best able to judge; aud the second might be answered, that neither of all the beet sugar factories here, as they were first built, could have worked in any other part of the world. A beet sugar factory in California, in order to work successfully, wbicb is equivalent of earning a profit for its owners, must not ouly be a raw eugar factory, but a sugar refinery at the same time, and sucb au establishment cannot be built in Europe for either $15,000 or $75,000, as it has been attempted bere. It will be difficult to find a raw sugar factory in Europe which has not cost to erect over $100,000, but sucb an establishment has no ghost of a chance of success bere, because tbe interest of sugar refiners is in opposition to beet sugar manufacturers. The beginning tberefore in an insufficient way is a sure foundation to failure. Once started in tbis way, and all the patching and all the assessments which follow will not make it a success. Tbis has been the case witb the heet sugar manufactories in California. It makes no difference how much money they have finally lost, they did not invest enough in the etart. They have been penny wise and pound foolish, and if they had pursued tbe same course in the best beet sugar districts of the world, they would have met with as sure failure.

If hut one-tenth part of the money invested and sunk in Leadville had been invested in the heet sugar industry, an industry might have been started on a sound foundation, producing more dollars every year than all tbe gold and silver mines in tbe United States combined.

A new attempt is made tbis year to start at least one paying heet sugar factory in California. Of its progress and relation to farming in California, I will speak in another communication.

Ernest Th. Gennert.

The Solar Salt Marsh.

The Ogden *Freeman* publishes tbe following item relating to the wonderful salt marsh lying nortb of Pioche:

Eighty milee from Cherry Creek, on tbe line of Utah and Nevada, 20 miles south of the old overland stage road, is a wonderful and very productive salt mareb that is one and a balf miles wide hy four miles long. In the spring of tbe year this overflows from surplus water tbat comes from tbe eurrouuding country. There are some 200 fresh springs in and around tbis marsb, affording water good to drink. Of these springs none of them are more tban 100 yarde distant from the marsh. In the summer season the water evaporates, leaving a depoeit of salt from two inchee to one foot thick. The dietance from great Salt Lake is 175 miles, with mountain chains intervening. Last year 2,000 tons of salt was wagoned from this marsh to Cherry Creek, Ward, Pioche and Hamilton for use in reducing ores. It is worth $13 at the marsh and $20 at Cberry Creek, the neareet camp. The property is owned by tbe Solar Salt Co., composed of Judge Riley, M. J. O'Connor, Jobn O'Dougherty and William Barry. One contract made last fall to supply this salt at Ward amounted to tbe neat little sum of $35,000. In collecting the salt 7 white men and 13 Indians are employed. It costs $2 per ton to put it on wagons. The process of gathering it is to use little band scrapers to collect it in piles, from which it ie sboveled into dummy cars that run on a temporary track laid to solid ground, where it is transferred into wagons for shipment to the mining camps.

New Mode of Treating Caoutchouc.—To make caoutchouc indifferent to the action of oils and fats without impairing the otber properties of vulcanized ruhher, the following method is employed at the works of C. Schwanitz, Jr., at Berlin: The caoutchouc is worked hy heated rollers together with a mixture of six pounds of prepared chalk, one pound of glycerine of 1.23 sp. grains, one and two-thirds ounces of litbarge, and three and one-fifth ounces of eulphur. For vulcanizing the mass or the article formed thereof is placed in a hath of glycerine, and exposed to a steam pressure of from two to three atmospheres.—*Deutsche Gewerbe Zeitung.*

Glycerine in Food.—Catillon, a Frencb physiologist, found that the addition of from seven to eigbt grains of glycerine to the daily ration of a lot of Guinea pigs increased the effect of tbeir food so tbat they gained from one-tenth to one-fifth of their weight in a given time, while a second lot fed on the same ration, hut without glycerine, gained nothing; when the dose of glycerine was changed to the second lot they gained in weight, and the first lot gained nothing. Large doses of glyceriue, bowever, cause derangement of the digestive ergans.

Copper vs. Silver.

Which Can be Mined and Worked most Profitably?

In refereuce to my communication of January 16th, tbe following estimates will sbow what may he done by working the copper ores of tbis southern portion of the Territory; and it is really inexplicsble, with snch facts staring them in the face, that cspitalists should persistently ignore copper aad confine their operations to the more risky, though attrsctive, mining (and speculation) in gold and silver properties. Even our usually wide-awake prospectore apparently fail to perceive that copper ore assaying 25% is wortb $75 per ton, and is free from tbe drawbacks attending silver in the shape of a depreciated etandard, imperfect reduction, involving a loss of (say) 25%, besides loss of mercury, high rate of expressage, etc.

While ores as low as 8% may be worked by the Hunt & Douglas system, tbe high grades may be smelted, preferably, in water-jacket, copper-plated, or otber improved furnaces, or even shipped in the crude state wben exceeding 50%.

It should also be borne in mind that copper mines are not, as a rule, so liable to give out as those of silver or gold, wbile tbe metal is equally marketable. Its price also being now at a minimum, the prohahilities are greatly in favor of a rise ere long.

High-grade magnetic and hematite iron ores are found in the vicinity of many of our rich copper districts—often in immediate proximity with the copper mines tbemselves—whicb will furnish the material for producing the spongy iron required, in the absence of scrap iron, to precipitate tbe copper.

Estimate of capital required to purchase copper mines, erect plant, and work 20 tons of ore per day, by wet process:

PLANT.

For Copper—	
Pulverizer	$ 2,000
Furnace (roasting)	2,500
Tanks	3,000
Engine and boiler	5,000
Pumps and other small appliances	1,000
Buildings	1,000
Refining furnace	1,500
Hunt & Douglas' royalty	1,000
Office and assay fittings	500
For Sponge Iron—	
Crusher	2,000
Frue's concentrator	1,000
Retorts	1,500
Receivers, etc	500
Buildings	500
Total	$23,000

WORKING EXPENSES—PER DAY.

Labor—	
Superintendent	$ 20.00
Assayer and clerk	10.00
Foreman	8.00
Two engineers	10.00
Two assistants	6.00
Two grinders	6.00
Four roasters	12.00
Four smelters	12.00
Eight tank men	24.00
Material—	
Salt, 3,500 pounds	87.50
Iron, 7,500 pounds	187.50
Wood, 10 cords	50.00
Candles, oil, wear and tear, etc	20.00
Miscellaneous—	
Mining 20 tons per day	40.00
Hauling	100.00
Freight on 5 tons of copper to San Francisco, New York, or Liverpool, vla Gulf of California	250.00
Daily disbursements	$ 843.00
Five tons copper	1,500.00
Daily profits	$ 657.00

Or $32.85 profit per ton of ore.

CAPITAL REQUIRED.

To buy copper mines (say)	$25,000
Erect plant	23,000
Opening mines, road-making, and other preliminary expenses	16,740
First month's expenses	25,260
Total	$90,000

PROFITS.

On 12 months' working	$123,652
Deduct for contingencies, 50%	61,826
Net annual profit	$ 61,827

Which, on an outlay of $90,000, is 68.7% per annum.

Advantages of Copper over Silver Mining.

Silver is not being worked beyond 70% or 80% of its assay value, and when obtainod has to be sold at a discount of 20%, and pays in express changes and commissions another 5%—making a total deduction of (say) 50% from assay certificate—in addition to mining and reduction charges.

EXAMPLE—ASSAY VALUE, $100 PER TON.

Mining (say)	$ 2.00
Hauling	5.00
Reduction	30.00
Loss in reduction	25.00
Discount (20%)	15.00
Expressage, etc. (5%)	3.75
Total	$80.75

Leaving a profit of $19.25 per ton of ore.

Copper, on tbe other band, can he worked to ½% of its assay value, and is sold at its full market price without discount, paying ordinary merchandise freightage, being unattended with risk of rohhery.

Example—Assay value, as ahove estimates on 25% ore, $75 per ton; mining, bauling, reduction, add freight to market, $42.15—leaving a profit of $32.85 per ton (43.80%), or more tban double the profit ohtainable from silver ores of same assay value.—*W. T. Rickard, F. C. S., in Arizona Star.*

Birds of the Colorado Valley.

A recent government publicatiou of much value to the agricultural interest, as well as to ornithological science, is entitled "Birds of the Colorado Valley," by Elliott Coues, of the staff of tbe Hayden Survey. Tbis work is designed as complementary to the author's former treatise, "Birds of the Northwest," and is marked by tbe same thoroughness of execution and accuracy of detail characterising his many previous works, and must prove one of the most useful ae well as popular contributione to American ornithological ecieuce. In perusing the volume it is evident that tbe autbor's purpose of so divesting the biograpbical portion of tecbnicslity as to meet the tastes and wants of the general public bas been fully ohtained. Dr. Coues, wben he chooses to relax from the rigidity of purely ecientific etyle, possesses a bappy faculty of combining a scientific and pleasantly popular element in bis writings, and no one csn depict bird life with more vivacity and truthfulness than be. Often tbe reader will find it impossible to repress a smile in contemplating tbe serio-comic truthfulnese of his application of buman motives and characteristics to tbe birds, which, if he be at all familiar with them, will appeal forcihly to his own, perbaps unconsciously received impressions.

As implied in the title, most of the biograpbical portion of tbe work is limited to tbose species inhahiting that region drained by tbe Colorado river of tbe West and its tributaries, including Arizona, much of New Mexico, Utab and Nevada, a part of the State of Colorado, and some of southern California. All otber species, however, known to occur witbin the limits of the United States are synonomatically and descriptively treated, truly rendering the work "a repository of scientific and popular information concerning North America ornithology."

Of each species the syuonym is oxbaustively presented; tbis heing followed hy a complete external description, including sexual aud seasonal plumage variation, preceded hy a concise enumeration in Latin of diagnostic characters. The latter portion of the volume ie devoted to a "Bibliographical Appendix," or list of publications relating to North American ornithology, and ie unique in point of thoroughnese and modo of execution. It is really hut an instalment of a general bibliography of the ornithology of the world upon which the author has long heen engaged, and coneists of the "titles and digests of works and papers relating solely to the birds of North Amcrica indiscriminately, collectively or in general," and must prove an invaluable source of assistance to future workers in this field. Indeed, to the general reader it possessee a peculiar intereet as ehowing the rapid progress of tbis hranch of science, from tbe imperfect allusion to our most ahundant and familiar birde in puhlications of the seventeentb century, to the elahorate and comprehensive treatises on tbe subject of tbe present day. The "Birds of the Colorado Valley" being a government puhlication ie not for sale, but can perhaps he obtained througb Congressmen or coneulted iu the public libraries. It will please all who have a taste for hird studies.

Sinking Rivers.—All of the principal and many of tbe smaller streams in Nevada have no visihle outlet. The larger rivere all terminate in lakes of very considerable area, respectively. The most singular tbing is that tbe water supply in these lakes is at all times the same. The spring freshets, filling tbe rivers from bank to hank work no perceptible change in these great reservoirs. Wbat becomes of all this water is the mystery. It bas been the generally accepted theory that there exists a suhterranean connection hetween the Nevada "sinks" and the Pacific ocean. But this theory ie now disputed hy a gentleman who bas resided on the sbores of Humholdt lake for years. The *Silver State* bas the following on the subject: A great many persons entertain tbe opinion that there is a suhterranean outlet to tbe sink of the Hnmholdt. One of tbese expressed bis views on tbeeuhject in the presence of Walter Schmidt, who has resided near the sink for several years, and built a quartz mill near the visible outlet of the lake. Schmidt dissented from this opinion, and argued that as tbe sink has a hard, clayey hottom, impervious to water, it would he impossihle for it to soak through underground, and attrihuted the disappearance of tbe river to evaporation. "This," said Mr Scbmidt, "is so great in the summer time that a wooden hucket filled with water in the morning would be empty hy noon, and would fall to pieces hefore night."—*Eureka Sentinel.*

Eastern Money and Western Mines.—Now that there are no more four per cent. Government honds to be hought without paying therefor a round premium, it may be expected that Eastern capital will flow towards this way for investment. There is much idle money in the older communities, and as tbis must soon find employment somewhere, it is reasonahle to suppose that a good sbare of it will be emharked in mining enterprises on tbis coast. As the scare over our new Constitution snbsides, tbe purpose hcfore entertained among Eastern capitalists to hecome largely interested in our mines, grows strong again.

MECHANICAL PROGRESS.

Automatic Machinery.

We give the following for what it is worth. We place very little confidence, however, in the story, notwithstanding the very respectable authority from which it purports to emanate. There is evidently some mistake or deception in the matter. We quote from the London *Warehouseman and Draper's Journal:*

"In our issue of the 15th ultimo we were enabled to give particulars respecting some newly invented machinery now in operation at the Oak mills, near Low Moor, in the immediate vicinity of Bradford. The most important part of the announcement was that the machinery had been constructed to run all night without attendance or supervision, and was actually doing so, producing the whole time, and with unfailing regularity, a variety of articles for which the mills are so well known. The statement was very naturally regarded by many persons as a hoax. If correct, it would bring about, they said, a complete revolution in the art of manufacturing, but it could not possibly be true, and there was no use in discussing the matter. We are now able to hear personal testimony to the accuracy of the announcement. We have visited the Oak mills by night, in company with Mr. Binns and a friend. The building itself was in darkness, but we could hear the rumble of machinery as we approached. The door was unlocked, and a couple of candles were lighted. By the dim light we saw the machines all at work, and passing from one to another we noted also what they were producing. There was no possibility of deception and no room for doubt. We were not there to examine the construction of the machinery; it was sufficient to be able to verify the main fact, which is, that when the working hours at the mills are over, the lights are put out, the building is locked up, and the machines are left working all through the night, producing large quantities of beautiful articles in great variety of pattern in silk, cotton and wool. Coming out of the mills and locking the doors behind us, we next visited the engine-room, which is in an adjoining building, completely cut off from the mills, and communicating with them only by a hole in the wall, through which the driving-wheel passes. The engine and boiler requiring attention throughout the 24 hours, the engineer is relieved by a night attendant, who takes his place at the close of the day."

A Costly Iron Fence.—Probably the finest iron fence on this coast has recently been erected just out of Oakland, in front of the residence of Mr. R. R. Thompson. His grounds have a frontage of 310 feet, along which the owners resolved to put up a fence which would stand for centuries as a bar to trespassage. The architect employed was Mr. C. H. Foster, of Alameda, who employed Messrs. Fraunder & Morck to carry out the plans, which are described by the Oakland *Times*, as follows: A deep trench was dug for the foundation, and 23,000 bricks were used in preparing for the iron coping. The posts are of iron, securely anchored deep in the ground and held in the wall by a heavy iron collar. They are over seven feet in height, and ample spaces are left for a free circulation of air. The pickets are heavy bars of wrought-iron, seven-eighths of an inch square, surmounted by an ornamental cast-iron point. The longest pickets are four feet and ten inches, held in place by three heavy wrought-iron stringers, and the alternate pickets are three feet and two inches in length, held in place by the two lower stringers. The posts of the great gate, in the center, are 22 feet high, including the gas lamps that ornament their tops. These posts are held together by an arch of wrought-iron, consisting of scroll and ornamental work, every piece hammered out on the anvil of Fraunder & Morck. The gate posts, cast in pieces and fastened together in the most substantial manner, are hollow, and a large rose bush, trained through the openings on each side, passes up the post and along the arch to the center. Forty thousand pounds of iron were used in building this fence, the total cost of which will be about $6,000. It will be finished in imitation of bronze. It is a great credit to the Oakland establishment that produced this splendid piece of work.

Interesting Figures.—Some interesting figures in regard to the life of rolling stock and superstructures have been compiled by the Illinois railroad commissioners, from the returns of 26 roads reporting on the subject. They show the following general average of duration: Locomotives, 15½ years; passenger cars, 15¾ years; stock cars, 10 years; freight cars, 11½ years; iron rails, 7 years; steel rails, 14 years; oak ties, 7 years; pine ties, 4⅝ years; cedar ties, 5½ years; truss bridges, 9½ years; trestle bridges, 8 years; pile bridges, 9 years; joints and fastenings, 7 years; and fencing, 8½ years. The Toledo, Peoria & Warsaw road gives the life of locomotives at 8 years, and of passenger cars at 15, while the Michigan Central gives locomotives 24, and passenger cars 20 years of life. Only one other road puts the life of passenger cars at 20 years. The lowest reported life rate of passenger cars is 8 years. The shortest life of iron rails is 3 years; the longest 12. Four roads give 10 years. Only four roads report the life of steel rails, and they give it as 9, 12, 15 and 20 years respectively. The reported life of truss bridges ranges from 5 to 20 years; of trestle, from 5½ to 10; of pile from 6 to 12; of fencing from 5 to 10.

The Keely Motor on a New Tack.

Mr. Keely has made, what he calls, another advance in his "motor." His former generator, which cost him some $60,000, has been thrown aside as worthless, and replaced with a new and entirely different machine, which he calls a "vibratory engine." He has also re-christened his new "cold vapor," as he has heretofore called the substance which he proposes as a substitute for steam, and now calls it an "intermolecular etheric substance," a name less open to scientific objection.

He still, however, claims to obtain a pressure of 20,000 pounds to the square inch, by simply using a little water, moving a short lever and opening a four-way valve, by which his "intermolecular etheric substance" is isolated and confined; but he does not tell us upon what principle this etherial substance, which, in its normal condition, is so attenuated as to pervade all nature, can be so confined as not to pass readily through the pores of iron, which admit quite a free passage to many of the advancing gases, and through which even water will pass under the pressure sometimes given to the hydraulic jack.

In Mr. Keely's new departure, however, he has abandoned the idea of "pressure" and employs, as already stated, a "vibratory" engine, which is described as follows:

Its main part consists of a steel disk, about 30 inches in diameter, having a shaft passing through it. The disk is intended to revolve in a vertical plane. Projecting from the disk at right angles to it and near its periphery are a series of 288 steel pins about one-eighth of an inch in diameter and varying in length from about five inches to two and one-half inches, these pins being highly vibratory. The disk is surrounded with a cast-iron casing resting on a cast-iron bed-plate, underneath which are some steel disks that are also highly vibratory. The function of the steel pins is, according to Mr. Keely's explanation, to intensify the vibration of the inter-molecular etheric substance, producing "a rotary or vertical circle of vibration," which circle of vibration runs the engine. By this device Mr. Keely says he has succeeded in harnessing the power of vibration, hitherto, except in music, known only as a destructive power, against which engineers had to guard with the greatest care.

Probably the most wonderful thing Mr. Keely has yet done, or will ever do, is to so completely hoodwink certain capitalists as to continue to draw money from their pockets to carry on his useless and visionary schemes.

The First Steel Bridge in America.—Arrangements have been concluded by Gen. D. D. Smith, chief engineer of the Chicago & Alton railway, for constructing the first all-steel bridge in America. Gen. Smith will be remembered by his connection with the United States Government Board for Testing the Strength of Iron and Steel, experiments which were carried on by him several years ago. His researches have at last brought him to the conclusion that steel bridges can be built cheaper than iron, and be equal in durability. The bridge will be erected over the Missouri river on the Chicago & Alton railway. It will be of five spans of 350 feet each. The elevation over high-water mark will not be less than 80 feet, at which hight the light steel rods of the "Howe truss" will look like silver cobwebs, glimmering in the sunshine. For all its frail appearance, the bridge will have a strength reached by but few existing structures in the world. The total amount of steel used in the construction will be about 1,500 tons, equivalent to almost double that quantity of iron.—*American Journal of Industry.*

Different Methods of Working.—A good illustration of the different methods by which mechanical and engineering work is sometimes done may be found in the history of the transportation and setting up in London and Paris respectively, of the two Egyptian obeliske, Cleopatra's Needls and the obslisk of Luxor. In erecting the obelisk of Luxor more than 200 men and a very complicated mass of machinery were required. Only 25 men and very simple apparatus were used in erecting Cleopatra's Needls upon the Thames embankment. The transport and erection of the obslisk of Luxor cost the French government nearly $75,000; while the expenses for the same operations upon Cleopatra's Needle only reached about one-fourth of that amount. This difference is altogether out of proportion to the difference in weight and and dimensions of the two masses. Cleopatra's Needle weighs 186 tons and is 65.5 feet in hight; the obelisk of Luxor weighs 225.9 tons and is 74.9 feet in hight.

An Improved Knitting Machine.—The English correspondent of the *Iron Age* writes in regard to a new American knitting machine, as follows: I heard the other day, of a wonderful American machine which has just been introduced into this country for knitting purposes. It is now at Nottingham, and is said to be of such an amazing kind that the finest weaving machine is a "mere fool to it." Some of the Lancashire manufacturers at Bury and elsewhere are not unlikely to adopt it for hat making, and a variety of other purposes. It has 42 needles—or may have 10,000 if need be—and may be readily run at 160 revolutions per minute. It is the invention of a Scotchman, who has spent 14 years in perfecting it. He offered it first in England, but could not obtain a purchaser. He then went to the United States, where its merits were speedily recognized and appreciated. Having sufficiently protected his machine by patents, he is back again in England, and is said to be about to sell his rights to a wealthy company.

An English Workman on American Nails. An English workman thus testifies in the *English Mechanic* to the good quality of American wares: But I speak of things which I know thoroughly well, when I say that in very many things our manufactures are not fit to be shown in the same street with American ones; and this is not merely in knick-knacks or little ingenuities, as to which it is tolerably evident we have no pretension to enter into any comparison. I only invite anyone who doubts my statement to compare such a rough common matter as "cut nails." Our rubbish, with half of them split up, which tends to turn round in the wood and split it, and with conical heads, look very poor against the straight, clean nails, with well-formed heads, which the Americans used to send out to Australia, and which when I had once seen them, prevented me from ever buying an English nail again as long as I could get the American ones.

Demand for Railroad Iron.—A French writer estimates that 4,000,000 rails are required every year to renew the worn out stock on the railways of the world already in operation, besides what are needed to lay down new roads. The average wear of a rail is 10 years. The rolling mills of the United States have a capacity of nearly 2,000,000 tons, though our consumption of rails, including imports, is not half that amount.

SCIENTIFIC PROGRESS.

A New Blasting Compound.

A new blasting compound, composed of gun cotton and nitrate of baryta, and invented by Mr. J. E. Huetter, is now in extensive use in Germany and England. It is especially recommended for mining purposes, as no smoke nor dangerous gases are generated by its explosion.

Moist gun cotton is passed between a series of rollers, by which it is compressed so as to form hard, moist lumps. In order to obtain it in the form of powder, it is now passed through a mill. The powder is, in conical vats, mixed with water containing a little ammonia and caustic soda, so as to form a thin paste. Through the bottom of the vat a current of air is introduced, keeping the entire mass in constant motion. At the same time the temperature is raised to 236° Fahr. by means of steam passed through the mass. After the lapse of three hours the gun cotton has attained a sufficient degree of purity. It is now well washed with pure water, and is now ready for mixing with the nitrate of baryta. The latter salt has, after protracted trials, been found to be the most suitable of all nitrates for this purpose, as it does not only give rise to a minimum of smoke, but also permits the development of the practically greatest force within the smallest space. The materials are mixed in equal proportions. The gun cotton is previously dried in a centrifugal apparatus, and is then passed through a mill together with the nitrate. The powder obtained is now pressed into cartridges. The cartridge press consists of a horizontal iron plate revolving around a vertical shaft. The plate is two feet in diameter, and into its upper surface are sunk round holes corresponding in size to the cartridges. The holes being filled with the powder, the latter is compressed by pistons fitting closely into the holes. The pistons are provided with short, thin stems extending into the center of the compressed mass, and forming the cavities for taking up the fuse. The cakes are now exposed to a current of hot air until they are hardened sufficiently. They are covered with several layers of thick paper, dipped into melted paraffine to protect them against the effects of moisture, and packed for shipment.—*Chemiker Zeitung.*

A Curious Property of Heat.—Mr. C. J. Henderson has been conducting some experiments lately in Edinburgh with a view of finding out what is the most economical way of heating a public hall, and has decided that the best results are to be obtained by using an accumulator or stove-room, where the heat, generated by any means whatsoever, is collected, and from which it is discharged through one opening about three or four feet square and seven or eight feet from the floor. The experiments unexpectedly exhibited with what instantaneousness and equality heat is transmitted through space independent of the direction in which the entering heated air is moving; four thermometers were placed at the same height on each of the four walls of the hall which was to be heated, and it was found that just as the heated air entered from the stove-room so the mercury in the several thermometers rose, whether they were hung on the same wall in which was the opening to the stove-room, or on the north wall, 50 feet away.—*Scientific American.*

Absorption of Water by Wood.—E. J. Maumene finds that the absorption power varies in different woods, when dried in a vacuum, between 9.37% and 174.86%. The maximum, 174.86%, or seven-fourths of its own weight, is found in chestnut timber. The moisture contained in wood, in its ordinary state, varies between 4.61% and 13.56%. The absorption power varies but little in different samples of the same wood.—*Les Mondes.*

The Velocity of Light.

There are now in progress at the Naval Academy, Annapolis, preparations for a scientific investigation of an interesting character. Ensign A. A. Mitchelsoa, U. S. N., having delivered a lecture upon "Light" before the association of scientists, made in preparation for it a series of investigations that induced him to believe that he could determine more accurately than is now known the velocity with which light travels, the two accepted computations differing about a thousand miles in the distance asserted to be traveled in a second. Under orders from the Navy Department, Mitchelsen has erected the apparatus to determine his theory practically.

The plan is essentially that used by Foucault, with the exception that a lens of great focal length, and a plane mirror, are used instead of a concave one. This arrangement permits the use of a considerable distance, and consequently gives a longer interval of time, which insures greater accuracy. The displacement of the image of a slit is the quantity to be measured, and this in Foucault's experiments was a fraction of a millimeter, and in the velocity of light could not be determined with any greater accuracy than could this displacement, which would be a fraction of one per cent. In the experiments made by Mitchelson the displacement has been increased to over 100 millimeters; hence the error introduced by this measurement would be less than one-thousandth of the whole, or less than 20 miles.

Another, though not an essential feature, is the use of a tuning fork, bearing a mirror on one prong, and kept in motion by a current of electricity, by means of which the speed of the revolving mirror can be ascertained with the same degree of precision. The mirror is put in motion by a blast of air furnished by a small rotary blower, which is driven by a steam engine. By this means a very steady speed is maintained. The entire apparatus is nearly finished, and in a short time observations will be commenced at Annapolis.—*Journal of the Franklin Institute.*

Do Gold Nuggets Grow?—A startling theory has been advanced by Mr. G. Attwood, in a paper read before the Chemical Society of England, which will make experienced California miners shake their heads. Mr. Attwood asks, do gold nuggets grow? and answers by assuming that they do, owing to the accumulation of fresh particles of finely precipitated gold. At Guayaua, Venezuela, a large area of alluvial soil has been found to contain gold, and nuggets up to 25 ounces have been discovered within three feet of the surface. Quite one-half of these nuggets are covered with a dark-brown substance "resembling a silicate of iron." By treating such a nugget with hydrochloric acid and caustic soda, it was found to be diminished considerably in weight. During this dissolving process much gold, in a finely divided state, became attached, and after this treatment the nugget was partly covered with a coating of finely divided gold of dull color.

New Voltaic Battery.—M. A. Heraud uses chlorohydrate of ammonia and calomel. When this circuit is closed the chlorohydrate of ammonia, in the presence of zinc, forms a chloride of zinc with the transference of ammonia and hydrogen to this positive electrode. The hydrogen reduces the calomel, yielding metallic mercury, chlorohydric acid, and consequently chlorohydrate of ammonia. As long as there remains any of the calomel about the positive electrode the chlorohydrate of ammonia will be regenerated. In a battery of nine elements the intensity was 0.73 at the end of 227 days, and 0.50 at the end of 984 days, the primitive intensity being one. When compared to sulphats of copper the mercury gave an intensity of 1.4512 at the beginning, and 1.0749 after six months' use.—*Comptes Rendus.*

An Electric Blowpipe.—M. Jamin remarks that the electric arc which plays between two carbon conductors is a true current. If submitted to the influence of a neighboring current, of a solenoid, or of a magnet, it experiences an action regulated by the laws of Ampere, identical with that experienced by any metallic conductor put in its place, but as its mass is exceedingly trifling its speed is considerable. The author takes advantage of this fact to submit small quantities of matter to an intense heat. By causing the arc to be driven upon lime, magnesia or zirconia, the light is directed downwards and its intensity is increased at least three-fold.—*Comptes Rendus.*

Siliciuret of Iron.—The committee of chemical arts of the French *Societe d'Encouragement pour L'Industrie Nationale* has undertaken the examination of the uses which can be made of this new compound. Prof. Lawrence Smith sent them an ingot weighing about three kilogrammes (6.6 pounds), with a color like platina and a specific gravity of 6.5. It is easily broken by the hammer, does not rust in the air, is not corroded by concentrated nitric acid, and scarcely by any reagents except fluorhydric acid and melted alkalies at a red heat.

Dew.—Mr. George Dines, who has made extensive experiments and observations on the formation of dew, finds that the depth of deposit in England in an evening rarely exceeds a hundredth part of an inch; and that the average annual depth of the dew deposited upon the surface of the earth does not exceed an inch and a half.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May. 1.		Week Ending May 8.		Week Ending May 15.		Week Ending May 22.	
Alpha	20	19	19	17	17	14	23	18
Alta	6¾	5⅞	6½	5	6¾	5⅞	8½	7½
Andes	45c	35c	40c	25c	25c	20c	50c	25c
Alps	....	....	....	....	....	....	....	....
Argenta	1½	1.40	1½	1.20	1½	1.10	1.20	70c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	25c	15c	....	....	....	....	20c	....
Baltimore Con	....	....	1	80c	....	....	1	50c
Belcher	7	5¾	6½	4½	5½	3¾	6	5
Belmont	25c	20c	40c	....	40c	30c	40c	30c
Best & Belcher	16⅝	16½	17	14½	14½	12½	19½	14⅞
Bullion	5⅞	5½	5½	4½	4.30	3½	7½	4⅝
Bechtel	1⅛	95c	1.10	90c	1	60c	2	1
Belle Isle	40c	35c	35c	....	40c	30c	60c	35c
Bodie	9½	8⅞	9⅝	9½	9¾	9½	17½	12
Benton	4⅞	4.15	4.35	3½	4.40	3.40	5	4.35
Bulwer	22	18½	12½	11⅞	12	10½	11⅞	10⅞
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.80	2	2.15	2	1.90	1¼	1.80	1.60
Belvidere	1.40	1.20	1.10	75c	75c	55c	1	75c
Booker	55c	35c	50c	45c	30c	20c	45c	35c
Caledonia	2	1.85	1.95	1½	2	1.20	2.35	2
California	7	6⅞	7½	6¼	7½	6⅝	7½	6⅞
Challenge	3.10	2⅞	2⅞	2½	2½	2	2.95	2.60
Chollar	6½	5⅝	6½	6	5¾	4.70	7⅝	6½
Confidence	14⅞	13½	15	11	12⅝	9	14⅞	12¾
Con Imperial	1½	1.40	1.40	1.20	1½	1.05	1.65	1.40
Con Virginia	6⅞	6⅝	7⅜	6⅞	7½	6¾	7⅝	6⅞
Crown Point	5⅝	4.90	5⅝	3.95	4.40	3.60	5⅝	4.60
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	10c	20c	10c	15c	10c	25c	20c
Concordia	20c	....	....	....	10c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	60c	40c	50c	40c	55c	40c	70c	60c
Eureka Con	16	14½	18	17½	16¾	16	18	17½
Exchequer	5½	5⅝	5½	4.95	4¾	3.65	8½	5⅛
Endowment	....	....	....	....	20c	15c	25c	20c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3½	3½	3.45	3.30	3½	3.20	3½	3
Gila	35c	30c	10c	....	10c	....	20c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	9	....	13½	10	14	13	14	13
Goodshaw	30c	....	25c	....	25c	....	40c	25c
Gould & Curry	9¼	8⅞	9⅝	7⅝	8¼	6½	10½	8⅞
Hale & Norcross	12½	11½	12⅝	10½	12½	10	15½	13½
Hillside	2¾	2.40	2½	2.15	2.15	1⅞	2½	2.20
Highbridge	35c	10c	30c	25c	85c	25c	35c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	15c	....	20c	....	15c	....
Independence	3	2.90	2⅞	2½	3.10	2.80	2⅞	2.60
Julia	4	3.60	3.90	3	3.40	3½	4½	3.60
Justice	4.15	3.70	3.80	3	3½	2½	3.85	3.15
Jackson	6½	6	6½	6½	6	....	6	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4⅞	4.65	4.60	4	4	3.60	5	4
Kossuth	....	....	....	....	....	....	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	95c	70c	70c	50c	55c	40c	70c	50c
Lady Wash	1½	1.15	1.20	1	1.35	1	1.45	1½
Leopard	1.60	1½	1½	1½	1.40	1.15	1.40	1
Leviathan	65c	55c	75c	60c	60c	50c	75c	55c
Leeds	75c	60c	75c	70c	70c	....	75c	60c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2½	2.40	2.55	2½	2½	2	2½	2.30
Martin White	6	5⅞	6	5⅞	7	6⅝	....	....
McClinton	1	85c	1	90c	80c	60c	1	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	37½	34½	37⅝	31	32	27	37⅝	34
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	11½	10	11⅝	9	10	7½	10½	9½
New York	75c	65c	70c	55c	60c	40c	70c	55c
Northern Belle	7	6½	7½	7	7⅛	6¾	7	6¼
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	15c	20c	....	20c	10c	20c	15c
Occidental	....	....	....	....	75c	....	....	....
Ophir	37	27	38½	31½	36½	31½	42	35½
Oriental	50c	....	....	....	50c	....	90c	50c
Overman	10⅛	9⅞	9⅞	7	8	6½	10	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	45c	40c	45c	40c	45c	40c	85c	60c
Potosi	4	3¾	3.90	3.30	3½	2	4.90	3½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4	3½	3½	3	3	2.60	3½	2¾
Richer	70c	....	55c	....	30c	25c	60c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11	9⅞	11⅛	9⅞	11⅞	8½	13½	11½
Seg Belcher	28½	25	25	....	23	22	27	26
Sierra Nevada	52½	47	52½	42½	45	40	50½	44½
Silver Hill	1½	1½	1.30	1⅛	2	1.30	2½	2.05
Silver King	8½	8	8	....	8	....	8¼	8⅛
Silver Prize	....	....	....	....	....	....	....	....
Succor	35c	25c	40c	30c	50c	20c	55c	20c
Summit	2.10	2	2	1⅞	2	1	2	1½
Scorpion	2½	2.10	2.30	1.95	2.55	2	4.10	2.60
Solid Silver	30c	25c	25c	20c	25c	....	15c	....
South Bodie	40c	35c	50c	35c	40c	35c	50c	35c
South Standard	20c	....	15c	....	....	....	....	....
Star	50c	40c	50c	....	45c	40c	50c	....
St. Louis	30c	....	....	....	....	....	30c	....
Syndicate	2	....	2½	2	2⅞	2.55	3½	2.90
Tioga Con	2.70	2	2.30	1.90	2.36	2.10	3.30	2.30
Tiptop	75c	60c	80c	75c	80c	75c	85c	75c
Trojan	10c	5c	5c	....	25c	5c	30c	20c
Union Con	75	69½	74½	64½	69	53	77	68½
Utah	16¾	14½	16	13	13½	11½	19½	14
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.15	1	1.15	85c	1.15	50c	1.30	1
Wells-Fargo	10c	5c	10c	5c	....	....	5c	....
Woodville	30c	20c	25c	....	20c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	18	16⅝	16⅞	13½	14½	13	19	15⅞

Sales at S. F. Stock Exchange.

Friday A. M., May 16.

200 Alpha....18@18½
120 Andes....30@25c
460 Bullion....4⅝@4.65
200 Baltimore Con....50c
250 Belcher....5⅝@5½
295 Best & Belcher....14¾
840 Benton....4.40@4⅝
115 California....6¾@7
1500 Con Virginia....6⅝@7
50 Chollar....6⅞@7
285 Confidence....13½@13¾
1340 Challenge....2.70@2⅞
1580 Con Imperial..1.40@1.45
615 Crown Point....4⅞@4.60
765 Caledonia....2.05@2
200 C Dorado....2.55
305 Exchequer....5½@5⅜
1225 Flowery....90@85c
1040 Gould & Curry....8⅝@8⅞
215 Hale & Nor....13½@13⅝
795 Julia....3.60@3¾
130 Justice....3¼@3.15
250 Kentuck....4@4½
400 Leviathan....55@60c
130 Lady Wash....1.40@1⅞
200 Lady Bryan....65c
290 Mexican....34@34⅞
250 Mackey....1.36@1¾
1460 N Bonanza....2@1.95
290 North Con Vir...10½@10¼
880 New York....60@55c
1110 Ophir....40@39½
50 Overman....8⅞@8⅝
250 Phil Sheridan....70@75c
525 Potosi....3½@3.90
600 Peytona....1
1430 Silver Hill....2.10@2.20
130 Savage....11⅛@11⅞
1270 Succor....55@50c
1150 Scorpion....2.60@2.70
275 Sierra Nevada....45½@44½
470 Trojan....25@30c
125 Utah....14@14½
180 Union Con....68¾@69½
200 Wells-Fargo....5c
700 Ward....1
165 Yellow Jacket....15⅞@16

AFTERNOON SESSION.

1100 Argenta....1.20
200 Albion....30@35c
100 Belmont....40c
460 Bodie....13@13⅞
500 Belvidere....1
170 Bulwer....11@11⅞
770 Black Hawk....1.60@1⅞
225 Booker....45c
1430 Bechtel....1@1.10
260 C Pacific....2.95@2⅞
100 Champion....20c
400 Caledonia (B H)....3.60
1350 Day....60@70c
1275 Dudley....50@55c
40 Eureka Con....17½
500 Fourth July....40c
20 Grand Prize....3.20
450 Goodshaw....25@30c
600 Giant & O A....5
65 Golden Terra....14@13
600 Highbridge....30@35c
150 Hillside....2¾@2.20
250 Hamburg....50c
300 Independence....2⅞
50 Jackson....6
450 Jupiter....45@40c
200 Leopard....1.35@1.30
510 Manhattan....2½
940 Mono....4@3.95
570 McClinton....75@70c
395 Northern Belle....7@6¼
100 Noonday....2.30
1300 Oriental....70@75c
25 Real del Monte....4
500 Star....50c
500 S Bulwer....50c
10 Silver King....8½
155 Summit....1.70@1.80
300 Syndicate....3@2.90
800 S Bodie....35@40c
500 Tuscarora....50c
1050 Tiptop....75@85c
350 Tioga Con....2.30@2.40
1300 Vortex....75@70c

Saturday A. M., May 17.

335 Alpha....18½@18¾
250 Alta....7½@7⅝
300 Andes....25c
540 Argenta....1.15@1.10
300 Albion....30@35c
255 Best & Belcher...17@17½
385 Belcher....5⅜@5⅝
200 Black Hawk....1.70
170 Bechtel....1.05@1
150 Booker....40c
1830 Bullion....4.90@5⅛
370 Benton....4.35@4.45
85 Belmont....40c
300 Bodie....12
1000 Belle Isle....40c
300 Belvidere....1
410 Crown Point....5@4.85
520 Con Virginia....7⅝
430 Chollar....6⅝
750 California....7
830 Con Imperial....1.40
80 Confidence....14¾@14
610 Caledonia....2½@2.35
450 Challenge....2.60@2.70
150 C P Ravine....15@20c
180 Con Dorado....2.30
200 Champion....20c
600 Caledonia (B H)..4@3.90
525 C Pacific....2⅞@2.95
400 Day....65c
60 Dudley....55@60c
1975 Exchequer....6½@6
1950 Flowery....90@80c
100 Fourth July....40c
500 Gould & Curry....9½@9⅜
600 Gila....15c
45 Grand Prize....3½
200 Golden Terra....13¾@14
1090 Giant & O A....6
495 H & Norcross....13⅞@14
50 Hillside....2½
100 Highbridge....35c
310 Justice....3.40
830 Julia....3.80@3⅞
150 Jupiter....40c
160 Kentuck....4½@4.40
50 Kossuth....10c
455 L Wash....1.30@1¼
460 Leviathan....60@65c
250 L Bryan....65c
310 Leopard....1.35
50 Leeds....60c
785 Mexican....36@35⅞
550 Mackey....1.40@1.55
40 Manhattan....2.45@2.40
120 McClinton....65@60c
500 Mono....3½@3.40
800 New York....60@65c
50 N Con Virginia..10¾@10½
100 Navajo....20c
1180 N Bonanza....1.70@1.80
300 Noonday....2.10
300 N Noonday....80c
1350 Ophir....40@41½
75 Overman....9½@9¾
950 Oriental....75c
470 Potosi....4½
765 Phil Sheridan....65@75c
300 Peytona....1
400 Paradise....1.40
100 Raymond & E....2.90
380 Real del Monte....3½@3
400 Star....50c
250 Syndicate....3
650 Summit....1.70@1½
200 South Bodie....45@40c
100 Savage....11⅞
510 Sierra Nevada...47½@46½
1150 Succor....50c
1100 Silver Hill....2½@2.05
815 Scorpion....2.65@2.60
100 S Bulwer....60c
50 St Louis....30c
650 Trojan....25c
300 Tuscarora....10c
700 Tioga....2½
740 Tiptop....75c
340 Utah....14¾@14½
1550 Vortex....75@70c
520 Wells-Fargo....5c
1445 Ward....1@1.10
375 Yellow Jacket....17@16½

Monday A. M., May 19.

75 Alpha....20@20½
445 Alta....8
210 Andes....40@50c
770 Benton....4.60@4½
665 Belcher....6@5⅞
495 Best & Belcher....19½
1055 Bullion....6@6¼
170 Confidence....14½@14¼
2695 Con Imperial....1.55@1½
555 Crown Point....5½@5⅜
1270 California....7½@7
1810 Con Virginia....7½@7⅝
1300 Challenge....2.85@2⅞
200 C Dorado....2.45
570 Caledonia....2½@2.45
610 Chollar....6⅞@7⅛
1320 Exchequer....7@7⅛
970 Flowery....85c@1
615 Gould & Curry....9⅞@10
170 Hale & Nor....14⅞@14½
915 Justice....3.85@3¾
1545 Julia....4.20@4.05
200 Kentuck....4.95@4⅞
300 Lady Wash....1.35@1¼
350 Lady Bryan....50c
170 Mexican....36@35⅞
650 N Bonanza....1.90@1.95
470 New York....70@65c
215 North Con Vir....10½@10
350 Ophir....41½@42
250 Overman....9⅝@10
300 Peytona....1
450 Phil Sheridan....60@65c
140 Potosi....4.65@4⅞
100 Savage....12⅛@12½
10 Seg Belcher....26
290 Sierra Nevada....50@49½
1350 Silver Hill....2.40@2.20
50 Solid Silver....15c
650 Succor....50@45c
390 Scorpion....2.95@2.60
300 Trojan....30@25c
340 Union Con....71½@72½
295 Utah....19@18⅞
2190 Ward....1.10@1.30
1165 Yellow Jacket....17½@18½

AFTERNOON SESSION.

1310 Argenta....1.10@1
700 Albion....30c
150 Belmont....40c
565 Bodie....15@14⅞
1535 Bechtel....1.10@1.05
105 Bulwer....11
500 Belvidere....90@95c
1730 Belle Isle....40@35c
635 Black Hawk....1.70@1⅞
650 Booker....35@40c
350 C Pacific....3
725 Caledonia (B H)....4
1250 Day....60c
500 Dudley....60@50c
115 Eureka Con....17½@18
500 Endowment....25c
400 Gila....15c
150 Grand Prize....3.10@3
50 Golden Terra....14
200 Hussey....15c
400 Highbridge....30c
250 Hillside....2.20@2½
120 Independence...2¾@2.60
250 Jupiter....60c
940 Leopard....1½@1.40
300 Leeds....60c
145 Manhattan....2½@2.40
425 McClinton....75@65c
905 Mono....4
190 Northern Belle....6½@6¾
50 Navajo....20c
350 Noonday....2½@2.15
660 N Noonday....70@75c
1625 Oriental....80@50c
500 Paradise....1.45@1½
150 Raymond & Ely.2¾@2.80
200 Richer....60c
750 Star....50c
980 Summit....2@1⅞
100 S Bodie....40c
175 S Bulwer....50@40c
615 Tioga Con....2.90@2⅞
900 Tipton....75c
550 Vortex....75@70c

Tuesday A. M., May 20.

320 Alpha....20@21½
210 Alta....7⅞@7⅝
390 Andes....35@45c
835 Belcher....5¼@5½
275 Best & Belcher....19@18⅞
610 Benton....4⅜@4½
1535 Bullion....6⅞@7
400 Baltimore Con....1
350 Caledonia....2½@2.20
1195 Con Virginia....7½@7
160 Confidence....13@12½
505 Chollar....6⅞@7
285 California....6⅞
2125 Con Imperial....1.45@1½
955 Crown Point....5½@5
100 Challenge....2.85@2⅞
2325 Exchequer....7½@7½
745 Flowery....90@95c
460 Gould & Curry....9⅞@9⅝
275 H & Norcross....15½@15½
525 Justice....3¾@3½
925 Julia....4.15@4.05
130 Kentuck....4⅞
930 L Bryan....65c
765 Lady Wash....1⅜@1.40
50 Leviathan....70c
700 Mexican....36@35½
280 Mackey....1½@1.55
150 Mt View....4.40@4⅞
1630 N Bonanza....1.90@2
580 New York....60@65c
240 North Con Vir....9½@10
1250 Ophir....38½@39½
375 Overman....9½@9½
175 Potosi....4.90@4.65
885 Phil Sheridan....70@75c
405 Savage....12⅞@12⅞
195 Sierra Nevada....49½@50
1275 Silver Hill....2½@2.10
300 Succor....30@20c
200 Solid Silver....16c
1100 Scorpion....3@2.95
200 Trojan....30c
250 Union Con....70@68½
115 Utah....18@18⅞
1650 Ward....1.15@1.20
325 Yellow Jacket....17½@17½

AFTERNOON SESSION.

1050 Albion....30@25c
1280 Argenta....75@70c
200 Aurora T....20c
500 Adenda....1
5700 Belle Isle....40@50c
590 Belvidere....90@75c
110 Bulwer....10¾@11
730 Bodie....16⅞@17½
775 Bechtel....1⅞@1.85
360 Booker....35@40c
775 Black Hawk....1.80@1⅞
50 Belmont....30c
600 Champion....20@25c
950 C Pacific....3@3¼
815 Caledonia (B H)....4½@4⅛
340 Day....60c
250 Dudley....55c
800 Endowment....25@20c
350 Gila....15c
525 Grand Prize....3
250 Goodshaw....40@35c
50 Golden Terra....13½
730 Giant & O A....6
1050 Hussey....15c
100 Highbridge....25c
450 Independence....2⅞@2.65
600 Jupiter....40@50c
500 Leopard....1¼@1.10
320 Manhattan....2.30
700 McClinton....75@80c
40 Mono....5
100 Navajo....15c
40 Northern Belle....6½
250 Noonday....2@2.10
90 N Noonday....70c
1400 Oriental....85@75c
100 Paradise....1½
250 Raymond & Ely....3@3¼
50 Real del Monte....2½
350 Star....50c
775 Syndicate....3
605 Summit....2@1.90
1225 S Bodie....40@45c
270 S Bulwer....55c
50 Silver King....8½
680 Tioga....3.30@3¼
2050 University....30c
300 Vortex....75c

Wed'sday A. M., May 21.

330 Alpha....23@22
520 Andes....45@40c
450 Alta....8⅛@7⅞
415 Belcher....5@5¼
1650 Bullion....6⅞@7
100 B & Belcher....19@18½
1545 Benton....4⅞@5
2300 Con Dorado...2.30@2.40
100 California....7
2190 Con Imperial..1.60@1.55
665 Con Virginia....7@6⅞
150 Crown Point....5¼
210 Chollar....6⅝@6½
375 Caledonia....2.30@2¼
485 Challenge....2.95@2⅞
690 Confidence....14½@14¼
1975 Exchequer....8@8½
1610 Flowery....1
500 Green....75c
410 Gould & Curry....9⅞@9⅞
295 Hale & Nor....15@14⅞
140 Justice....3⅞@3.70
695 Julia....4.15@4¼
120 Kentuck....5
265 Lady Wash....1.30@1.40
1050 Leviathan....65@70c
720 Lady Bryan....60c
300 Mexican....37@37½
420 Mackey....1⅝@1.70
875 N Bonanza....2¼@2.60
175 North Con Vir....9⅞
525 New York....60@65c
105 Ophir....37½@37
105 Overman....9@8⅞
20 Phil Sheridan....85c
1110 Potosi....4@4½
320 Savage....13@13½
610 Sierra Nevada...49½@49⅞
10 Seg Belcher....27
980 Succor....25@20c
1155 Silver Hill....2.40@2½
1070 Scorpion....3@3.10
700 Solid Silver....15c
100 Trojan....25c
245 Union....70@69⅞
90 Utah....18@17⅞
700 Ward....1¼@1.20
1220 Yellow Jacket....18½@19

AFTERNOON SESSION.

300 Albion....25c
990 Argenta....75@90c
200 Belmont....40c
3310 Belle Isle....45@60c
810 Bechtel....2@1.55
590 Bodie....17@16½
305 Bulwer....10⅞@11
710 Booker....35@40c
830 Black Hawk....1⅞@1.80
790 Belvidere....90c@1
850 Con Pacific....3¼@3.40
550 Champion....25c
1000 Crœsus....10c
710 Caledonia (B H)....4@3⅞
1500 Day....65@60c
450 Dudley....50@55c
180 Eureka Con....17½@18
1500 Endowment....25c
150 Golden Terra....13½
150 Gila....20c
350 Grand Prize...3.10@3.05
500 Goodshaw....40c
500 Hussey....15c
300 Independence....2⅞
170 Jackson....6
300 Jupiter....40@50c
1000 Leopard....1.10@1
100 Leeds....75c
250 Manhattan....2.30@2½
395 McClinton....90c@1
1015 Mono....4@3⅞
190 Northern Belle....6½@6⅞
350 Noonday....2½@2.05
1000 N Noonday....75c
1150 Oriental....90@85c
100 Paradise....1.45
470 Raymond & Ely....3¼@3
350 Real del Monte....2½
200 Star....50c
350 Summit....1.90
255 Syndicate....3@3¼
770 S Bodie....50@35c
150 S Bulwer....55c
430 Tioga Con....2⅞
100 Tiptop....75c
1250 University....30@40c
600 Vortex....75c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Booker Con G M Cn	California	2	25	Apr 28	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Cn	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Cn	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willie	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 31	H A Whiting	211 Sansome st
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
Panther M Co	Nevada	11	10	Apr 3	May 7	May 28	J W Pew	310 Pine st
Trojan M Co	Nevada	10	25	Apr 9	June 2	June 23	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Tuscarora M & M Co	Nevada	3	05	Mar 27	May 5	May 30	M E Sperling	309 California st
Union Con S M Co	Nevada	12	1 50	Apr 2	May 5	May 24	J M Buffington	309 California st
Yellow Jacket S M Cn	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	May 12	June 11	Jno Crockett	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Cn	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Cn	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Globe Con M Co	Nevada	11	10	Mar 29	Apr 30	May 26	O H Bogart	106 Leidesdorff st
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Lewis Con S M Co	Arizona	1	02	Mar 26	May 3	May 26	J W Pew	310 Pine st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
Mt Jefferson M & M Co	California	6	05	Mar 21	May 2	May 27	R N Van Brunt	318 Pine st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Queen Bee M Co	California	3	10	April 22	May 26	June 16	T A White	113 Leidesdorff st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Seg Europa M Co	Nevada	1	25	Apr 4	May 24	June 9	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Sophia G M Co	California	1	02½	Apr 23	May 26	June 13	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 6	T W Colburn	414 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Hussey Con G & S M Co	Nevada	Jno E Dixon	327 Pine st	Annual	May 26
Silver Hill M Co	Nevada	W E Dean	203 Bush st	Annual	May 26
St Luis M Co	——	W E Dean	203 Bush st	Annual	June 2
Tyho Con M Co	Nevada	Wm M Parrish	328 Montgomery st	Annual	June 4

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., May 15.

130 Alpha....16½
160 Alta....6⅞
250 Andes....20@25c
235 Best & Belcher..14½@14⅞
430 Belcher....5@5⅛
600 Bullion....4½@4.35
230 Benton....4½@4.35
215 California....6¾@7
750 Crown Point....4.40
500 Con Imperial....1.20
160 Chollar....5½
1058 Con Virginia....6⅞@6⅞
345 Confidence....12@12⅛
220 Caledonia....1.95@2
220 Challenge....2⅛@2.40
350 C Dorado....2.35
300 Exchequer....4⅞
775 Flowery....75@70c
595 Gould & Curry....8⅛@8⅛
185 Hale & Nor....12½@12⅛
220 Justice....3.20@3¼
50 Julia....3.35@3.30
50 Kentuck....4
650 L Bryan....45@50c
330 Lady Wash....1.30@1.35
100 Leviathan....55c
400 Mexican....31½@32
50 Mt View....5
225 Mackey....1.15@1.10
900 New York....55@60c
40 N Con Vir....10
1350 N Bonanza....1.40@1.56
950 Ophir....36½@36¼
50 Overman....7⅞
120 Potosi....3.05
130 Phil Sheridan....45c
155 Savage....11@11¼
90 Sierra Nevada....44½
850 Succor....40@50c
590 Silver Hill....1.80@1⅞
455 Scorpion....2½@2.55
150 Solid Silver....25c
100 Trojan....25c
65 Utah....13@13¼
305 Union Con....69@68
185 Ward....95c@1
270 Yellow Jacket...14¼@14½

AFTERNOON SESSION.

200 Albion....30c
930 Argenta....1¼@1.20
365 Bodie....11
830 Bechtel....85@90c
500 Belle Isle....40c
270 Booker....45@50c
610 Belvidere....75@90c
300 Black Hawk....1½@1.40
164 Bulwer....10½@11½
700 C Pacific....2.80@2.85
300 Caledonia (B H).3.60@3½
255 Day....40@70c
110 Eureka Con....17½@18
100 Giant & O A....6
10 Grand Prize....3.20
500 Independence....2.80
200 Jupiter....40c
200 Leeds....70c
1000 Leopard....1.35@1.40
615 Mono....3¾@3.70
30 McClinton....70c
105 Manhattan....2½@2.40
70 Northern Belle....7
400 Navajo....20c
150 Noonday....2.35
930 Oriental....50@60c
30 Raymond & Ely....3
150 Silver King....8
560 S Bodie....1.35@1.30
650 S Bulwer....50@40c
150 Summit....1.85@1.90
400 Star....45c
100 Tuscarora....10c
265 Tioga Con....2½@2
150 Tiptop....75@80c
1100 Vortex....70@60c

Thursd'y A. M., May 22.

480 Alta....8@7⅞
285 Alpha....22@22½
475 Andes....40@45c
205 Belcher....5⅜@5¼
145 Best & Belcher....18½
1580 Bullion....7@7⅛
225 Benton....4.80@4.85
2310 Con Imperial..1.60@1.65
585 Crown Point....5½@5⅜
260 Confidence....14½@14⅞
785 California....6⅞@7
140 Chollar....6⅞@6⅞
1955 Con Virginia....6⅞@7
85 Caledonia....2.35
530 Challenge....2.65@2.80
1900 Con Dorado....2.10@2½
1489 Exchequer....7⅞@8
1670 Flowery....1.10@1¼
370 Gould & Curry....10@10⅛
220 Hale & Nor....14½@14⅞
180 Julia....4.10@4
320 Justice....3⅞
200 Kentuck....5
1230 Lady Bryan....65@70c
450 Lady Wash....1.40@1.45
370 Leviathan....75@70c
255 Mexican....37@37½
700 Mackey....2.10@2.20
640 New York....65@70c
555 North Con Vir...10½@10½
685 N Bonanza....2.30@2½
950 Ophir....35½@36
910 Overman....9@9½
200 Phil Sheridan....75@85c
55 Potosi....4.70
340 Savage....12½@12⅞
130 Sierra Nevada....50@50½
200 Succor....30c
1005 Silver Hill....2.40@2½
1460 Scorpion....3.95@4.10
200 Solid Silver....15c
250 Trojan....20@25c
540 Utah....18@19½
390 Union Con....75@77
50 Woodville....25c
1200 Ward....1.30@1½
930 Yellow Jacket....19@18½

AFTERNOON SESSION.

975 Argenta....90@95c
700 Albion....25c
400 Belmont....40c
1000 Belle Isle....60@70c
670 Bodie....20@21
315 Bechtel....1⅞@1.80
260 Bulwer....11½@11⅞
300 Booker....40c
400 Black Hawk....1½
730 Belvidere....1@85c
200 Champion....25c
850 C Pacific....3.80@3¾
285 Caledonia (BH)..4½@4.10
1000 Crœsus....10c
600 Dudley....60@55c
600 Day....55@60c
185 Eureka Con....17⅞@18
250 Golden Terra....14
250 Gila....20c
115 Grand Prize....3.15@3¼
350 Giant & O A....7
850 Goodshaw....60@45c
100 Highbridge....25c
100 Hussey....10c
385 Independence..2.90@2.95
250 Jupiter....40c
200 Leopard....1
30 Leeds....70@75c
20 Manhattan....2½
350 McClinton....1
400 Mono....5¼@5½
175 Noonday....2
100 N Noonday....75c
180 Northern Belle....6½
1425 Oriental....70@90c
200 Orient....15c
345 Raymond & Ely....3
500 Star....50c
310 Summit....1.80@2
195 Syndicate....3¼@3½
325 S Bulwer....55c
170 S Bodie....40c
345 Tioga Con....2.60@2½
50 Tuscarora....10c
1150 University....40c
1400 Vortex....70@75c

Pacific Board—Latest Sales.

Wed'sday A. M., May 21.

70 Alpha....22½
110 Alta....8@8½
410 Bullion....7¼@7½
255 Belcher....5½@5.20
60 Best & Belcher....19½
650 Con Imperial..1.60@1.66
210 Con Virginia....7@7.20
125 California....6.90@6⅞
60 Chollar....6⅞
30 Crown Point....6.15
50 Challenge....3
820 Exchequer....8⅞@8⅞
200 Gould & Curry....9⅞@10
50 Hale & Nor....15½
220 Julia....4.10@4½
20 Kentuck....5
30 Mexican....37½
180 Ophir....37½@37⅞
50 Potosi....4½
130 Savage....13½@13¼
20 Sierra Nevada....50
20 Utah....18
10 Yellow Jacket....19

AFTERNOON SESSION.

40 Alta....8⅝@8½
110 Bullion....7⅝@7.55
200 Bechtel....1.60@1.55
10 Best & Belcher....19⅝
10 Belcher....5⅝
20 Crown Point....5⅞
345 Con Imperial....1.65@1⅝
5 California....6⅞
250 Challenge....3
50 Caledonia....2½
20 Confidence....15
390 Exchequer....8⅞
300 Flowery....1@1.15
110 Gould & Curry...10⅜@10⅞
50 Goodshaw....40c
90 Julia....4.20
70 Justice....3¾@3.80
150 Lady Wash....1½
200 Mackey....2@2⅛
50 Mexican....38@38½
60 New York....70@65c
125 N Bonanza....2½
60 Ophir....39@38½
20 Overman....9½
50 Phil Sheridan....75c
160 Silver Hill....2½@2.45
30 Savage....13½
50 Scorpion....3.70
10 Utah....18
100 Ward....1¼@1.20
10 Yellow Jacket....19½

California Board—Latest Sales.

Wed'sday A. M., May 21.

20 Alpha....20½@20½
70 Alta....7½@7⅞
150 Andes....45c
50 Belcher....5½@5⅞
300 Boston....1½@1⅞
20 Best & Belcher...18½@18⅝
120 Bullion....6¾@6½
200 Brilliant....45c
500 Baltimore Con....55c
50 California....7@7½
30 Con Virginia....7
235 Con Imperial....1.55@1½
30 Crown Point....5½
70 Challenge....2.80@2.90
90 Caledonia....2.20@2¼
450 Crœsus....14c
700 Enterprise....1⅞
100 Endowment....20c
100 Exchequer....7⅞@7½
70 Gould & Curry....9⅝@9⅞
250 Hartford....1.70@1⅞
50 Hale & Nor....15½@15⅝
245 Julia....4.05@4.20
120 Justice....3¾@3.70
140 Leviathan....65c
60 Mexican....36@36½
50 New York....60c
60 Ophir....36⅝@36⅞
85 Potosi....4@4¼
150 Phil Sheridan....72½c
40 Savage....13½@13⅞
100 Senator....35c
20 Summit....2
100 Silver Hill....2.30
50 Silver Jacket....65c
375 S Bodie....40@45c
1000 S Utah....10@13c
30 Union....69½
1000 U Flag....4c
200 Vermont Con....45c
200 Wm Penn....45c
20 Yellow Jacket..17⅞@17⅝

AFTERNOON SESSION.

100 Andes....37½c
1250 Ætna....11@7c
100 Almaden Q....25c
100 Argenta....93c
100 Atlanta....2c
50 Alta....8⅞@8⅞
50 Alpha....23½@23⅞
40 Bullion....7½@7⅞
50 Best & Belcher....20@20½
10 Belcher....5⅞
500 Coso Con....5c
100 C Pacific....3.40
30 Chollar....6⅞@6⅞
80 Caledonia....2½@2⅞
70 Crown Point....5.20@5½
300 Con Imperial....1⅞@1.70

40	Con Virginia.............7	50	Mexican...............39¼
20	California...............7	100	Monumental..........3c
200	Enterprise..............1¼	100	New York...........67½c
70	Exchequer.........8¾@9	50	Ophir.............39@39½
200	Glynn Dale.............45c	20	Overman...............9¼
100	Golden Chariot.......10c	90	Potosi.........4.60@4.65
70	Gould & Curry...10¾@10½	100	S Bodie...............50c
30	Hale & Nor............15¼	50	Tiger....................1¼
60	Justice.........3.85@3.90	100	Trojan.................27½c
80	Julia...............4¼@4½	100	U Flag...................4c
140	L Bryan...............62½c	100	Wales.....................1

Mining Share Market.

If the promises of dealers and tho predictions of operators generally were infallible, we should have had a booming market during tho past week. The earlier portion was marked peculiarly by prophesios of this immediate inflation, but the facts as yot have failed to do more than sustain the confidenco that there is a better market to come—some time. Thero has been, to be suro, a rise in prices and more fluctuation than for some timo past, but the usual signs—the hitherto invariable forerunners of previous heavy turns in the market—havo been entirely wanting, and the activity displayed has really been littlo more than would ariso from the couvalescence of the market from the late election scare. Not that there may not he a heavy deal, and that very soon; indeed, the near approach of the Comstocks to tho "new bonanza" ground, the promised immediate completion of the Sutro tunnel, and the consolidation of stocks in firm, good hands points strongly to such a probability. But, as yet, it remains for this probability to become a reality. Action in the Comstocks has not been confined to any one particular section, but all three have displayed an almost equal amount of life. The Bodies, too, have been largely dealt in, and are noticeahle as not participating in Tuesday's fall. Other outside stocks have discovered streugth, and at present writing there is a steady upward movement in everything.

California Academy of Sciences.

A meeting of this society took place on Monday eveuing last, Dr. Harkness in the chair. Among the donations to the cabinet was an interesting specimen of fungus, which was found attached to the base trunk of the bay laurel. The texture of this fungus is very firm, its material having been used in lieu of cork, and when chemically prepared, forming an excellent material for the manufacture of slow fuse. Also, two specimens white marble, from Colton quarry, San Bernardino county, by J. M. Hutchings; one specimen agate, by Master Doble, Fremont street, San Francisco; gold quartz, Texas Flat mine, Fresno county; silver ore, San Juan mine, Pima county, Arizona; gold quartz and copper ore, Amador county, and gold quartz, Joe Davies mine, Trinity county, California—from R. H. Stretch.

W. N. Lockington read a paper descriptive of the new and rare fishes of tho Pacific coast. This was followed by a discussion on the organs of bearing in fish. A communication was received from Prof. Davidson, reporting that an astronomical party has taken the field with the view of establishing stations for the pursuit of astronomical observations at high altitude. This is elsewhere referred to in this issue of the Press.

A letter was read from Prof. Finck, of Bremen, now in New York and shortly to visit this city en route for the Sonth Seas, and the Academy was nrged by Dr. Stout to tender him a reception, and Messrs. Stout, Behr and Yale were appointed a committee by the chair to meet the gentleman and request bim to give to the Academy an outline of his intended researcbes in the South Seas. Prof. Finck is well-known from his Siberian explorations and now seeks new fields in a milder clime.

The Hope Iron Works.—The Hope Iron Works were projected by Mr. W. W. Hanscom, four years ago, for the carrying on of general machine and foundry business, as well as for special work and machinery. In building these works, they were fitted up with the best tools to be made in the United States, made expressly for Mr. Hanscom, by the celebrated firm of Bement & Son, Philadelphia, and consist of lathes from 7½ fect swing and 30 feet long, to 12 inches swing and 5 feet long, with planers, shaper-drills, slotting machine, bolt cutters, and a complete outfit of small tools, such as boring bars, reamers, drills, cutters, machine cutters, etc. The pattern shop has band and circular saws, lathes, etc., with air chucks, etc. The blacksmith shop has two forges and steam hammer, also of Bement & Son's manufacture, and all blacksmith tools. The foundry has a room 40x100 feet, with five-ton crane, eight-ton cupola core oven, with iron carriage and track leading under crane, full assortment of ladles, clamps, core plates, weights, flasks, etc., also independent blowing engine and Sturtevant blower. The works have ample capacity for 75 men, witb a good assortment of standard patterns, including vertical engines, propeller wheels, steam pumps and borizontal engines, gearing, boiler fronts, etc. This is a rare chance for any parties desiring to engage in the foundry and machine business.

Mining Summary.

The following is mostly condensed from journals published in tbe interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Drytown—Cor. *Dispatch*, May 17: Dr. Mayou has been trying to negotiate with the Crown Point company, for the working of that property. The present owners only got down on it some 125 or 130 ft, and the ledge is in fine looking formation. The Centennial mine has been stopped for the last two or three weeks, for the lack of funds, their rock being low grade, although looking splendidly. The Webster mine, joining the Potosi on the north, has been jumped by a party of Italians; mostly members of the Centennial company, and they are now sinking a shaft on it. When worked last, some years ago, the prospects were favorable. The Hercules mine is still idle, presumably because the parties interested below failed to send up tho cash. The prospects are not as favorable as they might be. The general belief is that L. Meiss, whose claim lies immediately east of them, has got the main ledge. Business has not yet been resumed at the Pennsylvania mine. The superintendent has been below for some time back, but probably they will start up again in a short time, as the property is too valuable, and the prospect too good to let it remain idle long.

Sutter Creek Notes.—The Mahoney is still sinking a perpendicular shaft to strike the main ledge at the depth of 1,000 ft. The company are expecting new machinery from the East at an early day, to be used in this sinking and for the future. The Con. Amador Co. havo advertised for bids to sink 100 ft on the new shaft of that mine. This company are now crushing the old "gouge dirt" taken from the mine. They crush about 160 tons per day which pays about $1 50 per ton.

BUTTE.

The Vermillion Mine.—*Mercury*, May 16: This property is located at Forbestown, commencing in tho edge of the settlement, and extending up Forbestown ravino to the line between Yuba and Butte counties. It contains about 100 acres of land, and was purchased by Messrs. Frank and Wm. Oerling, in the spring of '78. A company of Stockton capitalists have recently taken hold of the property and put in pumping machinery and pipe, and obtained a supply of water from the Gaskell ditch, 100 ft below the mine. The water is forced through 2,000 ft of pipe, up an elevation of 350 ft into a reservoir, from whence it flows to the mine under a pressure of 200 ft. These improvements have necessitated an outlay of $15,000.

Improvements.—Some weeks since, ono of the flumes belonging to the Hewitt claim tumbled to pieces, and Messrs. Brock & Taber were awarded a contract to make 750 ft of 30-inch pipo to take its place. Workmen are now engaged in placing the pipe in position. In its manufacture, 22,800 pounds of No. 14 iron and 500 pounds of riveta were used. The firm was only five days in filling the order.

CALAVERAS.

Collier Mine.—*Citizen*, May 17: This mine, owned by Mr. Collier and situated near Murphys, is now being worked and is turning out remarkably rich rock. The rock is crushed just as it is taken from the mine, without being assorted, tbe poorest of which more than pay expenses. As the mine is developed it shows a number one lead, and continues to improve in richness. A five-stamp mill has been erected on tbe mine, and is kept constantly running.

Mill Refitted.—Smith's mill, near Murphys, has recently been refitted and put in running order, and is now being run in full blast. The mill is composed of six stamps and is one of the best in the county.

Eho Hydraulic Claim.—This claim is situated in Eho mining district, between Murphys and the Stanislaus river. Curtis & Co. have been at work with the hydraulic and have uncovered a large area of rich gravel.

Bumble Bee Claim.—This claim, situated near Murphys, is owned by Wade and Freeman. Between six and seven tons are now on the dump, which will yield, on an average, about $15 per ton. They have a cut run into the hill 50 ft long and 12 ft in depth. At present they are engaged in sinking a shaft in the cut which covers the lead, the width of which, on an average, is one ft.

Boston Hydraulic Claim.—This claim is situated on Whisky hill about half a mile from Jenny Lind. E. F. Kendell, Superintendent of the mine, has 14 men employed besides several Chinamen. This claim is run by hydraulicing, and a large amount of ground is washed in a short time. The claim is paying well.

Buckhorn Claim.—The owners of this claim, situated near Murphys, on the grade leading to Altavills, have erected a one-stamp mill and two arastras, with which to crush the ore taken from their mine. The mine is owned by Haselton & Co., and from present appearances they have got a good claim.

Quartz Ledge Discovered.—*Chronicle*, May 17: Herbert and Warren, of Sandy Gulch, have lately discovered a very promising quartz vein near the South Fork of the Mokelumne, opposito Holmes' mill. The lead is narrow, but rich, good judges estimating that it will mill $8 per cargo. But little prospecting has been done yet, the proprietors not having completed preparations for active operations. A shaft has been commenced, however, and work will be urged forward shortly.

INYO.

Modock.—*Independent*, May 10: The tunnel on the 1000 level has been run in 1,585 ft. Shaft from 300 level sunk 19 ft; total depth to date, 401 ft. Upraise been raised 12 ft, giving total hight of raise 124 ft. Distance between top of raise and bottom of shaft, 38 ft. Fall of tunnel has broken into a clay gouge, carrying good indications for ore. Face and sides of tunnel are about four ft in this clay and ledge matter. Have had good ground for the past week. Could have no better indications for ore ground than now in face of tunnel. There should be very little ground between sbaft and upraise at the end of this week, and nothing can prevent good progress being made.

Darwin Items.—Ores are still coming in from Wildrose, Minnietta, and the Ygnacio mines. After this run is concluded, Superintendent Williams will continue on purchasing ores on the same favorable terms as heretofore. The Now Coso furnace was started up on May 1st, tho blast being turned on at 10 a. m. The furnace has been running steadily since the start. Messrs. Birchett & Parker, who have the Snow Canyon five-stamp mill leased for a season, have brought in between $4,000 and $5,000 in gold and silvor bullion, being the clean-up from a two weeks' run. A large proportion of the ores first worked by Messrs. Birchett & Parker came from the St. George, represented by Mr. Mason and the old Virginia property of Messrs. Grove & Mitchell. Mr. Mason reports the St. George as being down over 100 ft, and that ores taken from that depth for the preseut run, averaged $100 per ton in gold.

MONO.

Tioga.—*Standard*, May 17: Outside of Standard, Bulwer, and Bodie, no mining enterprise in the district possesses such a substantial showing for a long-lived, self-sustaining institution as tbe Tioga. Excellent machinery, good depth and all work of exploration in first-class shape. The ledge in west crosscut, 320 level, has not shown signs of failing at any point, and is now drifted on nearly 100 ft in length. The width of the ledge is nearly four ft, and grade of ore a profitable milling proposition. Chief interest is still centered on tbe corresponding crosscut, 520 level, now nearly 200 ft from shaft, in ground very favorable botb for rapid work and carrying ledges.

Mono.—On the 400 level, the joint crosscut on the Bodie line is in from the lateral drift 160 ft oast and 112 ft west. In the latter a fine vein wae cut during the past week, containing considerable ore. The east crosscut from the shaft, same level, is in 115 ft. The Mono vein was cut about 90 ft from the shaft, and was found considerably broken. Drifts are being run both north and south on this vein from this crosscut. The drift is altogether about 60 ft in length. A south drift is being run from the crosscut on the boundary line to connect with this drift.

Standard Con.—The north drift from the main shaft has been advanced 14 ft; total length, 182 ft. The ledge is four and a half ft wide, of very good ore. An upraise on this ledge is now 52 ft above the drift, where it shows four and a half ft of fine ore. The east crosscut from the south drift is in 72 ft; progress, 11 ft. The rock in the face is hard. The winze on the Cook ledge has reached a depth of 25 ft. The ledge is two ft wide, and looks well. The west crosscut, 700 level, is in 110 ft, and is at present in very hard ground. The south drift on the Oildea ledge is in 149 ft. The ledge is two and a half ft wide, of fair ore. The stopes are looking well. The bullion shipments for the fiscal month of April amounted to $102,002.89.

Syndicate.—The south drift has, for the past 25 ft, shown an improvement in the shape of a vein about eight inches wide, accompanied with a flow of water amounting to about four inches. The assays from this vein are very flattering. The work of sinking on the Osceola vein from the old tunnel continues, as well as raising from the new tunnel to connect with the winze. About 100 ft more will have to be made before the connection is completed. Are breasting with one sidft on the Osceola ledge, the ore being put in the chutes preparatory to taking out through the lower tunnel when the connection is completed. The ore is turning out satisfactorily as to quality. The mill is running steadily on custom ore.

Con. Pacific.—The winze on ledge No. 1, where tapped by crosscut from bottom of winze No. 2, is down six ft. The ledge is widened from 20 inches in thickness to nearly 30 inches, and has more of an eastern dip. The ore is of a good milling grade, is decomposed and separates easily from tho walls, which are well defined. The main shaft is down over 230 ft. A ledge of considerable strength, and assaying gold, has come into the shaft with an eastern dip. Tho ground has generally hardened and work is slower. It is expected to crosscut at 250 ft, which depth will be attained by tbe 25th inst.

Blackhawk.—The west crosscut, on the 220 level, is in 94 ft. The face of the crosscut shows a favorable change. The winze on tho same level is down 42 ft. The vein in the bottom of the winze is fully as wide as where started—about four ft—and of the same character of ore. The east crosscut, 320 level, is in 38 ft, showing frequent seams of quartz. On tho samo level, drifts are being run north and south on the first vein cut in the west crosscut. The south drift is in 31 ft, and the north 28 ft. An improvement is shown in both directions upon tho point where first cut.

Bodie.—The east crosscut from tho old shaft is in a total distance of 266 ft. The east crosscut, second level, is in 145 ft; the west crosscut, second level, 79 ft. On the same level a crosscut has been started east from the Gildea, which has been run 12 ft. The west crosscut, third level, is in 35 ft. The drift nortb on the vein, same level, is in 124 ft. The mill is running steadily on Bulwer ore. Arrangements have been made for increasing the capacity of the mill by adding two pans and a settler.

NEVADA.

Derbec Mine.—*Transcript*, May 18: Everything is running smoothly at the Derbec mino, the employees having resumed their places at the old wages, viz., $3 per day. The recent reduction to $2.50, which caused all of the miners to quit work, was the result of a misapprehension on the part of the Superintendent. It is reported that it was far from the intention of the board to reduce the wages of skilled labor, and that upon learning such an effort was being made, they immediately took steps to prevent it.

Pleasant Valley Notes.—The gravel mines in Pleasant valley are beginning to make their final clean-up, the supply of water being nearly exhausted. At the Badger Flat claim four men have been busily at work since December last, and they are now cleaning up for tho first time, with good prospects. Hamilton & Co. are prospecting on Beckman hill, near Novey's ranch. There are four or fivo men working, and they are now in gravel and hard cement. The owners of the property appear to be satisfied with the outlook.

Ditch Improvements.—The Excelsior ditch company contemplates making some important improvements along the line of their property at an early date. The head of the ditch is at the moutb of Rock creek, two and a half miles above Hoyt's old crossing. At the mouth of Rush creek some heavy masonry work will have to be done, and all along the line to Smartsville the ditches and flumes will be re-constructed to a great extent.

Jottings.—*Foothill Tidings*, May 17: In the Scadden Flat mine the ledge is strong, being from 18 inches to 2 ft in width. Recently there has been some very rich rock taken out by tributers. There are between 50 and 00 men working about the mine. The new shaft of the Rocky Bar is 120 ft perpendicular, and is extended 70 ft below that on the incline. The ledge is not large but of excellent quality, paying $35 per load. In the Centennial the ledgo is showing an average width of six inches—a good size for this mine. The rock taken from this mine has been almost uniformly rich, and from a clean-up of 43 loads, at Smitb's Orleans mill, $4,800 was obtained, without including the sulphurets, which will go several hundreds more. Washington is timbering the new shaft, and building a new 40-ft water wheel to run the pump. Regular mining work to be resumed when those improvements are finished. The Hathaway gravel claim, situated on Scotchman's creek, near Washington, is prospering. They have about 4,000 inches of water, with a fall of 350 ft. Eight white men are regularly employed, and 30 Chinamen are working by contract. At King's Hill, work is progressing as usual, and the mine reported looking well. No recent clean-up has been made. The last crushing was a very profitahle one to the lessees. The ledge has lately opened up splendidly on the south drift of the 250 level. Of late the ledge in the New York Hill has increased in size, more men have been put to work, and everything is said to look quite favorable. Work on the Cold Spring gravel mine, northeast of Nevada City, progresses as usual. The tunnel is being pushed ahead energetically. The shaft of the Knight of Malta mine is to be sunk 100 ft deeper, or nearly 200 ft in all. Tho work was commenced a week ago, and good progress is being made.

PLACER.

Gold Run Items.—*Argus*, May 17: The miners at this placo are all busily at work, with a very fair prospect of at least an averaging good yield. The Big Bonanza has had two clean-ups, and it is reported that the company will be able to net $16,000 per month. The Towle Bros., J. L. Gould and Col. J. F. Moody are the principal owners. Twenty-five to 30 men are employed day and night, and about $1,500 inches of water used. The Cedar claim, adjoining the Big Bonanza, has had three clean-ups, with satisfactory results. The amount is not named. About 15 men aro constantly employed day and night.

Dutch Flat.—The Glen mine, owned by Andrew Larson, is one of tho best in the county, and has been thoroughly prospected by Mr. Larson, who is at present pushing forward the work on his tunnel, which be has already run about 600 ft; he has also a good track laid and an easy grade. After running about 50 ft more Mr. Larson expects to strike rich paying gravel.

PLUMAS.

Hungarian Gulch.—*National*, May 10: Some time last fall a company consisting of Messrs. Houck, Sterrit, Brown & Oansner, commenced sinking a shaft in the mouth of Hungarian ravine. They have got the shaft to bedrock, at a depth of 42 ft, and have drifted from it about 15 ft. Three or four days ago they struck a "lead," and from a bucket of gravel took out $15 in coarse gold. They are well fitted up to work, a 10-ft overshot wheel doing the pumping, and will soon be rigged to hoist the dirt. The old gulch was worked up from a point about 500 ft below tho preseut shaft, and paid enormously.

Plumas National.—This mine is showing up well, and has every indication to prove it a permanent and valuable property. The workmen in the lower tunnel reached the ledge about a week ago, after running 840 ft, the vein matter coming in strong and showing a ledge averaging four and a half ft in width, prospecting richly in free gold, and showing a superior quality of quartz. The ore is free milling, and the sulphurets carry considerable gold, and are readily worked by the ordinary mill process. The distance from lower level to No 1 tunnel, with the incline, is over 300 ft. A shaft was commenced in the tunnel before the ledge was reached below, and has made considerable progress, following the wall down, and showing the ore body continuous and coming in strong and well defined, the ledge in places showing a width of five and six ft. This mine has one of the longest bodies of pay ore of any mine in the county, being over 400 ft in length, and at least six years' run of oro will be shown by these developments. The mill, of 30 stamps, is one of the finest in the State, having all the modern improvements.

Gold Stripe Mine.—The Gold Stripe is another of the prominent mining industries of this section. Though having been worked only about two years and a half, this mine has produced a large amount of bullion, and has also made very extensive improvements. It is worked by three tunnels, the lowest being on a level with the mill, with which it is connected by a fine and substantial tramway. The lower tunnel has been run about 1,800 ft, where it struck the ledge. The present work is being conducted to breast out sufficiently to start a series of stopes that will soon be able to supply the mill with ore. The mine has also a large resource of ore in the upper works.

Green Mountain.—This is another of the large working mines of this section, and is promising well. It has produced over $500,000 since it was first opened. The facilities for working and cheapness of production are unsurpassed by any mine in this State. A fine 32-stamp mill is connected with tunnel No. 3, and is run by water power. The water is brought from the immense reservoir in Round valley, through eight miles of ditch.

SIERRA.

Rainbow.—Downieville *Messenger*, May 10: The old Rainbow quartz ledge, at Chips' Flat, is to be opened and prospected by men of ample means and good business capacity. Last December, Wm. A. Hanley, an old resident of Alleghany, organized and incorporated a company, which is now proceeding in a systematic manner to re-open this once famous deposit, which once, within the space of 50 by 200 ft, yielded nearly $300,000, in gold. No work has been done on the property since 1864, for the reason that the persons owning it were not financially able to put on the necessary machinery to keep the works clear from water. During the intervening time, however, the hill has been drained by lower tunnels, and although the owners expect to encounter considerable water, the task of handling it will not be so difficult as it would have been 15 years ago. The following gentlemen aro officers of the company: Trustees, S. C. Farnum, (President) N. C. Walton, (Secretary) J. O. Groves, W. A. Roberts and W. A. Hanley.

Excitement.—There is great excitement in Sierra City and vicinity over the recent rich gravel discovery in the ridge southeast of that place. From one wheelbarrow load of gravel $8 was obtained. The whole country has been located, if reports be true. An immensely rich gravel deposit underlies this ridge for many miles.

TUOLUMNE.

Riverside Mine.—*Independent*, May 17: This mine is looking up, as some now and encouraging features have very recently been developed, which is expected, from the present outlook, will provide as much ore above the old levels as has been extracted heretofore. A parallel vein has been discovered a few ft from the one which is being worked at the present time, and which has proved a good milling vein. In the event that the newly discovered vein is of as high-grade ore, it will place tbe Riverside mine in the front rank of quartz mines in tho county, considering the facilities the company have at command for working high-grade ores. The work of running the lower level, to strike tho old vein at the greatest draining depth, is being rapidly pushed forward with the aid of the Burleigh drills.

Miscellaneous.—The Mount Jefferson company are still digging away, but have not struck anything yet. There is a new mining enterprise started, which far more than makes up for any failure on the part of the former. The mine is located in Dick Barnes' field, in the lower part of the town of Groveland, about 50 yards from the main street, and is at present owned by three enterprising young men from San Francisco. They have recently crushed about 12 tons of tho first rock taken out, in the Mount Jefferson mill, and it turned out far above their expectations; yet they have since struck it richer than ever. They have worked it, so far, about four or five ft in width, but have no wall on either side. Surface indications show the ledge to be about 18 ft in width.

NEVADA.

WASHOE DISTRICT.

Sierra Nevada.—Gold Hill *News*, May 21: The bottom of the incline was yesterday within 10 ft of the top of the 2400 level. The bottom is in a very fine formation of quartz, containing streaks of rich ore. Its dip is not so perpendicular as that of the ore body, and consequently it has been carried to the east of the ledge proper. On the 2200 level the stopes have been opened out from the north crosscut, under the incline, to the south crosscut, a distance of 68 ft, and 12 ft wide. The new ore house is not quite ready for use.

Union Con.—The main south drift, 2300 level (2200 level of the Sierra Nevada), is in 148 ft, and is encountering a fine vein formation, containing promising stringers of quartz. It is being run entirely outside the vein. The main north drift, 2000 level, continues in hard, blasting porphyry, and has its face 300 ft from the south line.

Belcher.—The main incline has reached a sufficient depth below the 2700 level for a chute for the station, and it is being put in. The soutb drift, 2500 level, is now 447 ft in length, and is heing pushed along the west side of the vein. The new crosscut on this level, 300 ft south of the incline, has not yot reached the ledge.

Con. Imperial.—The joint Alpha winze is now down 250 ft on the slope below the 2400 level. To the length of the north drift, 2600 level, 40 ft per week are being added, through quartz and porphyry; total length, 278 ft.

Ophir.—The incline is 60 ft, on the slopo, below the 2300 station, and is to be continued on down to the 2400 level. It is still in a very fine and promising formation of low-grade quartz, which gives indications of making into something better when prospected further. On the 2000 level the south sill floor has followed the vein till it has widened from one and one-half ft to over five ft of good milling ore.

California.—The stopes yielded tho past week an average of 157 tons per day, which has now been increased. Thirty ft per week are being added to the length of the joint Con. Virginia west drift, 850 level, and its face is now 185 ft from tho shaft, in hard porphyry.

Gould & Curry.—Thirty ft per week are being added to the length of the joint east crosscut, 1700 level, and its face is now 914 ft from the lateral drift in hard, blasting ground. The work of cleaning out and retimbering the south lateral drift, 1700 level, to connect with the Savage winze has been receiving required attention.

North Bonanza and Flowery.—One crosscut is on the 200 level and at a point 200 ft north of the sbaft. Another will be started on the same level, 575 ft further north. The third will be on tho 300 level.

Justice.—Streaks and bunches of ore continue to be found in tho crosscut 1150 level, the drift 1300 level along the west wall of the vein, the lateral drift between crosscut five and six same level, and in crosscut No. 1, 1550 level.

Alta.—The station, 1750 level, of the joint winze has been completed, and drifts started botb north and south as bases for crosscuts.

North Con. Virginia.—Tbe shaft is to be adapted to the use of skeets, which will contain about three tons of rock each, and as soon as this work is completed, sinking will receive a new impetus.

Best & Belcher.—The joint east crosscut, 1700 level, is being driven toward the perpendicular of the new joint east shaft at the rate of 30 ft per week; total length from the lateral drift, 914 ft, its face in porphyry.

Continued on page 340.

Practical Divisibility of the Electric Light.—No. 2.

A paper, by E. J. Molera and J. C. Cebrian, read before the California Academy of Sciences, April 21st, 1879.

Comparison with Gas Lighting.

Comparing now our system with gas lightiug, we must observe that its use will pressnt no difficulties to the consumer; the motions of the prisms and the secondary lenses will be as easy as ths turning of a gas-key; no matches will he needed; no fear that a hurner was carelessly left open; and no machinery required for that purpose ahout any building. Our system must certainly have all the advantages of tbe electric light upon gaslight, already granted and mentioned before. The only one in dispute was ahout the cost, which our system lowers to an unprecedented degree.

To prove that it is so, we will examine: 1st. The outlay needed to put up a system of lighting; 2d. The running expenses of the enterprise; and 3d; The waste or loss of the system.

1st.—Capital Needed.

The pipes used in our system are uot subject to any especial pressure, may he of any material, and need no gas-tight joints; therefore their cost when laid must he smaller than that of gas pipes. The price of the prisms or reflectors will certainly cost less than the lahor of making tight joints.

As for the works or machinery to produce electric light, their cost is excsedingly below that required for gas works, where very large spaces are uecded, and costly, huge buildings and machinery required.

One important item is the outlay made by the consumers in order to receive the light in their huildings. Instead of the costly net of gas pipes made gas tight, our system requires simply wooden or tin hoxes; instead of the expensive gas hurners, brackets, chandcliers, etc., we ueed only a set of prisms and lens, of a low price, that will never wear out, and nsver need repairs on account of leakage.* The advantages of our system in this respect are self-evident.

2d.—Running Expenses.

As for the running expeuses, we will remark that the capacity of the largest dynamo-electric machines in operation has attained the rate of 6,000 candles per horse power spent. It has also heen noticed in the different patterns of dynamo-electric machines made, that when the light-giving power increases three times or over, the horse power required only increases twice. It is therefore likely that a machine of a 100-horse power will have a capacity of over 15,000 caudles per horse power. Such and still more advantageous machines will be used in our system.

When electric light is produced at the rate of 6,000 candles per horse power, its mere production costs ahout one-twentieth the cost of gas light. When produced at a rate twice as large, its cost must he less than one-fortieth the cost of gas; because the increase in the production of eleotric light does not requirs a proportional increass in lahor or wages. The same numher of attendants will take care of an electric lamp and a chamher of light giving forth 1,000,000 or 2,000,000 candles; and a 200-horse power steam engins does not require twice the numher of attendants than an engine of 100-horse power. Whereas, in gas making, as the gas produced is proportional to ths uumher of retorts in operation, an increase in the production of gas must require a proportional increase in labor or wages.

3d.—Waste.

The wastes of gas making are many, but we will only mention those occurring from the gas holder to the gas hurners. The waste or leakages through the street pipes has heen computed at from 5% to 20%—we will put it at only 10%. The leakages occurring in the gas pipes and fixtures of huildings are from 20% to 40%—let us estimate them at only 20%. The waste on account of defective gas hurners is the most import—it reaches sometimes to 86% of the gas consumed; in Loudon, where great care is exercised in that respect, it has beeu computed hy gas engineers that fully 25% is lost on that account—we will put the average at only 40%. The total of these wastes amounts to over 56% of the gas manufactured. Whereas in our system ths wastes are only 8% for each reflection, and the total can nsver sxceed in practice 50% —less than thoss of gas distrihution.

The facts therefore ahout our system are:

1st. The outlay of consumers for lighting fixtures is smaller for our system than for the gas system.

2d. The capital invested for lighting works in our system is smaller than that required for gas works.

3d. The production of electric light hy our system will he a very small fraction of the cost of producing gaslight.

4th. The loss or waste of distributing light by our system will he smaller than that occurring in the distrihution of gas.

The legitimate consequence, therefore, is that our optical system affords the means of producing and distrihuting electric light in a city, at a mere fraction of the actual price of gaslight.

In conclusion, it will be readily seen that our system can he adapted to all purposes of lighting. It may as well furnish slectric light to a *whole city* from an original station, as to a *single building*, or set of huildings.

It can be extended in a most fitting manuer to the lighting of *mines*, without fear of explosions, without increasing the temperature or contaminating the air; and the light can always he easily shifted to the precise place where ths work is heing done.

In *ships* the use of our system will he invaluable, as it allows not only to have powerful mast lights, hut on account of the minute distrihution of light, every dspartment in the ship may he lighted, without fear of conflagration.

For all kinds of industries and commercial places, where danger of fire is to he apprehended, such as *warehouses, storerooms, powder works* and *magazines, chemical factories*, and the like, our system is *the only* one that can hs used, as it allows to have all the light needed, without the possibility of starting any fire.

Our system will also allow to use light in places where formerly it was unthought of, as for instance, in *railroad tunnels*.

Finally, for all large institutions, like colleges, libraries, hospitals and asylums, factories, barracks, prisons and other puhlic estahlishments, our system, besides totally preventing fires, has the grsat advantage that ths light can never he meddled with hy the inmates of the institution, hut it is under the direct control of only one supsrvising officer.

[A paper by E. J. Molera and J. C. Cebrian, read before the California Academy of Sciences, May 5th, 1879.]

In the following paper will be found some additional data in support of the statements made in our previous communication upon our new system for the practical divisihility of the electric light.

I. Number of Candles Obtained per Horse-Power.

Mr. H. Fontains, a well-known scientist, and a recognized authority in matters pertaining to electricity, declared previous to 1878 that he has several times ohtained electric light at the rate of 1,900 candles per horss power.*

Mr. Tresca, of the French Institute, rsported to the Paris Academy of Sciences his expsriments made in 1875, when a Gramme machine of ahout 18,000-candls power rendered 241 carcel burners (2,270 candles) per horse power.*

In ths experiments mads in 1876-77 at the South Foreland lighthouse by Prof. Tyndall and hy Mr. J. N. Douglass, the Secrstary Engineer of the Trinity House Board, they ohtained 1,291 candles per horse power. † In 1877 said Mr. Douglass saw at Paris a small Gramme machine giving 3,000 caudles psr horse power, and he adds that the factory had just sold a larger one giving 3,839 candles per horse power.‡

In August, 1877, Mr. J. N. Shoolbred, member Institute C. E., stated at a lecture that the Gramme machines could give 3,000 candles per horss power.§

In the *Scientific American Supplement* of March 9th, 1878, it is said that the electric light was tried in Paris at the *Palais de l'Industrie*, where a space of 12,000 square meters was illuminated hy two electric lustsrs of six lamps each; that two steam engines of 25-horse power each were used, and the light was equivalent to ahout 300,000 candles, which gives about 6,000 candles per horse power.

We will now remark the fact, that ths larger the amount of electricity produced by a dynamo-electric machine, ths larger is its light-giving capacity per horse powsr spent. This is in accordance with that electrical law msntioned in our previous communication, and quoted among others hy Wm H. Preecs, of London, ‖ and by Prof. John Ls Conte, of California.** The law is: that when an electrical current is divided into suh-currents, the light-giving power of each suh-current is less than inversely proportional to the square of the numhcr of currents. It is then natural that when several currents are added together, ths result will he larger than the sum of the separate currsnts, as was practically shown hy the experiment made hy Prof. Tyndall at ths South Foreland lighthouse.††

He had two small Siemens machines of a power of 4,446 candles the one and of 6,563 the other, making in all 11,009 candles; yet, whsn they were coupled so as to feed one single lamp, the light produced was 13,179 candles, or 19.7% over the former figure, with the same expenditure of power; or else, they could have produced the same amount of light with less expenditure of horse power.

It has also heen found that whenever tbe power spent in a machine is increased, the light produced increasss in a grsater proportion than the power. And finally, if instead of adding or coupling together two separats currents, we produce a single current in a single machine with a power equal to the sum of the powers spent in the two former currents, ths result is still greater than 20% over the sum of said two currents, as will he seen in tbe following table:

Name of Machine.	Maximum capacity in Candles.	No. of Caudles Fed.	Horse Power Required.	No. of candles per Horse power.
Oramme..	4,000	1	2	2,000
	6,000	1	2½	2,400
	15,000	1	5	3,000
	25,000	1	8	3,125
	36,000	1	10	3,600
	50,000	1	13	3,846
Brush.....	4,000	1 or 2	3½	1,143
	12,000	4, or 5, or 6	6½	1,846
	35,000	10 to 18	13	2,691

The smaller duty, or production per horse power, of the Brush machines, is because they are mads to feed several lamps, whereas the Gramme machines feed one single lamp; so that the Brush machines may he considered as a combination of two or more machines of ahout 2,000 candles each, huilt so as to combins together two or more of them in one; thus, the 12,000 candle machine acts as a combination of six machines of 2,000 candles or less each, which may work independently or in combination of two in one. The difference lays in this: that six separate 2,000 candle machines would require a power of 12 horses, and hy their combination in one nachine, the required power is reduced to 6½ horses. All of which corrohorates the ahove stated fact, and clearly proves that if, at present, the duty of dynamo-electric machines is from 2,000 to 6,000 candles per horse power, with expenditurss varying from 2 to 25 horse power, when we have a machine huilt so as to he run hy 100 or 500 horse power, its duty will certainly increase in a large proportion.

Such machines have not been built, because there has heen no demand for them. A powerful focus of light has no practical application hut for lighthouse purposes; and even in that case, the intensity is limitsd; first, on account of the geographical range, further than which no light can hs seen; and second, because in thick weather a large increase in intensity does not incrsase the optical range but in very few feet. In fact, the only serious objection made to electric light, has heen its too great inteusity, as heing inadequate to the general purposes of lighting. For instance, four lamps of 2,000 candles each, making in all 8,000 candles, and heing properly distributed, will give for a large space a more efficient illumination than a single lamp of 12,000 candles. Thus, a check has been put to the makers of dynamo-electric machines; and the extent of the practical capahilities of such machines has remained necessarily unknown. But as soon as the economical divisibility of the electric light be proved as a fact, larger machines will he built which will take advantage of the ahove-mentioued fact or law, and will causs the further cheapening of the electric light.

Another fact that proves the correctness of the ahove theory, which we havs seen coincides so well with the practical results and experiments of the above-mentioned scientists, is the following results, obtained by Prof. J. W. Drapsr, of New York, who in his researches ou radiant heat found that the light of ignited platinum at 2,590° was more than 36 times as brilliant as when the temperature was only 1,900°.*

Now the tempsrature produced by mechanical means is directly proportional to the work, yet the light corresponding to the increase of work or heat is a very rapidly progressing proportion.

II.—Cost of Electric Light.

Mr. R. Briggs, C. E., of Philadelphia, has calculated tlie theoretical relation of the values of gaslight and electric light, taking as hasis the very low figure of the expsriments of the Franklin Institute; and computing the heat-unity ahsorhed hy a standard candle produced hy coal gas and hy electricity, he finds:

$$\frac{\text{Heat units consumed by gaslight}}{\text{Heat units consumed by electric light}} = \frac{100}{1},$$

But considering that in those experiments only one-third of the horse power was spent in the light, and the other two-thirds wsre necessarily lost, the ahove relation is reduced to 34÷1.† We must remark, however, that the Franklin Institute experiments, showing 380 candles per horse powsr, must have heen made with inferior kinds of dynamo-electric machines, as other competent experts of different countries find a duty per horss power over five times greater; in which case the above relations would be more favorahle still to the electric light; and even President H. Morton, who is not an advocate of the electric light, stated in 1878, that ths Brush and other machines, render light up to 1,200 candles per horse power.§

Similarly to Mr. Briggs's method, we may find the practical relation hetween the costs of the two lights, as follows: One cuhic foot of gas comes from one-quater pound of coal; one pound of coal is equivalent to 15,000 heat units; Therefors 15,000÷4=3,725 heat units correspond to 1 cuhic foot gas; now the merchantable residues of gas making amount in Bristol to less than 30% of the cost of coal;‡ and in America to much less than in Bristol;‖ allowing then 30%, we must suhtract from the 3,725 units 30÷100×3,725=1,117, leaving thus 3,609 heat units corresponding to 1 cuhic foot of gas, which equals 3 standard candles; hence a standard candle represents 3,608÷3=1,203 heat units sxpendsd.

Now, for electricity, we know that a horse power consumes from 2 to 6 pounds of coal per hour; taking the 6 pounds, 1-horse power will be equivalent to 90,000 heat units per hour; if ws call N the numher of candles produced hy 1-horse power, $90{,}000 \div N$ will represent the numher of heat units per candle power spent by slectricity; the relation then stands:

$$\frac{\text{Heat consumed by gas}}{\text{Heat consumed by electricity}} = \frac{1{,}203}{\frac{90{,}000}{N}} = R\text{; therefore}$$

When N=500 candles, then $R = \frac{6.6}{1}$

" N=1,000 " " $R = \frac{13.2}{1}$

" N=2,000 " " $R = \frac{26.7}{1}$

" N=3,000 " " $R = \frac{40}{1}$

And so ou. Thess relations are not exaggerated because we have to add to the cost of the fuel the cost of carhon points.

This is why Dr. Siemens, of London, said that one pound of coal thrown into the engine that drives an electric machine, will give 15 times more light thau if thrown into a gas retort to make coal gas.*

This also proves the assertion of Mr. H. Fontaine, mentioned above, who, after several years of constant experiments, and careful attention to this suhject, has come to the conclusion, since 1877, that whenever the electric light is produced in quantities of 300 candles or more, it is cheapsr than gaslight, and when produced in amounts of 7,500 candles and over, even if three-fourths of said amounts are wasted, ths electric light is much cheaper than gaslight.

For practical instances of the cheapness of ths electric light ws will remind you of the trial made as early as in 1873–74 at the tower of the Houses of Parliament, London, where an old pattern of the Gramme machine was used: the light was of 7,000 candles; its actual cost one-eighth the price of London gas.†

Later, the comparison hetween the two lights mads hy the engineers of the Trinity House Board was, that when the intensity of gaslight was two-thirds of that of the electric light, the cost of gas was one-third ahovs that of electricity.‡

Again, the use of the Jablochkoff system at the Hotel and Magasins du Louvrs in Paris for over 18 months, since 1877, shows that they are spending for light two-thirds of what they used to pay for gas hills, and they get nearly three times as much light as before.§ We will remark that the Jahlochkoff's is not the cheapest electrical system.

Then, we have the instance of ths Alhert hall, London, last February, where the actual cost of the electric light was one-third the amount of the gas bill, at London prices; and which, at the San Francisco prices, would have heen less than ons-sixth the cost of gas.‖

Then, we have the statement of Mr. Geo. Deacon, the engineer of the town council of Liverpool, who was sent to Paris during the summer of 1878, for the especial purpose of studying the lighting question. In his able and full report, hs advises the town council not to adopt yet ths electric light, on account of the difficulty of managing it. But he admits, as far as the cost of production goes, that wheu produced at the rate of 15,000 candles, the cost of electric light has been as low as one-fifth the cost of gaslight.**

Theu Mr. J. H. Schoolhred, alrcady mentioned, hrought to notice, last December, several instances of actual practice, where the cost of electric light is a fraction of that of gaslight.††

Finally, Mr. J. N. Douglass, also msntioned ahove, at a lecture delivered last March, stated the conclusions arrived at, after the extensivs and exhaustive experiments carried on at different times hy the Trinity House Corporation. He said that for an intensity of light of 5,000 candles and upwards, electric light is cheaper than gaslight; that for said intensity of 5,000 candles, the cost of electric light is less than half the cost of gaslight; and that electric light decreases in cost per unit in ratio of its augmented power, no further addition to the working staff and hut little extra expenditure for huildings and plant being necessary for an intensity of 40,000 candles.‡‡

To present any more practical instances would he tiresome for you.

Hers we have the definite statements of several experts, all well qualified in every respect for this question; they take different series of experiments, made at diffcrent localities, as hasis for their assertions; and they all come to the conclusion that in amounts not larger than 15,000 candles, electric light costs from ons-fifth to one-eighth of the cost of gaslight. And one of the experts declares that practice corroborates the fact that for larger intensities the cost per unit of electric light decreases in ratio of its augmented power.

Therefore it is quite natural tbat when the electric light be produced, not in amounts of 15,000 candles, hut in amounts of 1,000,000 or 2,000,000 candles, its cost will not he more than one-twentieth that of gas, as we had stated.

III.—Losses or Waste of our Optical System.

These are due to the reflections and refractions of light; and to the absorhtion of the

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*As an interesting fact we will notice that there are in San Francisco about 13,000 buildings supplied with gas; the average cost of their gas pipes and gas fixtures is at a low estimate $1,000 per building; making in all $13,000,000, which is more than twice the capital needed to build new gas works to supply the whole city. The repairs of those fixtures, the taxes and the interest of that money represent over $3,000,000 yearly; whereas the total amount of the yearly gas bills paid to the San Francisco Gas Co. is only $1,500,000. Therefore the community in San Francisco pays on account of the gas fixtures nearly 140% of what it pays for gas bills. That makes the price of gas over $7 per thousand instead of $3.

*H. Foutaine, "*Eclairage a L'Electricite*," Paris, 1877.
† *Engineering*, Oct. 19th, 1877.
‡ *Engineering*, Nov. 2d, 1877.
§ *Engineering*, Nov. 1st, 1878.
‖ *Engineering*, Jan. 24th, 1879.
** Scientific Press Supplement, No. 3.
†† *Engineering*, Oct. 26th, 1877.

* J. W. Draper's Scientific Memoirs, p. 41, N. Y., 1878.
† *Engineering*, October 18th, 1878.
§ Address before the American Oaslight Association.
‖ *Engineering*, December 27th, 1878.
‖S. F. Gas Co. Reports.

*Siemens Annual Address, *Engineering*, Feb. 8th, 1878.
† *Engineering*, December 20th, 1878.
‡ *Engineering*, December 20th, 1878.
§ *Engineering*, December 27th, 1878.
‖ *Engineering*, February 28th, 1879.
** *Engineering*, February 21st, 1879.
†† *Engineering*, December 6th, 1878.
‡‡ *Engineering*, March 28th, 1870.

atmosphsre on account nf the distance traveled by the light.

Thers will be net more than six reflections or changes nf direction of light needed to put our system in practice.

In the streets we can always go from a crossing to any placn in a city, having rectangular blocks, witb one change of direction. Only in the case of going into an alley in the middle of a block, there will bs needed two changes. Considering thnt such cases are comparatively fsw, and thnt the streets where the mnin beams of light are hnve no change of direction, we may say that one chauge of direction nr one reflection is needed to supply streets with ligbt.

For buildings we need one change of direction from the strect main to the service pipe; a second change from the service pipe into a vertical supply pipe; a third change from the latter into the different horizontal supply pipes for every floor: the rooms that are not in the liue of the horizoutal supply pipe need a fourth change from it into a lateral branch; thsn we nced at every room a fifth change of direction to go from tho last pipe into the room. That makes five changes of direction or live reflections, at most, needed to supply a building with light.

The street lamps will need from two to four reflections, according to location. The sum nf all these reflections gives an average of less than six, as said before.

Then our light has to pase through the primnry lenses or chamber of light, nnd through the secondary lenses. Everytime that light passes througb one lens, it losses about 6% of its intensity, according to the mean of Sir J. Herschel's and Lambert's experiments.*

And according to Sir Herschel† nnd Dr. Lommel‡ the loss of light by reflection is:

After reflection on polished glass	about	96%
" " " mercury	"	40%
" " " polished speculum metal	"	34%
" " " " silver	"	9%
" " through a totally refracting prism	"	8%

Therefore tbe loeses of our system will be: First, a loss of 6%, then six succesive loseces of 8% each; then another loss of 6%.

If we call L the intensity of the original light, and L^1 that of the distributed light, the formula to find L^1 will be this:

$$L^1 = \frac{L \times (94)^2 \times (92)^6}{(100)^8} = 53.57\ L;$$

tbe loss, then, amounts to 46.43%.

Ae for the loss due to absorbtion in the travel of light along the tubes, we find that according to accurate experiments made by Mr. Bouger,§ a well-known French scientist, light loses 2.7% in intensity after passing throngh a stratum of pure atmosphere one kilometer in thickness. Then, Maj. P. C. Hains‖, the Engineer Secretary of the L. H. Board, U. S. A., eaye that according to experiments made all along the Atlantic coast, the transpareney of the atmosphere is such that, during six montbe in the year, light will lose only 9.7% in traversing said distance of one kilometer; that in eome cases the transparency is euch as to cause a loss of only 3.4%, although in some cases the lose amounts to 25%.

Now, considering that the pipes enclosing the light are not subject to the atmospheric changes of weather, that occur along the shore line where said experiments were carried, we may safely assume that, in our case, we will not lose more than 10% for that distance: 1 kilometer =3,281 feet; calculating the losses for various distances, we find:

Loss at 400 ft. distance	012
Loss at 800 ft. distance	023
Loss at 1600 ft. distance	047
Loss at 3200 ft. distance	097

In a city the central stations of light, wberefrom to distribute it, need not be more than 6,400 feet apart. With such distances in San Francisco, four stations would be enough to supply all that part of the city inside of the charter line of 1851. In euch a case, the loss for the most distant point will be 9.7%; but the average lose will be that corresponding to a distance of 1,600 feet, which is 4.7%. That loss, on our last amount of light of 53.57L, gives an additional loss of 2.52, which, added to our former loss of 46.43, makes a total loss of 48.95%, or less than 50%. And the formula to find the final amount of light, l, received by the consumers will be:

$$l = \frac{L^1 \times 95.3}{100} = \frac{L \times 94^2 \times 92^6 \times 95.3}{(100)^9} = 51.05L.$$

IV.—Other Economical Advantagee of our Syetem.

But besides these losses, our system can easily take advantage of an additional source of light, because, as Mr. J. Jamin, of the Paris Academy of Sciences, stated laet year,** tbe quinine sulphate has the property of changing the blue, violet, and ultra-violet rays into white light, and, at the same time, it renders visible and useful, radiations wbich the eye could not perceive, thus adding considerably to the hrilliancy or intensity of the light. Uranium glass, and many otber substances, act in tbe same manner, and present tbe means of suppressing the rays wbich are objectionable in the electric light.

In order to take advantage of this property, we bave only to surround any eleotric light by some of thess substances. But in the methods of electric lighting heretofore proposed, where a great number of electric lamps are used, such a process would bs extremely expensive, inconvenient, nnd linble to get nut of order. Whereas our proposed method of distributing light reuders that operation as simple and low-priced as possible; because we need to surround only *one* chamber of light with the required substance, and nll the smaller lights fed by it, whether in hundreds nr in thousauds, will be affected accordingly. Cousequently the loss of 49%, hereinbefore mentioned, may, on account of this circumstance, be grently reduced, with almost no expense.

Another of the great ecenomical advantages of our new system of divisibility of the electric light upon any other is on account of the conducter connecting the generntor nf electricity with the lnmp or lamps.

As we have snid, the expense for electric conductors in a city will be enormous; but tbey have still another advantago, as being a great source of lose of electricity. Mr. J. N. Douglass, in the experimeuts above mentioned, fonnd that when the current of electricity traveled a distance of about 1,300 feet, before reaching the lamp, the intensity of light suffered a loss from 58% to 80%; and for a distance of 600 feet, from 27% to 37%. Then Messrs. Siemens, the engineers of London, furnished a larger cable, as conductor. It was well insulated and especially adapted for their dynamo-electric machines; and even then the lose of light in a distance of 1,400 feet varied from 23% to 35%.*

As in our system of distrihution of light, the dynamo-electric machine may always be placed a few feet only from the elèctric lamp, it is evident that our system is the only one which can avoid both the high expense of cables and conductors, and the losses they produce.

In conclusion, we will compare the practical distribution of a light produced by a 25 borse-power engine, or 15,000 candle light, which is not the most advantageous case we might take, and we will see what amount of light we will obtain by the different proposed methods.

In the Jablochkoff method we will obtain 25 burners of less than 940 candles each, or less than 23,500 candles in the aggregate, provided it is possible to build a machine of 25 horse power, feeding 25 lamps; heretofore only 16 or 20 lnmps have been fed.

In the Edison system, according to the most recent reports, with 2½ horse-power engine, 14 lamps are obtained of from 18 to 20 candle power each. If we take a 25 horse-power machine we will obtain 10 timee as much electricity, but then the number of lamps increasing to 140 for instance, the loss will increase in a larger proportion; therefore we will take 10 machines of 2½ horse power each, and will obtain 140 lamps of 20 candles each.

In the Brush system we will obtain 36 lamps, giving 70,000 candles in all.

Iu the Werdermann system, 2 horse power gives 10 lamps of 40 candles each; taking 13 such machines we would obtain 130 lamps of 40 candles.

In our system we will obtain 82,500 candles, which can be divided into 8,250 lights of 10 candles each, or 4,124 lights of 20 candles each. Now we have:

NAME.	No. of Lights.	Total Candle Power.	ADAPTATION.
Jablochkoff	25	23,500	Large spaces.
Werdermann	130	5,200	Small spaces.
Brush	36	70,000	Large spaces.
Edison	140	2,800	Small spaces.
Molera & Cebrian.	82,500	82,500	Large and small spaces.

Or taking the horse power per unit:

NAME.	Number of Lights.	Candle Power.
Jablochkoff	1	940
Werdermann	5.2	200
Brush	1.44	2,800
Edison	5.6	300
Molera & Cebrian	3,300	8,700

Engineering, October 26th, 1877.

[Concluded.]

A Singular and Valuable Curiosity.—A specimen of the handiwork of tbe ancient Spanish miners inhabiting this Territory was bronght to town from the Cerrillos mines, a day or two since, and is now on exhibition at the office of Gen. Atkinson. It is a casting from what seems to be pure silver, and is, taking a front view, in the shape of a crown. At the base it is 2½ inches thick, at the top 2 inches, and at the sides 1½ inches. Its greatest width is 6½ inches, and from the top to the bottom 6 inches. Its weight is 9 pounds and 14 ounces. If pure silver, its intrinsic value is about $150, but there is supposed to be some gold in it, which, of course, would add to its value. This remarkable ingot was discovered under a boulder, about half a mile to the southeast of tbe celebrated Turquise mine, in tbe midst of tbe new discoveries. It must have lain there at the leust since 1680, as uo working in tbese mines was done by tbe Spaniards after the uprising of the Indians during that year. It is well known that royalties were required of the miners by the old kings of Spain, and tbis may have been cast to be used in payment of his demand; but on account of its peculiar form it is more likely that it was intended as a present to the king. Wbatever may be tbe true solution of the question, it certainly is one of the most interestiug curiosities ever found in this region of country.—*Santa Fe New Mexican.*

Useful Information.

Consumption of Rubber.—The consumption of rubber by our manufacturers continues as large as ever, imports amountiug to about 12,000,000 pounds per nnnum, chiefly from South America. The price ranges from 20 to 50 cents per pound, the cheaper grades coming from Africa and the finest from the valley of the Amazon, where the trees producing it abound over a vast region, one-half of the entire yield going to the United States. The consumption in the manufacture of shoes equals the demand for all nther purposes. In the manufacture of rubber from 3% to 10% nf sulphur, and various metallic oxides—chiefly lead and zinc—are combined with it; the quautity of the latter depending on the degree of clasticity and other properties required in the article to be manufactured; and to judiciously combine these substances with tho rubber in suitable proportions to produce the desired end, as well as in properly vulcauizing it nfterwards, requires great experience and skill. A certain degree of honesty on the part of the manufacturer is also essentinl to abstain from iutroducing mere ndulterating substances into his "compouuds," and thus cheapen the product at the expense of its quality.

A New Process for Copying Drawings.—The *Engineer* describes a new process for copying drawings, when only a few copies are needed, say 20 or 25, as follows: It has lately been brought out in Paris, and is said to be very useful. The apparatus consists of a shallow zinc tray, in which is contained a smooth, jelly-like, cream-colored substance, resembling in some degree partially solidified flour paste. The drawing to be copied is made with a special ink. As soon as it is dry it is turned face downward on the contents of the tray. The back of the drawing is tben rubbed over witb the band. The sheet is then lifted up, leaving much of the ink trnnsferred to the substance in the tray. A sheet of clean paper now takes the place of the drawing, and by rubbing it over gently with the hand an accurate copy of the original is obtained. Witb care, as many as 100 copies cau be had. When all that are needed have been taken, the composition in the tray is wasbed with a damp sponge, and is then rendy for use again. The nature of the composition bas not been made public.

Process for Preparing Sulphate of Baryta for Painting.—Pure amorphous sulphate of baryta may be used as a water color, but not as an oil paint. The sulphate gained hy precipitation hy sulphuric acid of the chloride or some other soluble baryta salt, called "blanc fixe," forms, mixed with linseed oil, a glassy, granular mass. The precipitate obtained by a solution of sulphate behaves similarly, although in an inferior degree. Meissner proposes to dry the precipitate obtained by means of a sulphate, and heating the same as soon as possible after precipitation to a red heat in a muffle. The mass is, while yet glowing, thrown into water. By this sudden change of temperature the sulphate of baryta is altered to a considerable degree. After being dried, ground and levigated with a small quantity of linseed oil, it mixes readily witb the required proportion of the latter, and forms a white paint equal in all respects to white lead. If the paint shall merely serve as a body for different shades of other colors, the latter must he added to the water.—*Deutsche Gewerbe Zeitung.*

A Varnish for Replacing Turpentine and Linseed Oil Paints.—Fr. Thies, of Bissendorf, prepares a varnish consisting of 100 parts of colophonium, 20 parts of crystallized carbenate of sodium, and 50 parts of water, by heating these substances together and mixing them with a solution of 24 parts of strong liquor of ammonia in 250 parts of water. With the mass thne obtained, the pigments are levigated without the addition of linseed oil or turpentine; the paint dries readily without the aid of a drier, and looks very well especially when varnished. Tbe paint keeps well even nnder water and becomes very hard. The cost is said to amouut to about one-third of that of ordinary oil paints.—*Deutsche Gewerbe Zeitung.*

Feathers in Textiles.—According to the Paris *Figaro*, the shops will soon have the new textiles in feathers and wool and cotton on sale. This is an inveution of M. Bourguignon, of Donchery, who has found hnw to weave feathers (deprived of the horny substance) and incorporate them with woolen and cotton yarns in proportions varying from 10% to 75%. Some very fine textilcs are thus made, and especially a flannel which for warmth and lightness is unapproachable.

Purifyino Oil of Cognac.—The beautiful green color so often met with in the oil of cognac, imported from Europe, is generally derived from an appreciable quantity of copper, which, of course, must render the liquor made from it highly injurious. To purify the oil heat it to about 114° F., and shake with one-tenth of its volume or a saturated solution of tartaric acid. Set aside for one-balf hour and filter.

To Chill Cast Iron Very Hard.—Use a liquid made as follows: Soft water, 10 gallons; salt, 1 peck; oil vitriol, ½ pint; saltpeter, ½ pound; prussiate of potash, ¼ pound; cyanide of potash, ½ pound. Heat the iron a cherry-red and dip as usnal, and if wanted barder, repeat the process.

Good Health.

Faintness and its Causes.

Fnintness consists in a temporary failure of the nctivity of the heart; the bleed, in consequencc, is not properly circulated. It does net rench the head, and the patient lescs clearness of vision and color, and, if uot prevented, falls to the floor, where, however, or even before reacbiug it, he recovers. There is no convulsion, and, though he cau scarcely be said to be conscious, he is uot profonudly unconscious, so as net to be able to be aroused, as happens in epilepsy.

There are all degrees of fnintness, from merely feeling faint aud looking slightly palc, to the state we have described; aud in some cnses the stnte of fainting is hardly recovered from well before it recurs again and ngain, for hours aud daye together. We nsed hardly say that euch cascs as the latter are altogether beyond the reach of domestic medicine. What are the causes of faintness? It is not very difficult to describe these. Some people are so easily affected that they faint if they cut their finger, or even if they only see the cut finger of another persou. All one can say of such persons is that their muscular fiber is not strong and that their nerves are sensitive. The heart, which goes on for ycars circulating the blood, is esssntinlly a muscle. It is weak in some people, stronger in others. As a rule it is weaker in women and strouger in men. Hence women faint more rupidly than mcn. Whatever weakens the heart and the muscles generally acts as a cause of faintness. Close, foul air is a common cause of faintness or of languidness. Anything which greatly affects the nervous syetem, such as bad news or the sight of something horrible or disagreeable, will sometimes cause fainting.

But of all causes of faintness, none are so serious as the loss of blood. The muscles, in order to act well, must be supplied with blood, and if the blood of the body is lost—if it escapes, either from a veiu opened purposely, or from piles, or from the source from which menstruatiou preceeds—iu excessive quantity, then faintness will happen. The degree of it will depend on the constitution and on the amount of blood lost. A loss of blood tbat would scarcely be felt by one person will be serious cause of faintness to another. Sometimes frequent faintness arises from becoming very fat, the muscular system of the heart being impaired by fatty deposit.—*Cassell's Household Guide.*

A Remedy for Whooping Cough.—Dr. Gartb (*Wiener Allgem.*) states tbat by placing xx. gtt. ol. terebinth. on a handkercbief, holding it before the face, and taking about 40 deep inspirations, to be repeated thrice daily, eignal and marked relief, followed by rapid cure in cases of laryngeal catarrh, is the result. In an infant 15 months old, in the convulsive stage of whooping cough, he directed the mother to hold a cloth, moistened as above, before it when awake, and to drop the oil upon its pillow when asleep. The result was markedly beneficial. In 24 hours the frequency and severity of the attacks were notably diminished, and by proper support by aid of stimulants, the improvement was rapid. Subsequently pertussis became epidemic in his vicinity, and he repeatedly used the drug in this way. He gave it to children of all ages, nnd in any stage of fever. The initial catarrh, the convulsive, and the final catarrhal stages were all decidedly benefited, the spasmodic attacks being in many cases aborted.

The Odor of Human Hair.—In *Le Progres Medical*, M. Galippe calls attention to the medico-legal value of the odor of the human hair. He asserts that from the simple smell of a lock of hair he can tell whether the lock has been cut from the living subject or whether it has been composed of hair that has fallen out. Hair-dressers have acquired this art, whicb is said never to fail them. Hair which has fallen out has a dull appearance, attributable to disease, and is not easily made up; it bas no peculiar smell. Tbe hair of the Chiuese has a characteristic odor of musk, which is so persistent that it cannot be concealed by cosmetics, for it cannot he destroyed by washing with potash. The hair of the Chinese has also a reddish tinge, and is polyhedral in section. Hair of hysterical patieuts has a peculiar and distinguishing odor which is most perceptible at the approach of a crisis. Certain hair is electrical, the electricity being developed more readily after rubbing.

Freshly Painted Rooms.—The impression that those who inhabit rooms freshly painted are in danger of lead poisoning has been shown by Dr. Clement Biddle to be quite unfounded. He bases this statement upon the result of the following experiment: He introduced into a close box a number of sheets of paper saturated with white (lead) paint, aud upon the bottom of the box placed a shallow dish of pure (distilled) water, previously tested to make sure of its perfect freedom from impurities, and from lead in particular. After an exposure to the atmospbere of the box for three days, the water-dish was removed, acidulated with nitric acid, and treated with sulphureted hydrogen, when not a trace of lead precipitate occurred. Dr. Biddle therefore attributes tbe colds and other unpleasant consequencee experienced by sleeping in freshly-painted apartments to tbe irritating action of the vapors of turpentine on the lining membrane of the air-passages,

*"The Telescope" by J. Herschel, Encyclopedia Brit.
†"The Telescope" by J. Herschel, Encyclopedia Brit.
‡Dr. Lommel, "Nature of Light."
§"L. Reynaud Lighthouse Illumination, "translated by Maj. P. C. Hains.
‖"L. Reynaud Lighthouse Illumination, "translated by Maj. P. C. Hains.
**J. Jamin, "Electrical Illumination," *Revue des deux Mondes.*

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Air Compressors, Clayton Pump Works, Brooklyn, N. Y.
Rare Business Chance, J. A. Worley, Cleveland, Ohio.
Hope Iron Works For Sale, Potrero, S. F.

The Week.

The blow of the pick, the ring of the hammer, the roar of the hlast, and the echo of the anvil have made sweet and constant music in the miner's ear during the months just passed, and from all sides, without exception, come reports corroborative of the richnese of the rnns. True, from some quartere complaints are already made of a lack of water, hut from the majority the only regret is that there is not more time each day to work. In California, San Luis Obispo reports finds of tellurium in paying quantities; Calaveras ie sinking shafts and erecting quartz mills; Inyo is staking out claime and opening new prospects; Nevada and Placer are resting somewhat from their lahors and beginuing to "clean up;" while Trinity ehows new life in the transfer of her hest mines into other hands and hetter management. In Oregon the mining prospect is over cheerful, and interest and activity are spreading every day. From Nevada the assertion comes that White Pine has developed rich placer diggings calculated to place her at the head of Nevada's gold producers and restore her wonted prestige as a mining camp. The prospects in Arizona continue hrilliant. In Colorado the Leadville excitement has been somewhat transferred to Silver Cliff, Ten Mile and Fairplay. Utah is producing large quantities of excellent ore, and Idaho is wide awake and only needs more capital to bring her to the front.

THE value of merchandise and produce exports since May 1st, aggregates $1,500,000.

Overrating the Value of Mining Properties.

Lying in Beaver county, in the southern pert of Utah, and reaching from the Oquirrh mountains to Arizona, is an extensive mineral region embracing San Francisco, Camp Floyd, Bradshaw, Star, Lincoln, West Tintic, Rocky, Beaver Lake, Pruess, Tom Paine and three or four other mining districts. This region abounds with ore-hearing veins carrying silver, copper, iron aud lead. As a general thing the ores here are of fair and sometimes of very high grade. Limestone is the prevailing formation of the country, with much porphyry, granite and hornblende, these rocks generally forming one or hoth walls of the lodes. The lead ores are mostly of the carhonate variety aud adapted to smelting. There are elso free milling ores here, hence hoth furnaces and mills are in use for reduction purposes. The lodes are as a general thing large, well walled and regular, occupying apparently true fissures.

The mines of Beaver county were discovered a numher of years ago, and although a good deal of work has since heen done upon them, the developments made are not at all proportional to the seeming importauce of the mineral deposits, the remoteness of thie region from railroads having tended to retard its progress. The Uteh Southern railroad having heen gradually extended until it has now reached the neighborhood of these mines, the latter are beginning to attract more attention; and it will not probahly he long till we shall eee mining operations pushed here as well as throughout other portions of southern and southwestern Utah with more energy and effect. The fame of the Ontario, Silver Reef, Leeds and other mines and mining localities lying off that way, has already tended to advertise that country and draw to its aid capital from ahroad.

While these mines are extensive and possess no doubt a fair share of merit, it should he horne in mind that two or three good properties do not make a country, nor does the presence of a bonanza in one lode argue anything in favor of another, however similar in its external features or close at hand. There is euch a thing ae a mining company doing a flourishing business on the reputation of its neighbor, without possessing any real worth of its own. We throw out these cautionary hints because efforts are heing made just now to dispose of certain of these Utah mines ahroad or to float their shares on the Eastern market at extravagant figures, and which efforts, if successful, must react unfavorahly not only upon the miniug intercsts of Utah, hut of this coast generally. We took occasion not long since to comment on the palpahle fraud threatened to he perpetrated on French investors through the sale to them of the old Telegraph mine over in that Territory at a price out of all proportion to its actual value. The corroboration of the view we then expressed of that husiness hy so good an authority as the *Engineering and Mining Journal*, satisfiee us of its correctness.

Latterly we observe that the shares of the Horn Silver mine, situated in the San Francisco district, southern Utah, are being dealt in at what we should consider pretty steep prices, this property having not long since been disposed of to Eastern investors. The Horn Silver is one of the famous mines of Beaver county, having been greatly extolled by the Territorial press, hy traveling correspondents, mining experts and others. It occupies a section of a strong lode and has been quite extensively opened up hy means of ehafts, drifts, crosscuts, etc., all in ore and without anywhere pinching, faulting or showing a disposition toward impoverishment, no horse or waste matter occurring in tbe ore body. The great mass of the ore rcquires reduction by emelting, though a portion of it can be successfully treated hy the mill process, having quartz and spar as a matrix. Active operations were commenced on this mine ahout three years ago, since which time a considerable amount of hullion has heen taken from it with good profits. Even with the comparatively small amount of developments made, large ore reserves have been established in the mine, some experts having estimated the value of the ore in sight at several million dollars. In ehort, the mine looks well, has heen properly opened and managed, has a good record and is really a valuable property.

But the question arises, is it worth anything like the money Eastern investors are paying for it? We think we have the means for answering this questiou correctly and intelligently. We have recently heen shown a letter from Col. Taylor, one of the most capahle mining engineers iu the country, who, at the solicitation of Eastern capitalists, examined the Horn Silver mine and gave his opinion upon it. From this letter, though not intended for the puhlic eye, we venture to puhlish such portions as hear directly upon the prohahle value of this property, which it will he eeen is placed at a very moderate figure. In this letter, under date of April 5th, 1879, occurs the following: "I examined the Horn Silver mine on the 24th nlt. The greatest depth to which the lode has heen opened up is 317 feet. No exploration of consequence has, however, heen made helow the 150-foot level. On this level the ore body shows a width of ahout 75 feet and a length of 200 feet, stoping having heen carried from this point up to the 50-foot level. The mine carriee a variety of ores, the major part consisting of gray carbonates whioh lie next to tbe east or hanging wall. In contect with this occurs a stratum of horn silver, mixed with chloride and ruhy ores, from which I ohtained an assay value of $247 per ton. I could form no close estimate of the extent of this stratum, as it had heen cut through at only two or three points when I visited the mine. It appeared, however, to make in greatest strength towards the south. The gangue is a light, sedimentary deposit, similar to thet found in the Leeds district. The bulk of the ore here is of low grade, conteining ahout $40 in silver and 35% lead. The ore exposure, however, is great. Hardly ever have I seen elsewhere so large a hody of fair grade ore developed at the seme depth. It is also uniform in character and promises persistence in depth. The strength of the vein, the walls and country rock, point to a broad permanent fissure. Everthing considered, one million dollars might he regarded as a fair price for the property." Whether the above will be of any use to dealers in Horn Silver shares or not, we cen assure them the opinion is a candid one, and comes from a sonrce that entitles it to weight.

It may further be observed in this connection, that Prof. Clayton, of Selt Lake, during a recent eojourn in New York, has heen giving Eastern communitiee some wholesome and timely advice in regard to investing in mining properties and the practical management of mines, his suggestions heing intended to apply more especially to operatious in this same Utah Territory. And we cannot help ftbinking that these Eastern as well as French investors ought to consider themeelves fortuuate to get the benefit of the unbought views of men like Joshua E. Clayton, Rossiter W. Raymond and Isaac M. Taylor when about to engage in mining enterprises of magnitude, or to emhark their money in stock speculations. These views are of course hy no means infallihle, yet coming from a quarter so intelligeut and disinterested they furnish the best lights availahle for our guidance in a businese so inherently difficult and financially dangerous.

We Must Kill Them or They Will Kill Us.

We mean our foolish, improvident and healthdestroying habits. It is reduced to just that alternative. To go on without change is eimply to perish. We may talk ahout land grahbing, and monopolies and stock gambling, all had enough, but it is the evil habite of the masses that are their real oppressors, and unlese they can find emancipation from these their damnation is certain. There comes up from the million a moan of want aud a pleading for work; hut this same million the moment they have earned a dollar will rush off and spend the major part of it in some inexcusahly foolish or criminally wasteful manner. And thus their time, cnergies and means are consumed to no good, hut very ofteu to only a had purpose. Over a thousand men are idle on the Comstock. For months they have heen without work, living from hand to mouth, and mostly on credit. Then they get employment at four and five dollars a day in the Sutro tuunel. These are good wages, and with economy they could save more than one-half their earnings. But the most of them save little or nothing. The gamhlers and saloon-keepers get 75% of their wages. Half the huildings in the town of Sutro are devoted to dice, card dealing and the liquor traffic. A new whisky shop is opened there every day in the week, and a place of thie kind having been opened never closes. It is run day and night, week days and Sundays, and will so go on till the town suffers a collapse and the miners, joining the hrigade of the dead-broke, decamp in eearch of other quarters. So addicted is this class to these spendthrift waye and vicious pastimes, that the husiness prosperity of a mining camp can well he measured hy tbe number of these dens it is ahle to support.

But these and like follies are not confined to mountain towns and the miners. They are indulged in hy the masses everywhere. If in the city a man or woman is advertised to walk on a wager thousands flock to see them, gaping and gassing and working themselves into an excitement, even though the thing is a sell throughout. And so of the horse racee, billiard games, hoxing matches and other put-up johs of this kind. Start anything of the sensational order and it is easy to wring a few thousands out of the hard fists of the working people.

If an idle fellow gets him into an India ruhher eack and floats down Western rivers the people will gather in crowde and receive him with acclamations, firing rockets aud ringing hells as if some great conqueror had arrived at their place. Presuming upon the purient taste of the puhlic, an ignorant and vulgar creature of doubtful sex sets out to lecture, and makes the hueiness a financial success just hecause this undefined nastiuess happens to suit the popular nalate.

The misery and impoverishment of the masses are due mainly to their excesses and follies. They are slaves to their appetites and passions, and from thie hondage they can alone set themselves free. We have nursed into a troublesome vigor too many superfluous wants and must set about getting rid of them. We must reduce the calendar of our idle days, curtail unuecessary expenses and learn to live more within our means or our condition as a people can never he improved. And in effecting this amendment it will not do to rely upon the teacbings or labors of others, every man will have to he his own reformer.

The Lead Silver Mines.

Notwithstanding silver is growing slightly in favor, with some prospect of its free coinege here and its remonetizetion in Englend and perhaps other European countries, operations on the ahove class of mines are undergoing extensive curteilment by reason of the extreme low prices of lead. In Utah a large number of furnaces have already shut down, while at Eureka, the great smelting camp of Nevada, though they still keep their reduction works in full blast the most of tbe lead is piled up at home, being retained for hetter prices. That the chances of realizing this expectation are slender may be inferred from the fact that the production of this metal, already so greetly in excess of demand, is likely to go on at a rapidly increasing rate without any corresponding increment of consumption. More leed is, of course, every year being used, but the growth of this use fails to keep pace with that of production.

Utah, Nevada and Colorado heve heen of late yeare our principal lead-producing countries; Missouri and eome of the other Western States, for many years hefore the chief sources of home supply, having also continued to turn out this metal in diminished quantity. Just now Nevada ie meking the larger portion of the refined article, though hut little of it is going forward to market; the leading mines in this State holding back the most of their desilverized product, which, at the present prices of leed and cost of carriage, would hardly more than cover charges of transportation to the seaboard. Recently this industry has experienced some revival ahout Galena and in the lead-yielding districts of Missouri, whereby the bueiness is likely to be further prostrated through a growing competition hetween these regions of the Middle West and the Far West, each of which enjoys some advantages favoring cheap production peculiar to itself. In the former the plumhiferoue oree occur in great ahundance near the surface, the miner hardly ever pursuing them to any great depth. When he reaches a depth where hoieting hecomes lahorious or water troublesome, he ahandons his workings and starts in at a new place, thereby avoiding hoth outlay and risk The ores here are rich iu metal, transportation and labor are cheap, and while the original outlay ie small, the introduction of lahor-saving appliances have not heen neglected, nor have eystematic methods of procedure heen overlooked. In the Far West the ores carry a large percentagc of silver, hut they lie deep, necessitating heavy expenditure in opening and exploring the mines and hringing the ores to hank, hoth reduction and transportation, as well as labor, being here exceedingly costly.

While the United States have ahout ceased to import lead, we have still strong competitors ahroad for the markets of the world, England, Spain and Italy, all making more than enough for their home wants. For more than half a century England's yearly output has varied from 75,000 to 100,000 tons, her present annual yield amounting to ahout 57,000 tons, of which her domestic requirements ahsorb all hut 7,000 tons. England imports this metal from Italy and Spaiu and exports it to France, Russia and China. The working and administration of her own mines show the perfection of system and economy, that country being distinguished for everything that is cheap as well ae for advanced metallurgical skill. Lead mining is, however, on the decline in England, the number of hands employed at the husiness diminishing slightly every year, and the outlook not heing such as to encourage an expansion of the interest. The lead product of Spain amounts to ahout the same ae that of Great Britain, Italy turning out less but a variahle quantity. Germany produces ahout 50,000 tons annually, and varioue other countriee in Europe small lots, the total European product being ahout 250,000 tons per year.

The total product of lead in the United States amounted, in 1878, to 81,304 tons against 73,325 the year hefore. Of last year's production Utah turned out 19,310 tons; Nevada, 27,735 tons; Colorado, 6,500 tons; California, 3,857 tons; and Missouri and Galena, 23,902 tons. Comparing the product of these two yeare, Utah shows a falling off of over 2,000, and Missouri and Galena of 4,000 tons, wbile Nevada shows an increase of 10,000 tons, Colorado of 4,000 tons, and California of a few hundred tons. Our home consumption amounted last year to 70,908 tone, and our exports to 7,396 tons, of which we sent 725 tons in pigs and 1,350 tons in cartridges to Europe and 5,321 tons in pige to China. The consumption of this metal was larger last year than in 1877, and there is every reason to helieve our home requirements will increase steadily hereafter. That American production will, however, increase much more rapidly than consumption is a state of things that producers ehould anticipate and endeavor to find for the surplus a profitahle ontlet. Being so much nearer to the Orient than the European producer, we should he ahle to command the markets of China and Japan, which, if secured to our trade, would he ample to the ahsorption of our surplus production. At the heginning of 1878 ordinary lead was quoted in the New York market at four and a half cents. It afterwards fell to 3.05 ceuts, hut later in the year advanced to 4 cents, from which there bas since been a slight falling off in consequence of the large actual and prospective out-put of our bome mines.

Rewashing the Gold-Bearing Debris from our Mines.

Having tried in late nnmbers of the PRESS to point out to laboring men such localities as seemed most likely to afford them opportunities to get employment or to employ themselves, we attempt in turn to indicate as far as may be the places and classes of mines that most strongly invito the attention of capitalists and others desirons of investing in mining properties of an especially safe and permanent kind, and of which we believe more can be found in California than in any other country west of the Missonri river. We have here no mines that have made bullion like a few on the Comstock lode, nor have there been found in this State any such metalliferous deposite as those reported at Leadville. But we have mines that have yielded steadily and satisfactorily ever since they were opened, a period, in some instances, of 20 years or more. Our mines do not yield by fits and starts, producing enormously for a year or two and then ceasing for ten, or perhaps altogether. They are distinguished for their steady returns and staying qualities, some of our placer mines being noted in this respect. With the knowledge we have gained of our various mineral deposits and the means best adapted for opening and working them, we can calculate beforehand expenditure and income, and sometimes also the probable duration of their fruitful season with considerable closeness.

In handling the auriferous debris or tailings, likely soon to assume a conspicuous place among this class of our resources, we have data that enables us to make these estimates with approximate exactness. In no department of mining, indeed, can the way be seen so far ahead and so clearly as in this. Before embarking in the business we can measure the quantity of the stuff to be operated upon, ascertain its quality and compute very nearly the expense of outfit and the cost of moving it. It can also be seen beforehand how much water will be required, where it is to come from and what disposition is to be made of the waste matter after being subjected to a rewashing. As to both the manner of carrying on this style of mining and the results obtained, none need be in the dark, the business having been in active progress at several points in this State for a number of years past. The most notable examples of debris washing are to be seen on Canyon creek, near Gold Run, in Placer county, where two sets of claims, the Kinder and the Moody, have for a long time been in successful operation. From the former, and larger of these claims, the yearly clean-up has ranged from $20,000 to $60,000, the yield of the latter having been about one-third as much. At these places the stuff rewashed consists now almost wholly of the fresh tailings escaping from the two or three hydraulic mines running in the neighborhood, the older and richer deposits formerly lodged in Canyon creek, having been long since run off. And yet with only this poorer material the owners of these claims clean up in the aggregate a yearly average of at least $50,000, four-fifths of which consist of net profits. The cost of these properties, purchase money, equipment and everything else included, falls considerably short of $100,000. But this plan of catching up the debris discharged from active mines is not extensively practiced, owing to the limited quantity of material so to be had and to a general lack of facilities for carrying it on successfully.

It is upon the tailings that have lodged in the beds of the gulches and streams which afford outlet to the hydraulic mines, and there accumulated in immense quantities, that this class of operations are to be prosecuted upon a large scale. While this material is so very abundant, filling the beds of large rivers continuously for many miles, only in a few localities does it exist under conditions favorable to profitable rebandling. There are billions of tons of this gold-bearing sediment with which nothing can in all probability ever be done, except to use the alluvial bottoms that will ultimately be formed from it for agricultural purposes. There is a stretch of 40 miles of this stuff on Bear river, 20 or more on the main Yuba, and twice as much on Feather river and its tributaries, to say nothing of the American Fork and other streams, that is not likely to be further disturbed by the gold seeker, there being nowhere sufficient fall to run it off. In process of time, the richer portions of it may be lifted up with powerful steam dredgers, or other appliances, and passed through sluices, but for the present all this large amount of these slums may be counted out in estimating the quantity available for mining purposes. But after this abatement there remains still a good deal of this stuff that can be handled to advantage, this remainder embracing much the richest portion of it.

Beginning on the north the first considerable deposit of this auriferous debris met with occure in Plumas county, where it fills the channel of Slate creek for several miles to an average depth of 20 or 30 feet. As is the case at two or three other points, the tailings here have been estopped and kept from running off down stream by a rocky barrier, over which only the lighter and more worthless particles could escape except during floods, when much of the surface sand and gravel would also be swept away, leaving all save the extreme light films of gold behind. The cutting of a passage through this rocky barrier at the lower end of the deposit for a distance of a few hundred feet would afford an outlet through which the entire mass could be run off and precipitated down the steep canyon below. The entire expenditure required for cutting this passage, constructing flumes, sluices, undercurrents, etc., would not exceed $40,000 or $50,000. The cost of running a claim like this, once it were opened and outfitted, would be trifling, while the income could hardly fail to be large. That portion of these tailings that it would be necessary to command in order to inaugurate a successful operation here, is owned by a single company, who would convey a fair share of the property to parties willing to furnish enough money to put it in good working condition.

The next point at which we encounter these auriferous slums in great bulk, and under circumstances that admit of their easy utilization, is Bear river, in the main channel of which the quantity is estimated at 18,000,000 cubic yards, besides nearly twice as much lodged along its upper tributaries, making a total in this locality of 45,000,000 cubic yards at the least. The tailings here have gathered to an average depth of 50 feet, with a width of more than 200 feet along a linear stretch of 23 miles. It is calculated that they will yield from 30 to 60 cents to the cubic yard, or a total of $30,000,000 under a careful rewashing, this being aside from the value of the quicksilver and the sulphurets that they contain, and which may fairly be computed at several millions more. In order to move these Bear river tailings in a large way it will be necessary to construct a tunnel through the ridge that separates this stream from the North Fork of the American, a distance of nearly two miles. The heavy cost of a work of this kind has thus far prevented the enterprise from being carried out, though negotiations for the requisite funds have several times been nearly consummated, and failed only through extrinsic causes. That the project will find early execution we may safely conclude, in view of the splendid results that await its completion. A million dollars would more than suffice to build the tunnel and cover all other preliminary expenses, a sum hardly more than half the net revenues that might be expected to accrue every year after active operations were commenced.

Passing south to the Forest Hill divide, we come upon two very remarkable deposits of these tailings, the one resting in the channel of Indian and the other of Shirttail canyon. The former has recently been opened up and put in condition for working, and it is expected that the returns will be ample and remunerative. The latter, which belongs mostly to the estate of William C. Ralston, remains in the condition at which it was left at the time of his death, well prospected and partly opened up, but yielding nothing except to the predatory hordes of Chinese, who, attracted by the richness of the gravel, steal in and carry on rocker-washing whenever opportunity offers. That these people can make wages washing, by this inefficient means the poor surface dirt sufficiently attests the value of this material. This is, in fact, the richest, though not the largest body of gold-bearing debris in California. But there is enough of the stuff here for every practical purpose, the mass of it lying in this canyon being over 30 feet deep, 100 wide, and five or six miles in length. As on Slate creek, the tailings here are kept back by a rocky ledge at their lower end, and through which a passage must be cut for their escape. This would not be an expensive work, the total preparatory expenditure here being estimated at less than $40,000. It seems a pity that a property that could, with so little outlay, be speedily made largely and profitably productive, should be suffered to longer lie dead and neglected. It is indeed unaccountable that this mining debris has not everywhere been turned to better account, seeing how readily it can be worked, where it can be worked at all, and how sure are operations of this kind to bring large returns for the money invested. Although the field, owing to the causes mentioned, is contracted to a narrow limit, we can point the investor to nothing, in the whole range of our mineral resources, that promises better results than the rewashing of this wastage from the sluice and rocker of the early miner and the hydraulic operations of these later days.

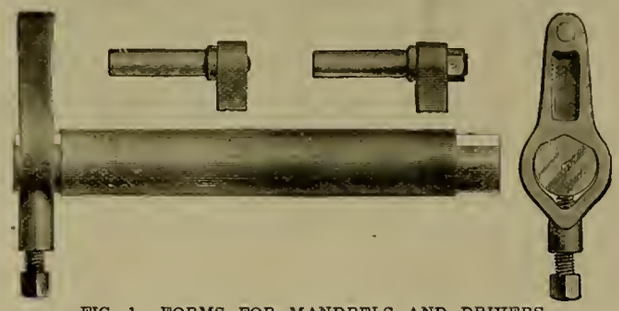


FIG. 1. FORMS FOR MANDRELS AND DRIVERS.

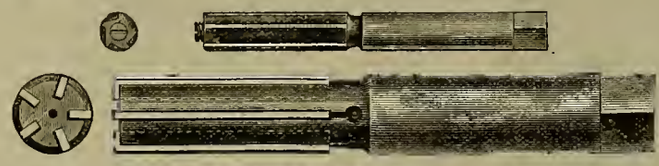
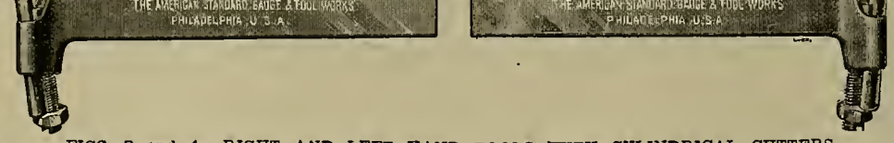


FIG. 2. EXPANSIBLE REAMERS FOR MACHINE FITTING.



FIGS. 3 and 4. RIGHT AND LEFT HAND TOOLS WITH CYLINDRICAL CUTTERS.

FIG. 5. SWIVEL LATHE TOOL.

No Cause for Alarm.

It is now pretty generally believed that the provisions of our new Constitution if fairly carried out will work no serious detriment to the mining interests of California. In this view none are now more ready to concur than the recognized friends of these interests, all of which claim that every department and branch of this industry will go on and prosper much as before. The claim that stock operations or any portion of them that legitimately belong here will be transferred to the East is repudiated on all hands. San Francisco will remain, as she has always been, headquarters for all important transactions, both speculative and practical. Nothing can divest her of her supremacy in the mining world or lessen the power which from this point has directed and energized nearly all the great mining movements on the coast. The machinery of the new Constitution may jar a little at first, but we will be able to so adjust the gearing that all will, in a little time, run smoothly. If through the instrumentality of the new charter or the laws made under it certain existing abuses shall find correction, so much the better, and if through like means some discouragements to stock gambling should be interposed, the fact would not be insupportable. In regard to the provision interdicting the stock sales on margins, it will be strange if dealers do not devise a method to evade any bad results.

In regard to the taxation of mining shares, these will of course be assessed at their actual and not at their nominal value. At the rate they are now selling, the value of all the mining shares listed on the stock boards of San Francisco would not exceed $45,000,000 or $50,000,000. Were they taxed 1% on their actual value, the amount would be less than half a million, a total that could hardly be considered ruinously oppressive. Estimated on the basis of their nominal value, these stocks would reach a valuation of three or four billion dollars, wherefore it is evident that no such rule for their assessment will be adopted.

MORE silver legislation is before Congress.

Lathe Tools for Working Standard Sizes.

Following the description of the American standard measuring machines and gauges, which we have given in the last two issues, comes the consideration of tools. In Mr. Richards' paper, before the Franklin Institute, are descriptions of some new designs by the American Standard Gauge and Tool Works, of Philadelphia, which we shall reproduce as follows:

The maintenance of standard sizes in a machine shop involves a good many things besides gauges, but fortunately nothing which should not be provided at any rate. Turning mandrels, for example, must be kept up to correspond. In former times turning mandrels were made of iron, consisting generally of scrap pieces of various lengths, and were usually turned off to fit each time they were used, and on the whole constituted what might be called a nuisance in a machine shop. Now it is evident that if holes are bored to uniform size, one mandrel of each size will do in a tolerably large shop, and if that mandrel is made of steel, hardened and ground to size, the expense of "maintaining it," as we may say, is reduced to a minimum.

The engraving, Fig. 1, shows a very good form for mandrels and drivers also. The ends are shaped with two polygonal sides, which fit into a corresponding seat in the driver, as seen in the end view. The driving studs, as shown on the smaller ones, are separate, and can be removed if not required.

Fig. 2, shows reamers for machine fitting, which can be expanded as they wear away. The smaller one is drilled out centrally, and then mortised between the blades, so that a conical plug forced in by the screw at the end expands the center of the reamer. The larger one is a blade reamer of the usual type, and needs no explanation.

Among the tools made at the gauge works, in Philadelphia, but in no way connected with gauging, are tool stocks with separate or detachable points, held by screw-keys in a very secure manner. A great many modifications of such tools have been tried in this country and also in Europe, but none except the present form seem to have met the expectations of their inventors.

In Figs. 3, 4 and 5, are shown side views of such tools, those for flat cutting having cylindrical cutters or points, a form not so commonly used here as in England, but having more endurance for heavy cutting than pointed tools. Tools of the kind shown in Figs. 3 and 4, are in general use at the Cornwall Iron Works, in Birmingham, England, where the expense of cutting and shaping iron, in so far as the writer can judge, has been reduced to its lowest limits.

The purposes arrived at in such tools are not always apparent at a first examination, and may be briefly mentioned as follows: (1) The points, being only small pieces can be made of finer steel than can be afforded for solid tools. (2) The points can be instantly removed or replaced without disturbing the tool stock. (3) The points being duplicates, no time need be lost in sharpening, a fresh point being inserted when necessary. (4) Tool dressing, an expensive and generally unsatisfactory branch, is dispensed with. (5) In grinding the tools a large number can be treated at one time; and there being but one grinding angle and that a constant one, no skill is required in the operation. (6) The hight of the point of the tool can be regulated at pleasure, thus avoiding what is called tool raising appliances on engine lathes.

The screw-cutting modification will be understood without further explanation, but it may be mentioned that in practice it has proved wholly successful.

The cylindrical point tools are modifications of quite an old invention, originating in Glasgow, and one of the examples shown is from England, where tools of this kind are gradually coming into use.

THE SOUTHERN PACIFIC.—The Southern Pacific railroad has suspended the work of extension on their road East till November or December next. It was the intention to stop when Maricopa was reached, but having more material on hand than was needed in carrying the construction to that point, contrary to expectation, the road has been prolonged some distance beyond, where it will now rest till the end of the year. There are many reasons for the suspension, not least among these being the impracticability of working in the hot summer season. The company are to be praised for the vigor and perseverance they have shown in pushing the road to its present termination in so short a time, and it is to be hoped that when building is resumed again the same activity as heretofore will prevail in pushing it forward to meet the Arizona Pacific or the Atchinson & Santa Fe road, and thus open up the southern portions of the State to direct communication with the Mississippi valley.

CHAS. M. PECK, Secretary of the Redington Quicksilver Mining Co., has absconded from San Francisco with $10,000 of the company's funds.

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The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device having already occasioned several deaths and other serious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

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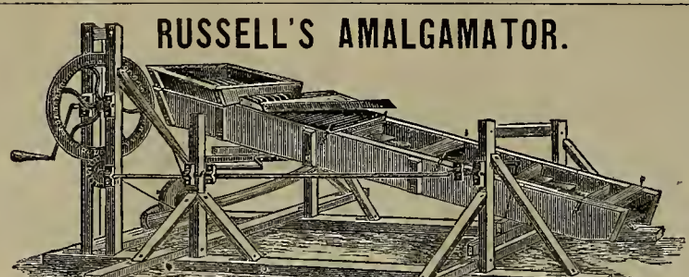

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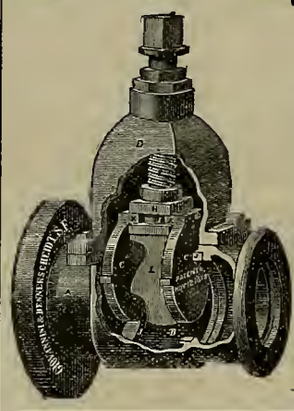

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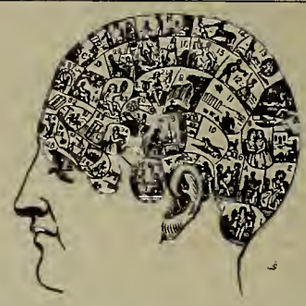

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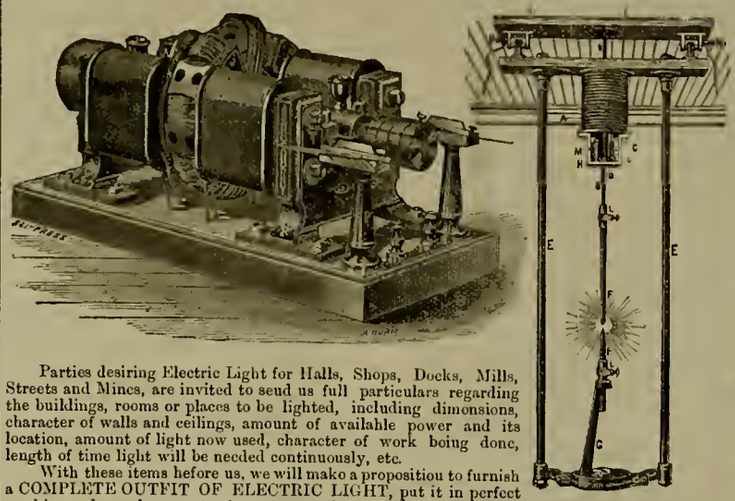

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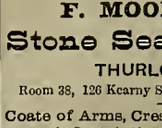

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Continued from page 333.

CROWN POINT.—The winze is within 10 ft of the 2700 level. The north drift, 2500 level, is making 40 per week outside the ledge.

WARD.—The shaft is being extended on down as usual, and is now 1445 ft deep. The material has changed of late, and become much harder and carries less water.

HALE & NORCROSS.—The east drift, 1620 level, has been in short, tough and bad-working ground, but has got through it into that which admits of better progress again.

JULIA CON.—The work of repairing the south drift, 2000 level, has been continued as usual. The heat in the mine is very oppressive and hinders operations.

UTAH.—The incline is making usual progress, the bottom 520 ft on the slope below the 1350 station, and in good sinking ground. The flow of water is light

SAVAGE.—Retimbering the incline and repairing the north drift, 1600 level. Repairs to the 1600 bob-pit have been completed.

MEXICAN.—By the 1st of June the joint incline winze from the 1600 level will be connected with the upraise from the 2000 level.

YELLOW JACKET.—The new shaft is 2540 ft deep. The drift on the 2500 level is in 66 ft.

ANDES.—The new upraise from the 350 level is up 50 ft. Prospecting from the former upraise has been commenced.

SUTRO TUNNEL.—Working between 1,200 and 1,300 men, including about 100 carpenters constructing the box for the sub-drain,

CON. VIRGINIA.—The yield of the mine is being increased. The joint California drift west on the 850 level is still in hard porphyry, its face 135 ft from the shaft. Joint California west crosscut No. 1, on the 1850 level is now in 44 ft, and has its face still in quartz giving low assays.

LEVIATHAN.—The face of the north lateral drift, on the 750 level, has shown considerable improvement, more quartz and low-grade ore coming in. The ground is still very hard, but growing softer.

SILVER HILL.—The work of creating a sump for 1300 level of the incline is going on. The drift north, 1100 level, is averaging five ft per day.

TROJAN.—Work has been going on through the week from the 2d and 3d stations as usual, and is making good progress.

LADY BRYAN.—Sinking the sump below the 750 level and drifting north and south on the 600 level. The face of the south drift is in quartz, and the north drift is between two bodies of quartz,

OVERMAN.—The work of putting the drain in the north drift, 1600 level, has been completed and work in the face resumed.

NEW YORK.—The work of extending the incline below the 1200 level is making usual progress. The new incline engine works perfectly.

CALEDONIA.—The blower has been placed in the drift, 1600 level, and sinking resumed in the winze below that level.

MT. HOOD & VANCOUVER.—The drift on the 1400 level has been sent 190 ft toward the ledge.

BELMONT DISTRICT.

BELMONT.—*Courier*, May 17: The work of development below the 300 level has been continued without interruption during the past week with good results, showing the ore body much larger than expected. In the 300 level drift running from shaft, they have two and a half ft of vein matter and quartz, all of which assays from $10 to $25 per ton. They are now about under the Transylvania ground, with this drift, in which was found a fine body of ore near the surface, and as there has been no prospecting done in this part of the mine below the old incline water level, they feel confident of finding a body of ore. The bad air has stopped work in the drift running from south raise, but they will make the connection before the end of the coming week.

HIGHBRIDGE.—They have cut across the ledge 140 ft south of shaft. At this point it is 12 ft wide, solid and carrying some good ore, and indicates being close to the ore chimney they expect to find on this level. It will take about 10 days to extend the crosscut across the ledge 70 ft from shaft. Other work progressing as usual.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, May 18: The following work has been done in the several levels without any change to report: Fifth level—East drift has been continued 22 ft, and is now in 86 ft. Seventh level—Northwest drift has been continued 16 ft, and is now in 40 ft. Started drift running southwest and continued the same 50 ft. Thirteenth level—East drift has been continued 18 ft, and is now in 58 ft; the west drift has been continued 17 ft, and is now in 64 ft. The incline has been sunk 20 ft, and is now 84 ft below the station.

FOURTH OF JULY.—The developments in the mine of late have been of the most favorable character. The vein of ore found in the bottom and north end of the cave, 50 ft above the lower tunnel level, has materially improved, both in size and quality of the ore. They have now at the Richmond furnace 30 tons of first-class ore, which was sampled and paid for on the 13th inst.

HAMBURG.—East crosscut from south drift, 600 level, has been advanced 10 ft, making a total of 48 ft; the face in the same favorable vein matter, with a seam of good ore to follow. In drifting south from end of west crosscut, 600 level, the quartzite gave out. They are now continuing west crosscut, which is in very lively vein matter. Above 250 level they are getting a considerable amount of first-class ore. They have commenced shipping ore to the Richmond furnace. Will have samples taken and assays made during the coming week.

PARADISE DISTRICT.

STREET & BLANCHE.—Paradise *Reporter*, May 17: This is a tunnel-right claim, and is being prospected by a three-shift force of two men to the shift. The main tunnel is in about 200 ft, and is being pushed ahead at the rate of three ft every 24 hours. The prospect for striking something very rich and deep is very good, as several prominent ledges crop boldly across the course of the tunnel. The owners are doing their own work.

NOTES.—Work has been commenced on the lower tunnel of the Mammoth mine. About 10 ft of tunnel has been made, and in less than eight ft more will strike the winze from the upper drift. The force of miners is light at present, but will be increased as the mine is opened. Capt. Elliott has just received advices from Quin River, Rebel Creek district, informing him that Harpel & Co. have just struck the south extension of the Ohio ledge. Sufficient opening, however, had not been made to give particulars. The Willow Creek mining district promises to be a lively camp very soon. On the Ethan Allen a tunnel has been started on the ledge, and is now in about 15 ft. Several tons of ore, averaging $150 in silver per ton, have been piled on the dump. The course of the ledge is northeast and southwest, and the croppings for several thousand ft are from 15 to 50 ft wide. Messrs. Chittick & Wright have taken a contract to run a 50-ft tunnel on the ledge, with the privilege of continuing the work as long as both parties can agree. The mine is owned by Messrs. Williams, Adams and Burbank.

IDAHO.

NORTHWESTERN COMPANY.—Phillipsburg Cor. *New Northwest*, May 9: The mill is running steadily on Trout and Murray & Durfee ore. The output of bullion is fair and above average. Roasters chloridizing 10 tons per day. Sinking the Trout shaft is making steady progress. Bottom in hard blasting ground. A station is being put in and a level already started at a depth of 400 ft. This vein will tap the drift in 12 ft, and the ore chimney 100 ft from the shaft. A large amount of high-grade ore will then be ready for stoping between this and the 311 level. The ore stopes above 311 level wherever they are worked yield well. The mine presents the general characteristics of a true fissure vein. Walls, well defined, running east and west, the course of the lode is regularly dipping to the north, and about 75° from the horizon. The ores are argentiferous blende and native silver, with an occasional beautiful wire silver in quartz crystallization. The mine is thoroughly opened and worked systematically and economically.

ALGONQUIN.—The upraise from the 290 level, running east, on the hanging wall, has been stoped out and timbered to the 200 level. No change in character of ore or width of vein. A continuation of the stope to connect this upraise with the water level is being pushed ahead with dispatch. Face of stope in lime and dolomite, requiring heavy blasting. The west drift on the 250 level is in 40 ft from the crosscut; ground very soft and broken; water increasing daily. The face shows eight ft of vein matter, very promising in appearance, with a vein of ore 16 inches in width next to the walls. No output of ore; all work is exploration. Mr. Fisher has a large force of men on the Frost gulch road, and will commence excavating for the mill site.

The Mechanics' Fair.

The Fair Board of Managers of the Mechanics' Institute have already made preparations for the Fourteenth Industrial exhibition which, according to a resolution of the board adopted last year, is to open on the 5th of August next and close on the 5th of September. It is fully believed that the exhibition will be a grand success.

The board publish a circular for distribution, setting forth that "the great Overland excursion of 15,000 or 20,000 persons that is coming from the Eastern States to meet Gen. U. S. Grant on his arrival in this city in August next, will, no doubt, induce an unusual number of the people of this coast to visit the city at that time; and it is certain that anything placed on exhibition will be seen and examined by many more than usual, and by representatives of every great industry and improvement of the age."

It is to be hoped that all our mechanics and manufacturers will lend their aid to advance the interests of the exhibition and endeavor to make as fine displays of their products or specialties as possible.

The art gallery will be in charge of the San Francisco Art Association, as it was last year. Exhibitors will be given space and a reasonable amount of power and water free of expense. Following is a list of the managers: Irving M. Scott, J. A. Bauer, A. L. Fish, James Drury, Samuel Dinsmore, Isidor Burns, A. W. Starbird, D. A. McDonald, S. H. Wheeler, C. Waterhouse, Nathaniel Hunter, David Kerr, Edward McGrath, F. A. Frank.

The Secretary, J. H. Culver, has issued the following rules and regulations of the exhibition:

The building will be open for the reception of goods Monday, July 21st, 1879.

Application for space should be made on or before July 19th.

Motive power, steam and water will be supplied without cost, and the managers most earnestly desire all exhibitors of machinery to have the same in motion whenever practicable, as thereby the benefit of exhibiting, and the interest of visitors will be greatly increased.

No charge of any kind will be made to exhibitors for space.

Space will be awarded as early as practicable (after application for space has been received), consistent with proper arrangement of goods.

Articles arriving early will be stored free of charge to the exhibitor, and if not consigned to an agent, they will be properly placed on exhibition, but no freight charges will be paid by the managers.

The Board reserve the right to exclude from the exhibition anything they deem objectionable; as nostrums, articles of an explosive, inflammable, damaging or offensive character.

CRANSTON'S HYDRAULIC GRAVEL ELEVATOR.—The Cranston elevator is a device for raising gravel from mines by means of water, in localities where there is not proper fall for the gravel to be removed in the usual way. The device was gotten up a few years ago, and when introduced, few people thought it would work satisfactorily. Notwithstanding this, several machines are at work. At Wyandotte, Butte county, a 16-inch machine has been successfully running for over a year. There is also one at Columbia, Tuolumne county; a 12-inch one at the Layard mine, in Placer county; a 16-inch one lifting 29 feet on Ohio Flat, in Yuba county, etc. We gave a detailed description of the machine in the PRESS about a year since. One has recently been set up at Waldo, Josephine county, Oregon, and the owner of the claim writes to the inventor as follows about it: "I started the machine last week, and it is a complete success and the admiration of all who have seen it. It works fully as well as represented. I am raising heavy gravel 29 feet 9 inches, and can raise 12 or 15 feet more when necessary. I had not a bit of trouble with the machine, as it went off from the 'word go.' I am driving it with 315 feet of pressure, using a 2½-inch nozzle which discharges 154 inches of water, but I think a 2 or 2½-inch nozzle will do. When the excitement is over I will try the experiment so as to give me more water in the mine. That machine of yours has caused more excitement here and more talk than a presidential election. There was a certain class of people around here expecting to have a good laugh over it, but they had to do it backward, and acknowledge that the machine works first-rate." (Signed) Y. B. Desselles. Joshua Hendy, corner Mission and Fremont streets, is the agent for the manufacture and sale of these machines.

UNLESS the home government helps Canada to finish the intercolonial railroad the project will be indefinitely postponed.

News in Brief.

ALL is quiet in Alaska.

GENERAL disorder reigns in India.

THERE are over 20 saloons in Sutro.

ELKO wants rain to save its hay crop.

CHICAGO has suffered from a large fire.

CROPS on Union island appear remarkably well.

THE tanneries at Benicia are virtually shut down.

THE miners strike at Durham (Eng.) has ended.

SHIP-BUILDING in South San Francisco is brisk.

THE *Jamestown* has started for Sitka, as per orders.

FROST is destroying fruit in some parts of Oregon.

A HEAVY fall of snow occurred in Shasta on the 19th.

THE Central American revolution is gradually subsiding.

VESUVIUS has been in a state of agitation for some time.

NEW powder works are shortly to be erected at Berkeley.

ANOTHER great strike of colliers is threatened in England.

CROP prospects in all portions of the south are promising.

TWENTY-FOUR Nevada mills are at work on Black Hills ore.

DIPHTHERIA is prevalent at Sutter Creek Amador county.

THE weather is very hot in New England—100° in the shade.

A CONFEDERATE monument has been unveiled at Columbia, S. C.

SCHOONERS now cross the Coos bay bar without the aid of tugs.

THE Indian supposed to have murdered Paul Reiger is in custody.

GENERAL SUTTER is living at Litiz, Penn., in comparative poverty.

NEVER has agriculture been so profitless in England as at present.

THE Santa Barbara county wheat crop will be very large this year.

GERMAN towns are opposed to the proposed duties on corn and cattle.

THE Southern Pacific has decided to suspend work till next November.

OATS are heading out and fruit looking well in Douglass county, Oregon.

THIRTEEN cars and two engines were lately ditched near Verdi, Nevada.

INTERESTING fossil remains have been found during excavations in London.

SENATOR SLATER will soon introduce another Anti-Chinese bill into Congress.

CAPITAL punishment has been re-established in Switzerland by popular vote.

AN excellent sandstone quarry has been discovered at Boisefort, Oregon.

THE town of Halas, Hungary, is inundated and much damage has been done.

THE Washington (Yolo) cannery is putting up salmon at the rate of 1,000 a day.

Elkin's Amalgamator.

We examined one day this week the Elkin's "Boss Amalgamator," which is on exhibition and running in the basement at the northeast corner of Liedesdorff and Pine streets. It is very simple in construction. The machinery is supported by a frame so arranged that it can be taken apart and tied in bundles for convenient transportation, no part weighing over 150 pounds, the whole machine weighing about 500 pounds. On the frame is a long iron hopper, (into which all material may be sluiced or shoveled), in the bottom of which is a screw conveyor for feeding and measuring all material to be treated. At the lower end of this hopper is a shaking screen through which all material must pass, that separates all course particles, preventing their passing through the machine. From the screen it drops into a hopper on the upper end of a three-inch iron pipe, through which all material passes into the quicksilver chamber at the lower end of a cone-shaped cast-iron cylinder. It then passes through from three to four inches of quicksilver, and is forced by water up to the top of the cylinder through the overflow pipe and off. While passing from the quicksilver chamber it is met by a counter current of fine sprays of water, forced from a series of perforated hollow revolving arms, that washes and settles all fine or flour gold and quicksilver—thus preventing all loss of quicksilver and precious metals. At the extreme lower end of the large cone-shaped cylinder is the amalgam chamber or safe, which is always kept securely locked, thus preventing all loss by waste or dishonesty. Any ordinarily intelligent man can operate this machine after very little instruction, as successfully as the most skilled millman. It can be seen in operation at the address given above.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, from May 14th to May 20th, inclusive, $20,340; Northern Belle, May 12th, $2,825.72; Martin White, from May 11th to May 18th, inclusive, $16,867; Paradise Valley, May 13th, $7,682.62; Standard, May 17th, $18,209.28; Bulwer, May 17th, $17,188.75.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

NELSON O. & S. M. Co.—Object: To operate in Plumas county. Capital, $10,000,000. Directors—Archibald Borland, August Hemme, Robert N. Graves, Thaddeus B. Kent and Hermann F. Morken.

FOULK G. & S. M. Co.—Object: To operate in Mono county. Directors—G. W. Orayson, C. A. Burgess, A. H. Rutherford, T. Bell and C. X. Hobbs.

SILVER PEAK TUNNEL & M. Co.—Directors—Frank Doutrick, W. H. Clark, P. Edward Connor, E. N. Robinson and W. W. Bishop.

ORIENT PLACER G. M. Co.—Object: To operate in Sierra county. Capital, $100,000. Directors—Henry D. Dahnecke, John German, George N. Powell, Peter Schaffer and R. C. Standinger.

ALCHEMIST M. Co.—Object: To operate in Calaveras and Tuolumne counties. Capital, $1,000. Directors—Charles W. Otis, Allen Deetb, James Stratton, John W. Still and Jonathan Myers.

SILVER BRICK CON. M. Co.—Capital, $10,000,000. Directors—Francis Cutting, Samuel L. Stanley, E. B. Pond, Samuel Linkton and Hiram Crowell.

Printing Inks.

The people who read the newspapers, magazines, and printed matter generally of the day, have their attention called to the typographical clearness, neatness and perfection they display. And fewer still know that the excellence and superiority of the work is to a large extent regulated by the nature and quality of the ink used in the printing of it. It is a fact, however, for though the presses used be of the most improved patterns, the type and wood cuts fine and clearly cut, the paper heavy and of the best quality, and the printer lavish of his care and skill, yet if the ink be of inferior kind the attempt at good work will invariably go for nothing.

Printing ink is a preparation very different from any of the inks used for other purposes, and calls for no little attention and skill in its manufacture. It should be soft and adhesive, readily attaching itself to the surface of the type, and as easily transferred to the paper pressed upon them. It should dry quickly, and at the same time not be easily removable from the paper by mechanical means. To the eye, good printing ink appears glossy and somewhat oily. Its texture should be without grains, and its tenacity such that it will leave but a short thread attached to a portion drawn out. The principal ingredients used in its manufacture are resin, linseed oil, lamp-black and other coloring matters.

The inks are made of all qualities to suit the demands. Cheap inks are a necessity, for printers cannot afford to do cheap work with costly materials, and many advertisers prefer to do more advertising in this cheap way than to pay for the cost attendant on more elaborate productions. After repeated tests we have settled down to the almost exclusive use of inks manufactured by Chas. Eneu Johnson & Co., of Philadelphia and New York. This firm manufactures every kind of ink, making a specialty, however, of first-class inks. Their inks are well known and largely used in all the States. We have long used ink supplied by this firm at reasonable prices, and our present issue illustrates satisfactorily its quality and character. It is emphatically a good ink and well calculated to give satisfaction. One special recommendation for all kinds of Johnson's inks, is their permanency and uniformity of quality. All good pressmen know the difficulty, or we may say impossibility of producing good printing continuously with any brand of ink which varies from time to time in quality, is "capricious," or "balky," as damaging results are bound to follow and vex himself as well as the authors and publishers of the works he prints.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

EXAMINE the accelerative endowment plan, as originated by the Mutual Benefit Life Insurance Co., of Newark, New Jersey. Assets, $30,533,429.94. Lewis C. Grover, President; L. Spencer Coble, Vice-President; Benjamin C. Miller, Treasurer; Edward A. Strong, Secretary; Bloomfield J. Miller, Actuary. Send for circulars to James Munsell, Jr., agent of insured, 215 Sansome St., San Francisco.

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Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., May 2f, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, May 21, 3 P. M.

SILVER, 1@70.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 38@39.

LONDON Consols, 98 13-16; Bonds (4%), 105.

QUICKSILVER in S. F., by the flask, ₱ lb, 40@41c.

Mining & Scientific Press Patent Agency.

PATENTS obtained promptly; Caveats filed expeditiously Patent re-issues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences Prosecuted; Opinions rendered regarding the validity of Patents and Assignments; Every legitimate branch of Patent Soliciting Business promptly and thoroughly conducted.

Intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons, and our success and business are constantly increasing.

The ablest and most experienced Inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

DEWEY & CO., Patent Agents,

Office—202 Sansome St., N. E. Cor. Pine, S. F.

A. T. DEWEY. W. B. BWER. G. H. STRONG.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 17th day of April, 1879, an assessment (No. 1) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin to the Secretary, at the office of the Company, No. 314 Bush street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of May, 1879, will be delinquent, and advertised for sale at auction; and unless payment is made before, will be sold on Monday, the 16th day of June, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Mount Jefferson Milling and Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Garrote Mining District, Tuolumne county, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 6) levied on the 21st day of March, A. D., 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
Condee, G M, Trustee	32	3000	150 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	44	800	40 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	43	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	40	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	50	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	51	2000	100 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	54	1000	50 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	55	1000	50 00
Condee, G M, Trustee for the Mount Jefferson M & M Co.	58	11080	554 00
Fassett, N C	21	500	25 00
Fassett, N C	20	1000	50 00
Fassett, N C	22	500	25 00
Fassett, N C, Trustee	7	500	25 00
Fassett, N C, Trustee	8	500	25 00
Smith, O, Trustee	40	1000	50 00
Smith, O, Trustee	41	500	25 00
Smith, O, Trustee	42	500	25 00

And in accordance with law, and an order of the Board of Directors made on the 21st day of March, 1879, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the Company, on Tuesday, the 27th day of May, 1879, at the hour of three o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

R. N. VAN BRUNT, Secretary.

Office, 318 Pine street, Room 6, San Francisco, Cal.

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LAWRENCE BARRETT.

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THOMAS MAGUIRE.....Manager.
F. LYSTER.....Acting Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

THE MILLIONAIRE'S DAUGHTER.

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Nos. 107, 109 & 111 Front Street, S. F.

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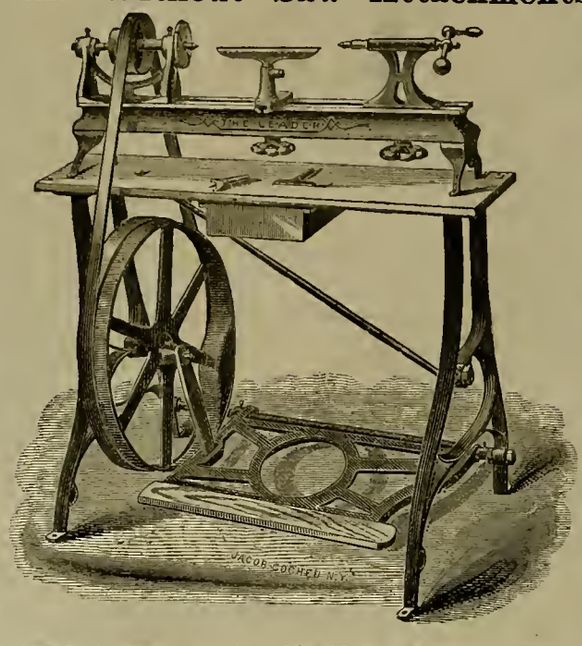

This Lathe has been made especially to meet a want felt by many for a really good and substantially made Foot-Lathe at a reasonable price, and we think that we can safely say that it is by far the best Lathe ever placed on the market at the price asked. The bed, head and tail stocks are of Iron; the spindles of steel. The bearings of the head stock is conical, so that the wear can be easily taken up.

Material eighteen inches long and eight inches in diameter can be turned on it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face-plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
Price of Lathe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.

Chuck, for drills ⅛ and under, Price.....$1.50
Chuck, for drills ¼ and under, Price.....$2.25

They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*

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With Geared Heads, Automatic Feed, quick return to Spindles; Multiple and Lever Drills; Blacksmith and Carriage Makers' Drills; Post Drills to run by hand or power. Radial Drills, Suspension Drills with geared head, Automatic Feed.

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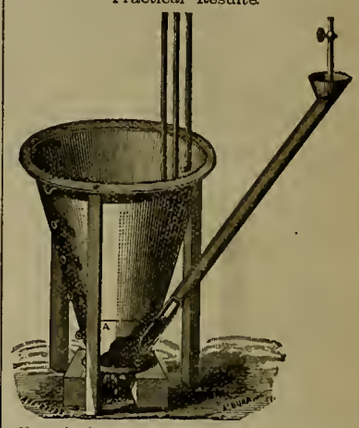
Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapnese, Lightneee and Practical Resulte.



No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

E. K. STEVENOT,

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REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

NOTICE

TO THE

MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Works, are the only parties authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the Licenee of thie Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

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NEVADA.—Grand Prize, Star, Martin White, Highbridge, Columbia, Alexander, Paradiso Valley, Jefferson, Leopard, Eagle, Endowment, Independence.
ARIZONA.—Tiptop, Tiger, Pock, Hackberry, Corbin, Tombstone, Bradshaw.
OREGON—Monumental.
MONTANA—Alice Mine, Butte City.
MEXICO—Trinidad, Harmiguera, Plomoses.
PERU—Cerro de Dasco.

RANKIN, BRAYTON & CO.,

Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned as they will be vigorously prosecuted and involved in heavy damages.

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Hoisting Enginss and Works, Cages, Ors Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

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Batteries for Dry or Wst Crushing, Amalgamating Pans, Sttlers, Furnaces, Retorts, Concsntrators, Ors Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Wsll Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for uss on land. Water Pips, Pump or Air Column, Fisb Tanks for Salmon Canneries of every description. Boiler repairs promptly attended to and at very moderate rates.

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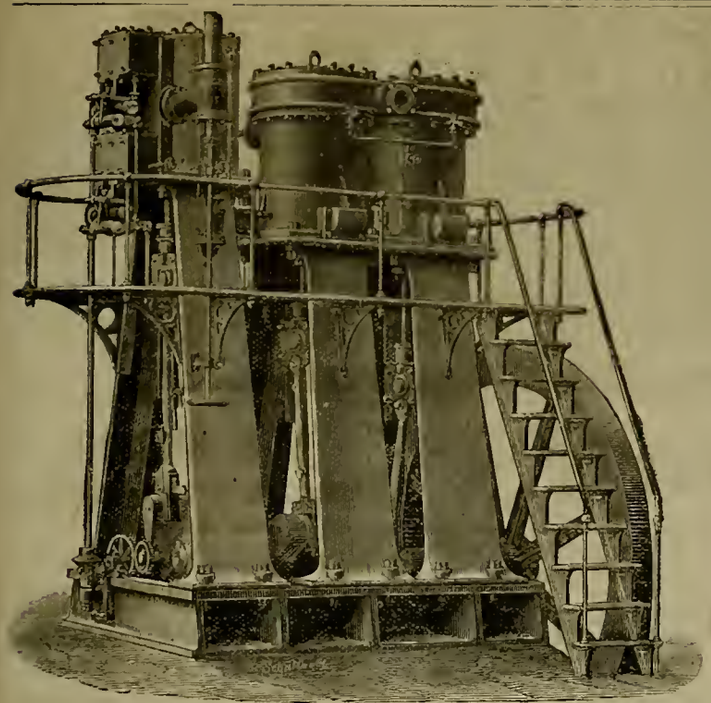

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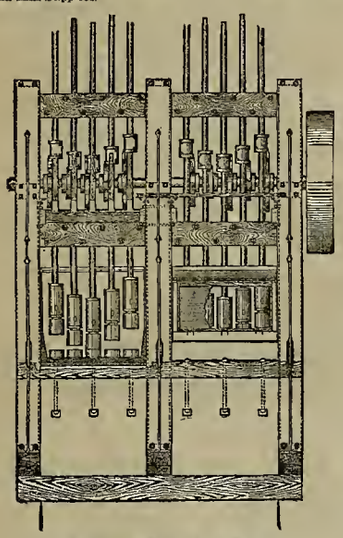

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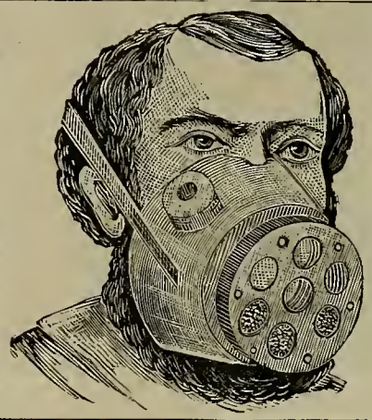

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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, MAY 31, 1879.

VOLUME XXXVIII Number 22.

He Would Know about the Comstock Felines.

"A subscriber and constant reader" writes asking to be informed, through the PRESS, who are the owners of certain mines on the Comstock, the extent to which such mines have been opened, whether they have developed pay ore, whether a general rise in the market would be likely to carry up the prices of these stocks or heavy assessments tend to depress them, and, finally, whether those mines will, in time, pay legitimate profit without extra heavy assessments. Touching the ownership of these properties and the explorations made upon them, information can be obtained by applying to the offices of the respective companies, much relative to the extent and progress of such explorations having appeared from time to time in our Washoe letters, published weekly in the PRESS. In regard to the other points, about which inquiry is made, we may say we have no exact information, though our impression is that the mines in question possess very little intrinsic merit, and will never be likely to enrich shareholders through their dividend disbursements.

As the letter alluded to is but one of many of similar purport constantly being received by us, we will make this an occasion for answering the whole of them in a general way. It has been our uniform practice to discourage persons of small means from investing in Comstock stocks, more especially in those of a purely speculative kind. We are of the opinion that the exploration of these mines should be left to be carried on by rich men or by parties of such considerable means that the loss of a few thousand dollars would not seriously affect them. In this belief we have repeatedly advised all others to abstain from having anything to do with either Comstock shares or mines. The man who cannot afford to lose a thousand dollars where he has half a chance in a hundred to win ten times that amount, should meddle with neither.

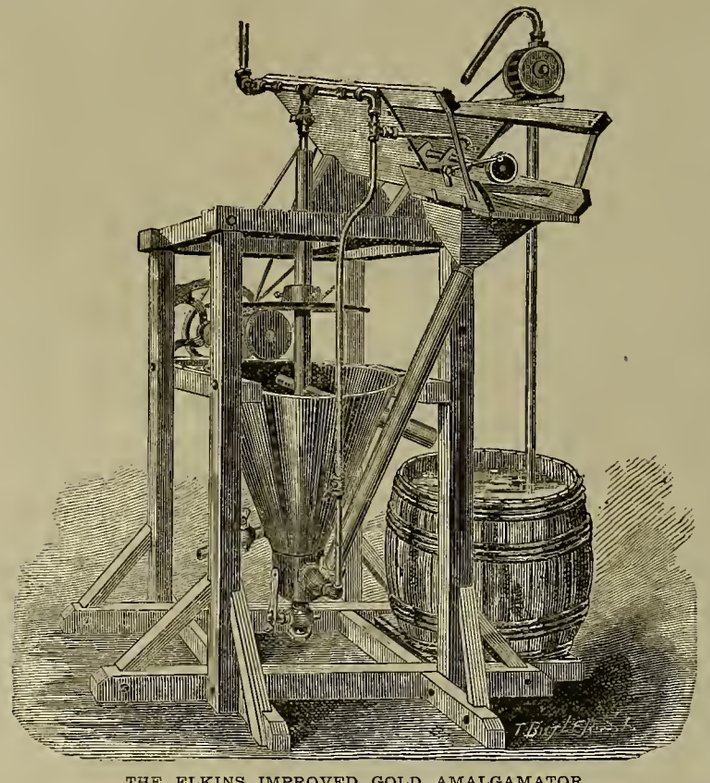
But how insensate must be that person who proposes to embark in this slippery business on information derived through the newspaper press or like imperfect channels. How can he hope for success relying upon such sources of intelligence when the keen, careful and sagacious dealer, after examining the mines in person and availing himself of the services of trained experts, after entering into every manner of combination and exhausting all the sharp expedients known to the profession, comes out very often a loser? It is true one buying hap-hazard might win on these stocks; but then it should be reflected that the day of miracles is supposed to be over.

We declare to our readers and mankind at large that we are possessed of no such knowledge as these inquiries imply, nor do we know of any hapless newspaper establishment that has attached thereunto an intelligence office for giving precise information about each and every mine on the coast, and directing just where to look for a bonanza on the Comstock. Moreover, we are ignorant of any means whereby the locality of such ore bodies can be designated, except it be the machine of Ai Peck, through the aid of which he can, as he claims, accomplish this very desirable end. As Mr. Peck is not a millionaire, he could probably be, through a small coin tender, persuaded to experiment with this machine, occult gift, or whatever it may be, for the benefit of the curious or confiding.

We make it a point to answer, according to the best of our ability, all inquiries in regard to mines and mining matters addressed to us. We like to impart to our readers all the useful information on these and kindred subjects that lies in our power, and we think the files of the PRESS will show that we have taken some pains to do so. But about properties of a merely speculative kind and which, like the mines in question, have at best but a precarious future, we do not pretend to keep posted; first, because those who control and run them do not allow outsiders to know anything more about their condition and prospects than they can help; and secondly, because it is supposed that parties intending to become interested in properties so dangerous will investigate for themselves.

The Elkins Amalgamator.

We spoke last week of the "Elkins Boss Gold Amalgamator," which we saw at work in the basement of No. 318 Pine street, and herewith illustrate the machine. The cut gives a very correct idea of the size, shape and appearance. It measures, screens and feeds itself, so little care is necessary in using it. The inventor says it is capable of amalgamating at the rate of about three tons per hour, and can be run by hand, steam, horse or water power. It has a rotary pump attached which enables it to use the water over again when water is scarce, consuming two or three hogsheads per day. When not using a pump a three-quarter-inch pipe will furnish a supply. The inventor claims that if not forced too fast the machine will save from 90% to 95% of the precious metal in the pulp. The machinery is supported by a frame made from three-by-three joist, about four feet square by five feet high, so arranged that it can be taken apart and tied in bundles for convenient transportation, no part weighing over 150 pounds, the whole machine weighing about 500 pounds. On the frame is a long iron hopper (into which all material may be sluiced or shoveled), in the bottom of which is a screw conveyor for feeding and measuring all material to be treated. At the lower end of this hopper is a shaking screen through which all material must pass, that separates all coarse particles, preventing their passing through the machine. From the screen it drops into a hopper on the upper end of a three-inch iron pipe, through which all material passes into the quicksilver chamber at the lower end of a cone-shaped cast-iron cylinder. It then passes through from three to four inches of quicksilver and is forced by water up to the top of the cylinder through the overflow pipe and off. While passing from the quicksilver chamber it is met by a counter current of fine sprays of water, forced from a series of perforated hollow revolving arms, that washes and settles all fine or flour gold and quicksilver—thus absolutely and positively preventing all loss of quicksilver and precious metals. At the extreme lower end of the large cone-shaped cylinder is the amalgam chamber or safe, which is always kept securely locked, thus preventing all loss by waste or dishonesty. Any ordinarily intelligent man can operate this machine after very little instruction. The price of this machine complete is $250, and the inventor says "the cost of running will not exceed 25 cents per ton in excess of handling the material." It is intended to work earth, gravel, pulp, mill tailings and black sand. Messrs. Elkins & Lynch, No. 318 Pine street, will show the machine at work to any one interested in seeing it.



THE ELKINS IMPROVED GOLD AMALGAMATOR.

Native Brass.

Of late years numerous specimens of brass-like alloys have been found on the shores of Lake Superior and on the Pacific coast, which claim attention from the assertions and general belief among Western miners that they are in fact native brass. As, however, in every case the specimens obtained have not come directly from the mines themselves and in no case through the instrumentality of scientific observers, the truth of the belief may be fairly questioned. The *Mining Record* gives an interesting account of specimens of this alleged native brass forwarded to them for analysis by Mr. Samuel D. Hill of Downieville. These specimens were found in the ravines along the south fork of the north Yuba river in Sierra county. They are small, somewhat flattened concretionary masses from three-fourths to one-fourth centimeters in diameter and without apparent crystalline structure. Their color ranged from dark reddish brown to yellowish white, their streak was faint yellowish white, and they were slightly incrusted with green carbonate of copper. Somewhat brittle, specific gravity of one specimen 8.33. An analysis of this sample by Dr. T. B. Stillman gave: Copper, 85.02%; zinc, 11.02%; antimony, 3.82%; iron, 0.9%; total, 99.95%.

THE financial trouble in Holland continues.

Ball's Improved Dredging Machine.

Mr. John A. Ball, the inventor of two dredging machines previously described in our columns, is now working a third one invented by him, which is the property of the South Pacific Coast Narrow-Gauge Railroad Co. This was built under Mr. Ball's directions and combines the features of the old dredges with various later improvements. The general mechanical principles are the same, but in detail much improved.

The principal difference in this dredge from the others is the peculiar arrangement of iron pipes with flexible joints, employed to convey the mud or earth on shore, after it is raised by the buckets.

The hull of the dredge is 75 feet long, 8½ feet deep and 30 feet wide. At one end is a "spud" strong enough to hold the dredge in place firmly at the same time allowing the after end to swing around, the spud serving as a pivot. At the after end there is a slot 24 feet into the hull, and projecting aft is a frame for the support of the ladders that carry the endless chains and buckets. From the upper to the lower shaft, over which the bucket-conveying chains pass, is 75 feet distance, the buckets running at an angle of 45°. The upper shaft is about 29 feet above water line, making the chute into which the mud drops from the buckets about 25 feet above water line. The lower end of the ladder is lowered, and as the chains revolve the buckets cut out and lift the mud, passing up and dumping their loads into the chute at the top of the machine. As the mud falls from the buckets into the chute it meets a stream of water from two No. 14 Hooker pumps, each of which has a capacity of 1,000 gallons per minute. The mud is thus churned and cut up by this stream, and driven into the mouth of the pipe leading to the shore. It is not so much on hydraulic force that they depend to drive the mud through the pipe, but by its own gravity; the mud and water entering the pipe at a higher point than the end where it is deposited, will run through. The stream is assisted, however, by a hydraulic jet entering the pipe under water, almost in a line with the flowing mass. The mud may be lifted from a depth of 22 feet below the scow, and is elevated, 25 feet above water line, before being allowed to flow off. The line of flexible pipes lies on the bottom of the river or creek, the shore end raising up over the bank to the point where the mud is deposited. It is now being deposited at Oakland creek, where the dredge is at work, about 16 feet higher than ordinary low tide. In digging the slip for the freight boats of the railroad company they have made a deep excavation and built an embankment on the bank, behind which the mud is led by the pipes. This space behind they have filled to a depth of from three to six feet. The pipes carrying the mud are 12 inches in diameter. When it is desired to lift the spud and move the scow to a new position, by reversing a valve the water is drawn out of the pipes which then fill with air and float to the surface of the water. The scow can then be moved without injuring the pipes; at all times when at work the pipes lie on the bottom so that no action of the waves caused by passing steamboats will injure them, nor is there any strain on the pipes.

There is a 12x20 engine and two boilers to furnish power for the buckets and pumps. They have no means of measuring the work accomplished, but the foreman calculated the day we saw the machine at work, that it had raised and deposited on the bank about 800 cubic yards, and thought a full good day's work would be 1,000 yards. The cost is estimated from seven to eight cents per cubic yard. The machine is now digging close up to the bank. The material flows through the pipe rapidly, and they have no trouble with the pipe in choking, as considerable water flows through with the mud. There are a number of improvements comprised in this machine which are worthy of consideration by those interested in dredging or excavating appliances. The feature of depositing the mud on the bank or levee is an important one in this country, as it does away with the expense of using scows and tugs to carry off the mud, depositing it where it will be useful in reclaiming low lands.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Occurrence of Artesian Water.

EDITORS PRESS:—Do the underground currents of water, which supply artesian wells, follow the conformation of the earth, ascending and descending like strata of rock, veins of ore and coal, at altitudes above the ocean level? Can you give the address of the most experienced, practical artesian well-borer in the State, and oblige a subscriber?—JOHN KNIGHT, Sanel, Mendocino Co.

The currents of artesian water may be said to follow the strata beneath the surface, because it is in certain strata that the water moves, but, of course, the curves of these strata cannot be always determined from the careless observation of the surface. Concerning the occurrence of artesian water Prof. E. W. Hilgard, in his article on the subject in Johnson's Cyclopedia, remarks as follows: "Artesian wells are most readily obtained where the geological formations possess a moderate inclination or 'dip,' and are composed of strata of materials impervious to water (rock or clay) alternating with such as, like sand or gravel, allow it to pass more or less freely. The rain water falling where such strata approach to or reach the surface, will in great part accumulate in the pervious strata, rendering them 'water-bearing.' Thus are formed sheets of water confined between two inclined, impervious walls of rock or clay, above as well as below, and exerting great pressure at their lower portions. When water so circumstanced finds or forces natural outlets, we shall have springs; when tapped artificially by means of a bore hole, we have an artesian well, from whose mouth the water may overflow if its surface level be below that of the head of pressure. The principle is substantially the same as that upon which artificial fountains are constructed. Even in the absence of properly water-bearing pervious strata, accumulation of water may exist in crevices or fissures.

"In regions where unstratified rocks prevail, or where the stratified rocks are much disturbed, the finding of artesian water becomes a matter of great uncertainty, and can, in general, be expected only at considerable depths and at low surface levels. In formations possessing but a slight inclination or 'dip,' the head of water pressure may be many miles distant, and a difference of level between its locality and that of the well may not be at all apparent to ordinary observation. It is thus obvious that the study of the geological structure and general surface-conformation of a region, is primarily needful in determining the probability of success in obtaining artesian water in any given locality."

Our querist asks for the most experienced and practical well-borer in the State. We do not know who is entitled to this distinction. The best we can do is to invite well-borers to write to Mr. Knight and give references to the work they have done.

Strikes at Tombstone.

The *Arizona Citizen* states that the developments during the past ten days upon the principal mines in Tombstone are undoubtedly the most important and satisfactory of any since work was commenced there. Upon the Contention the main shaft reached a depth of 162 feet and a drift started upon that level in as rich and well-defined a ledge of ore as any cares to see. The 113-foot level is now open for a distance of 360 feet, and the vein is continuous. Upon the dumps at least 1,000 tons of ore are piled.

Work upon the Lucky Cuss is continued with flattering results. On the lowest of the three shafts a body of very high grade ore, which promises to be extensive, was struck last week. The other shafts and tunnel show remarkably well also. The Corbin 15-stamp mill, which is to work the ore from this mine, arrived at the mill site on the San Pedro last Friday.

The big strike was made, however, in the Tough Nut, and it increases the value of that remarkable mine immensely. Heretofore this mine has been a puzzle even to the owners, for large bodies of very rich ore were found wherever any work was done, but up to last week no well-defined ledge had been struck. In the West shaft, however, is now found as strong and well-defined ledge lying between the limestone and porphyry, as is to be found anywhere. The width of the ledge we are not advised of at present, but it is known to be sufficient to make every one who knows of it very enthusiastic over the future of the mine and of the whole district. The discovery of this ledge gives for the first time a solution of the Tough Nut problem. It is now quite certain that two large ledges are in this mine, the one just found coming down from the West shaft and the other coming across from the work on the Good Enough claim and following the course of the Tough Nut gulch. The two ledges seem to unite at the original point of discovery at crosscut No. 3, where the largest ore body has been always thought to lie. It is the prevailing opinion among those best qualified to judge that the combined ledge continues along the gulch and through the Sweet Nut claim. Large dumps of ore are piled at the various shafts and cuts on the Tough Nut, and there is said to be enough ore in sight to wear out the mill which is now approaching completion on the San Pedro. Supt. Gird expects to have the mill finished by the 20th of this month, and to begin crushing regularly on June 1st.

Some Thoughts on the Glycogenic Functions of the Liver.

[Read before the Chemical Section by JOSEPH LE CONTE.]

II.—Disposal of Waste.

In my previous paper* I attempted to show that the well-known remarkable fact, that nearly the whole food absorbed from the alimentary canal is distributed through the liver before it reaches the general circulation, is proof that, in a very important way, the liver prepares the food for the uses to which it is applied in the animal body; and farther, that this preparation is accomplished by the glycogenic function. According to my view there are three sources of glycogen, viz: 1st. The whole of the *amyloids*. These are arrested in the liver as glycogen and redelivered as liver sugar, little by little as required, and burned. 2d. *Albuminoid excess.* This is split into a combustible portion which is delivered to the blood as liver sugar and burned, and an incombustible portion which is either urea or rapidly sinks into urea and is eliminated by the kidneys. 3d. *Waste tissue.* This is also split in the liver and disposed of like the last. There are the same three sources of vital force and animal heat, viz: 1st. The combustion of the whole of the amyloids. 2d. The combustion of the combustible portion of albuminoid food excess. 3d. The combustion of the combustible portion of waste tissues. Therefore the function of the liver is to prepare *all* the fuel of the body; and this fuel is only liver sugar.

Now it has been brought to my attention that my account of the disposal of waste is in conflict with the usual view of physiologists, which view is supported by many facts. Let us then state sharply the difference.

According to the usual view oxygen taken in at the lungs is carried by the arterial blood to the tissues; there seizes with avidity upon these at the moment of their decomposition, changes them into CO^2, H^2O and urea; and then these final products of combustion only are carried by the venous blood to be eliminated by the lungs and kidneys. According to my view, on the contrary, waste tissue is not burned or changed into final products at once, but circulates as incombustible matter dissolved in the blood; is carried to the liver and there prepared for final combustion and elimination, and only thereafter does it unite with oxygen to form CO^2 and H^2O. We see the contrast: which view is right? There are some facts which strongly support each view. The usual view that waste tissue is burned at once and only the final products of combustion circulate in the blood, is supposed to be sustained (1) by the fact that the change from bright to dark blood, the exchange of oxygen for carbonic acid, and therefore the combustion, takes place, principally if not entirely in the capillaries and therefore in contact with the tissues; and (2) by the additional fact that increased activity of any organ, *e. g.*, a muscle, is attended with increased heat, increased waste and therefore presumably of increased *combustion of waste.* But on the other hand my view is sustained by the experiments of Schiff, already alluded to in my previous paper. These experiments prove in the most positive manner, that poisonous waste is carried to the liver and there decomposed and made comparatively innocuous.

Here then are two incontestible facts. 1st. The combustion of waste takes place principally if not wholly in the capillaries, and therefore in contact with the tissues. 2d. The waste is not burned as such, as soon as formed, but must be carried to the liver to be prepared for final combustion. These two facts must be brought together and reconciled. I think this may be done as follows:

1st. It must be remembered that *waste* is but a *small fraction* of the material used as fuel; by far the larger portion of such material being *food* which never becomes tissue at all, viz: *amyloids* and *albuminoid excess.* Now these also, although they or the fuel made from them are confessedly carried and burned in the blood, are burned principally in the capillaries, and therefore in contact with the tissues. The reasons, then, for burning combustible *food* principally in the capillaries, would equally apply to burning combustible *waste* in the same place; and therefore the fact that combustible waste is burned principally in the capillaries is no argument that it is burned as soon as formed. Evidently then the question is not one which concerns the combustion of *waste* alone, but the combustion of *all* fuel. The question is: Why does combustion of the combustible portion, both of food and waste, take place, and therefore both heat and other forms of force are generated, in the capillaries and in contact with the tissues? The *final* cause is, indeed, plain enough: it takes place there, because there the force is wanted; but what is the *physical* cause, or the process which determines this result? There are probably several.

1st. The blood is much *longer time* in the capillaries than in any other portion of its course, and, therefore, even if the *rate* of combustion be *uniform*, the amount of combustion would be greater there than in any other place. And, moreover, if increased activity increases heat and therefore combustion, it does so because it also increases the blood supply.

2d. But probably the rate of combustion in the course of circulation is *not uniform.* It is probable that the tissues themselves are an apparatus for causing or accelerating combustion. The termination of nerve fibers in the tissues and the controlling influence of nerves over all functions suggests that the discharge or the arrest of nerve current in some way we do not understand, is the principal cause of combustion, and therefore of generation of force there. Farther, it has been suggested to me by Mr. Christy, assistant in the chemical laboratory, that the chemical process may possibly be something like this: Oxygen is carried by the hæmeglobin, the fuel is carried as liver sugar by the plasma, side by side in the same current; nerve discharge reverses the order of affinity, and the oxygen immediately leaves hæmeglobin to seize the sugar. In most tissues, such as many glands, etc., which are constantly active; and in all tissues, so far as the function of nutrition is concerned, the process is continuous and under the influence of the sympathetic or vaso-motor system. In muscular contraction, on the other hand, the discharge is powerful and periodic, and under the influence of the voluntary or reflex system.

3d. It is probable also, nay, almost certain that the first decomposition of tissue short of combustion, *i. e.*, the first formation of waste, being a descensive change—a change from a less stable to a more stable condition—is itself a process by which heat and other forms of force are generated. This of course takes place only in the tissues.

My view, therefore, is briefly as follows: The liver sugar formed from the sources already mentioned, first, commences to burn in the capillaries of the lungs; and second, continues to burn in the course of the arterial circulation. The combustion thus far produces only *heat.* But, third, the main combustion takes place in the capillaries, probably under the influence of nerve discharge, and this part generates not only heat, but other forms of force characteristic of the peculiar tissue. But the fact that the main combustion takes place in contact with the tissues has misled physiologists to believe that the tissues themselves are burned.

It seem to me that physiologists do not even yet sufficiently appreciate the function of the blood as a reservoir. The blood must be regarded as a reservoir, not only for oxygen and carbonic acid, but also and still more for *food*, for *fuel* and for *waste.* It is now well recognized as a reservoir for oxygen and carbonic acid, but not sufficiently for food and waste. The tissue-food of to-day is not used for building to-day, but the blood is drafted upon for materials for this purpose and resupplies itself from albuminoid food. The amyloid food of to-day is not burned to-day, but the blood is drafted upon for fuel and resupplies itself from the liver, while the liver in its turn resupplies itself from the amyloid food.* So, also, waste tissue of to-day is not mainly burned and eliminated to-day, but the blood is again drafted upon for fuel from this source, and resupplies itself from the liver and the liver from the tissues.

Finally, it will be observed that the view which I here present as to the disposal of waste, is, in some respects, intermediate between the view of the old physiologists, under the guidance of Lavoisier, and the modern view. According to the old view, the waste is dissolved in the blood, carried to the eliminating organs, especially the lungs, and *there* burned, with rejection of the products of combustion. The lungs are, therefore, the furnace of the body. According to the usual modern view, oxygen is taken into the blood, is carried to the tissues, burns there on the spot the waste, and the products of combustion are then carried to be eliminated in the lungs. The old view is right in supposing that waste is carried in the blood, but wrong in supposing it to be combustible, and therefore burned as soon as it meets oxygen in the lungs. The modern view is right in supposing that combustion takes place mainly in the tissues and not in the lungs, but wrong in supposing that it is the unprepared waste which is there burned.

* *American Journal*, Vol. XV., p. 99.

* The rapidity with which the fuel supply in the blood is exhausted by activity and restored by food is far greater in some insects, *e. g.*, bees, than in higher animals. In bees, one hour of activity without food entirely exhausts, while food restores in five minutes. This is the result of the extraordinary nervous and muscular activity of these insects.

AN OLD SETTLER.—The Tuscarora *Times-Review* is responsible for the following: About a week ago at the 500 level in the Grand Prize, a blast demolished the residence of a Preadamic frog. At all events, a rather diminutive specimen of that branch of the amphibian species was found among the rock thrown out by the blast. It was brought to the surface, and since that time has been quartered in a jar. When first brought into the upper world it was nearly white and almost transparent, but since then its back has changed to a dingy mottled green. It has no mouth, and, of course, has eaten nothing since its removal from its subterranean abode. Its eyes, which are never closed, not even to wink, resemble two small black glass heads, and are about as expressionless. They are evidently sightless, as objects brought within a hair's breadth of them fail to effect any movement or change in them whatever. Its shape is not like others of its species, except its forelegs and claws, which are disproportionately long. Its sense of feeling and hearing appear to be ordinarily acute, and it is nearly as lively as its surface-raised brethren usually are under similar circumstances. While we will not venture any surmise regarding its history prior to its liberation, we will vouch for the truth of the above narrative and description.

The Wonderful Sinks.

In a late issue we published an account of the Nevada sinks, taken from the Eureka *Sentinel*, maintaining the view that they retain their level through evaporation and have no subterranean outlet. To this the Inyo *Independent* adds: That the sinks and lakes of the Great basin are held to their levels mainly through evaporation is undoubtedly the fact of the case. Mono and Inyo counties have the most notable sinks of the kind in the world. Probably Big Owens lake receives as much or more water than the Humboldt sink. It is not true, however, that the quantity of water is at all times the same; the great lake is now some four feet higher than 11 or 12 years ago. The amount of snow-fall in the mountains is the only thing governing it. In summer heat the total amount of evaporation from its vast expanse of water is incalculable, and doubtless furnishes moisture for the winter snow-fall of the adjoining high Sierras. The minute particles of minerals and alkalies gathered from the soil by the inflowing streams are left in solution in the lake, and during the centuries of this process the lake has assumed its Dead sea character, in which no living thing can exist, save worms and a small nondescript water-fowl. Mono lake is fully 12 feet higher than it was many years ago. At the northwest corner of the lake, near the Freuchman's, the posts of a former sheep corral can be seen far out into the water. A pre-empter recently appeared in the United States Land Office to prove up his claim located five or six years ago. Of his 160 acres he stated that all but 40 acres was under water, and he very naturally did not wish to pay for more than that amount. Some ascribe the fact of the water rising to an increased amount of snow on the mountains during the winter over former times; some believe that the turning of Virginia creek into the lake has caused the change; while others hold to the theory that some secret outlet to the lake has become filled up. Whatever may be the cause, the fact is evident that the lake is rising at the rate of a foot or two a year. There are numerous evidences that in former times Mono lake extended over a vast extent of territory—certainly 10 times as great as now. Is it not possible that in course of time it may again assume its ancient proportions?

Requirements of the Timber Culture Act.

William R. Wheaton, Register of the United States Land Office in this city has written a letter, giving information relating to the timber culture act of Congress, which we reproduce as follows: The timber culture act applies to California, and an applicant under said act is obliged to swear "that the section of land specified in his application is composed exclusively of prairie lands, or other lands devoid of timber; that his filing and entry is made for the cultivation of timber, and for his own exclusive use and benefit; that he makes the application in good faith, and not for the purpose of speculation, or directly or indirectly for the use or benefit of any other person or persons; that he intends to hold and cultivate the land, and to fully comply with the provisions of this act."

The ratio of area required to be broken, planted, etc., is one-sixteenth of the land embraced in the entry. The party making an entry of 160 is required to break or plow five acres during the first year, and five acres in addition the second year. The five acres broken or plowed the first year he is required to cultivate by raising a crop or otherwise during the second year, and to plant in timber, seeds or cuttings during the third year. The five acres broken or plowed during the second year he is required to cultivate by raising a crop or otherwise during the third year, and to plant in timber seeds or cuttings during the fourth year. For less than 160 acres, the plowing, cultivation and planting is to be in proportion. On final proof, it must be shown "that not less than 2,700 trees were planted on each acre, and that at the time of making such proof there shall be growing at least 675 living and thrifty trees to each acre."

If at any time after one year from the date of entry, and prior to the issue of a patent therefor, the claimant shall fail to comply with any of the requirements of said act, then, and in that event, such entry will become liable to a contest in the manner provided in homestead cases, and upon due proof of such failure the entry will be canceled, and the land again become subject to entry by some other person. The fees on entry are $14.

Provision is made in the act for an extension in case the trees, seeds or cuttings planted should be destroyed by grasshoppers or by extreme and unusual drouth.

LUMBER AND LIME.—The great sawmills on Puget sound seem to be running this spring nearly to their full capacity, promising a large out-turn of lumber before the season is over. Lime burning is also active just now and likely to grow into a large and flourishing business on the sound. The kilns are in process of burning; two on San Juan and one on Orcas island. From one of the San Juan kilns there have already been shipped this spring over 5,000 barrels of lime, it being calculated that the season's shipments from this kiln will exceed 30,000 barrels.

MECHANICAL PROGRESS.

Wood for Clock Pendulums.

An interesting discussion recently took place at a meeting of London clock-makers on compensation pendulums. The general judgment seemed to be in favor of plain wooden pendulums for all sorts of timepieces. One speaker said that wooden pendulum rods were generally in use for turret and church clocks, and also in regulators. Another concurred in that statement, and he thought that if wooden pendulums were good for church clocks, they might usefully be adopted for bracket clocks. He had accordingly altered a very old family clock of that description, and of the best London make, by substituting a wooden for a brass pendulum, with very decided advantage. It might possibly be worth while to make a similar alteration generally; brass, being a cheaper and prettier material, having probably been used by the makers of bracket clocks without consideration. A third maker never used anything but wood when he could help it for railway, church or turret clocks. Another speaker considered that one of the advantages in the use of wood for pendulums might be that, in a fall of temperature, when the rod would be shortened, the hygroscopic property of the wood would come into play, which would tend to lengthen it, and so cause a natural compensation by the thermometric and hygroscopic properties of the wood acting in opposite directions. In some climates that certainly might be the case, though in others they would work together, when the effect would be to increase the error. It was stated that a wooden pendulum with a leaden bob had been fixed to a regulator clock in one of the leading shops, and was keeping excellent time. It was a very simple form of pendulum, and might be made very economically. Further testimony was borne to that form of pendulum. Dr. Mann had used one in Natal, which was simply a rod of varnished wood supporting a cylindrical bob of lead. It was, of course, subjected there to great and rapid changes in the atmospheric pressure and to diversities of heat, but it worked excellently for many years. Subsequently it was replaced by one of Fordeham'e best steel pendulums, and though there was some improvement, it was much slighter than might have been expected. In short, it was about as good a pendulum as could be conceived.

Elevated Railways on a New Plan.

According to the Chicago *Commercial Advertiser*, a plan is on foot in that city for the construction of an elevated railroad on a greatly improved plan. Its advantages over other systems are stated to be very great. In the first place, it is perfectly noiseless; the rattle and roar caused by the usual vibrations and echo produced by the running of trains to and from stations is obviated. Thus the inventor (a Mr. Patterson) has solved the problem which Mr. Edison was working out a year ago. It is impossible for the train to jump the track, no matter what the rate of speed may be, thereby insuring safety to passengers and the public underneath. The trucks and underwork of the car are out of sight, being inclosed by ornamental ironwork the entire length of the road. The steam brakes employed are inclosed, and disagreeable noise by the exhaust is avoided. The steam from the engine is exhausted under a casement and condensed, is not seen or heard, and is noiseless. It is also claimed by Mr. Patterson that the many objections caused by darkness of stories and streets is overcome. It does not cast a shadow as much as an ordinary awning. It is said also that the road can be built much cheaper than any now in use, is more substantial, less objectionable to property owners, and does not occupy more space on the pavement than an ordinary telegraph pole, and so arranged as to carry the telegraph wires, thereby doing away with the poles.

Adhesion of Mortar.—In building the Pont de Claix, some experimental blocks were joined by mortar which was allowed to harden for three years, when the mortar was broken by an average load of 142.228 pounds per square inch. This experiment seems to show that the adhesion of mortar to stone is only about one-third as great as the cohesion of the mortar itself. The result is noteworthy, as this adhesion is the true measure of the resistance of masonry. Further experiments of a similar kind are desirable, in order to establish formal conclusions.

Bessemer Steel Inkstands.—With the view of showing how Bessemer steel can be adapted to various purposes, Messrs. Brown, Bayley & Dixon, of the Sheffield Steel and Iron Works, have, by way of curiosity, turned out a number of inkstands manufactured from rail ends. Each of these inkstands is made from a piece of the firm's ordinary Bessemer steel rails, and is without any weld, the holder for the ink bottles, etc., being drawn out of the head, and the pen-rack forged from the flange. The inkstands are not intended for sale, not being sufficiently ornamented for that purpose.

Increase in the Demand for Bessemer Steel.—Fourteen years ago there was only one Bessemer steel establishment in the country. Now there are eleven, with an annual production of more than 500,000 tons.

Track-Laying by Machinery.

The use of labor-saving machinery in various departments of railway construction has become very general, but hitherto it has not been applied directly to the work of track-laying. A device called Moore, Coventry & Co.'s track-layer is now offered to the railway public, and has already been successfully used on the Central Pacific, Illinois Central, Chicago & Alton, and other roads. It consists of the application of a system of adjustable ways, on each side of a train of flat cars, by means of which the rails are brought forward on one side and the ties on the other, in a continuous stream, and delivered to the trackmen on the exact part of the road bed where they are to be laid. By this ingenious method the use of teams for hauling the iron and the ties is entirely dispensed with, thus doing away with a considerable portion of the expense of the ordinary method, as well as with the injury to the road bed by driving upon it. Moreover track can be laid in this way where the nature of the country would prevent the use of teams. It is claimed that by this device from 25% to 50% more track can be laid per day than without it, besides the fact that it dispenses with all the teams and with one-third the number of men usually employed. —*Railway Age.*

The intimation of the *Age* that track-laying by machinery has never hitherto been attempted, is erroneous. A machine—a California invention—for that purpose was given a practical trial in this city some 10 or 12 years ago, and if we mistake not was employed for a short time in the construction of the Central Pacific railroad.

Cupro-Manganese.—A. Raht, in a late communication to the American Chemical Society, says that as early as 1869, several French chemists pointed out that an admixture of manganese to copper, bronze and brass, tends to increase their hardness, elasticity and toughness. Since then, it appears that some parties in France have manufactured a compound styled "cupro-manganese," as a convenient form for alloying. Some cupro-manganese was imported from France into this country about a year ago. Experiments have been made with it by large brass and bronze manufacturers. All these gave, however, negative results; the metal proving more apt to tear and crack under the rolls and punching machines after an addition of this cupro-manganese. No matter how much the inferior European copper may be improved by an admixture of manganese, one can hardly expect the same action on the superior quality of Lake Superior copper. However this may be, it is evident that even inferior copper could not be improved by the addition of a metal with such impurities, as shown by the following analysis of the imported French cupro-manganese. It contains besides copper: Manganese, 16.86%; iron, 0.91; tungsten, 0.20; arsenic, 0.19; zinc, 0.18; lead, 0.14; nickel and cobalt, 0.05%; bismuth, trace; antimony, trace; phosphorus, trace.

New Dummy Car.—There has recently been completed and turned out at the railroad shops in Sacramento says the *Bee*, a new dummy car, in which the locomotive, mail, baggage and passenger compartments are combined. The car will be used on the Northern railway and will run between Woodland and Williams. It is of very neat and compact design, as ornamental in appearance as an ordinary passenger coach and will do away with the use of an engine and numerous cars which have heretofore had to be run between those places. The total length of the car is 61 feet, including the platforms. In front is a small engine with a 7x14 inch cylinder, two drivers, each 42 inches in diameter, and a coal box. Next to this is an apartment for the baggage and mail and then comes the section to be used by the passengers. Thirty persons can be comfortably seated in this apartment. Underneath the baggage compartment is the water tank and the car is provided with the Westinghouse air brakes. The work inside and out has been finely finished and presents a very neat appearance.

Life-Time of a Locomotive.—The iron horse does not last much longer than the horse of flesh and bones. The ordinary life of a locomotive is 30 years. Some of the smaller parts require renewal every six months; the boiler tubes last five years, and the crank axles six years; tires, boilers and fire-boxes from six to seven years; the side frames, axles, and other parts, 30 years. An important advantage is that a broken part can be repaired, and does not condemn the whole locomotive to the junk-shop; while when a horse breaks a leg the whole animal is only worth the flesh, fat and bones, which amounts to a very small sum in this country where horse flesh does not find its way to the butcher's shambles.

Bessemer Steel for Cutlery.—The Sheffield correspondent of the *Engineer* states that efforts are being made in the Bessemer trade to bring out special makes of Bessemer steel for cutlery purposes. These makes are now varied to any given temper. Up to this time the greatest obstacle in using Bessemer for cutlery purposes has been the variations of temper—each rod almost varying so as to cause great difficulty in the hardening. This difficulty has been overcome by the making of specialties, which are offered for even less than what is charged for rail ends, $26 in ingots, as against $45 for "cast." It is said that the Bessemer at $26 is considered equal to the "cast" at $60.

SCIENTIFIC PROGRESS.

The World's Age.

Much speculation and research has been devoted, during the last half century, to devise some reliable means for measuring, approximately, the geological periods, in order to arrive at some satisfactory idea of the age of the earth. "The Age of the World" formed the subject of a very interesting and carefully prepared paper recently contributed to the Royal Society, of London, by Mr. T. Mellard Reade, in which he assigns to our earth a period of existence greatly in excess of the limits generally assigned by physicists. Basing his estimates upon the observed rate of growth of calcareous and other sedimentary formations, the materials for which are primarily furnished by the disintegration of granitic, basaltic, and other crystalline rocks, he draws the startling inference that the elimination of the sedimentary strata must have demanded (as a minimum) at least 600,000,000 years. This period he divides as follows: 200,000,000 years for the formation of the Laurentian, Cambrian, and Silurian deposits; 200,000,000 for the Devonian, Carboniferous, and Poikilitic systems; and an equal period for the elaboration of all the other overlying rocks. These estimates do not differ greatly from those of Buckner.

Commenting upon the above, the *Scientific American* says: Limestones have been in course of formation from the earliest known geological periods, but it would appear that the later formed strata are more calcareous than the earlier, and that there has, in fact, been a gradually progressive increase of calcareous matter. The very extensive deposition of carbonate of lime over wide areas of the ocean bottom at the present day is sufficiently attested by the recent soundings of the *Challenger*. According to Mr. Reade's estimate, the sedimentary crust of the earth is at least one mile in average actual thickness, of which probably one tenth consists of calcareous matter. In seeking the origin of this calcareous matter, it is assumed that the primitive rocks of the original crust were of the nature of granitic or basaltic rocks. By the disintegration of such rocks, calcareous and other sedimentary deposits have been formed. The amount of lime salts in water which drain districts made of granites and basalts is found, by a comparison of analysis, to be on an average about 3.73 parts in 100,000 parts of water. It is further assumed that the exposed areas of igneous rocks, taking an average throughout all geological time, will bear to the exposures of sedimentary rocks a ratio of about one to nine. * * * Mr. Reade is led to believe that geological time has been enormously in excess of the limits urged by certain physicists; and that it has been ample to allow for all the changes which, on the hypothesis of evolution, have occurred in the organic world.

Prof. Tyndall on the Electric Light.—Prof. Tyndall, who was recently examined before the Parliamentary Select Committee, gave a brief history of the discovery of electricity for lighting purposes, illustrating his description by a series of experiments. Volta's discovery he said, had the power of producing heat and light, and if his conception was correct it would have been tantamount to the introduction of perpetual motion. The voltaic battery, however, was not an economical mode of producing electricity. In 1820 a Dane named Orsted found that a magnified needle was affected by the proximity of the electric current, proving the analogy existing between electricity and magnetism. Prof. Faraday had also for many years devoted his attention to the subject, with the result of discovering a new magnetic electricity. In the opinion of the witness very extensive improvements in the electric light must be regarded as inevitable, and seeing what had been done by Mr. Edison there was reason to believe that many of the existing difficulties would eventually be removed. He was afraid that as regarded public illumination, platinum would be found too expensive for general use; nor was he of opinion that the electric light would drive gas out of the field, there being so many uses for the latter.

The Nobility of Science.—And as to nobleness of character, how can one accuse science of striking at it when he sees the minds that science forms, the unselfishness, the absolute devotion to life work that she inspires and sustains? With the saints, the heroes, the great men of all ages we may fearlessly compare our men of scientific minds, given solely to the research of truth, indifferent to fortune, often proud of their poverty, smiling at the honors they are offered, as careless of flattery as of obloquy, sure of the worth of that they are doing, and happy because they possess truth. Great, I grant it, are the joys which a firm belief in things divine confers, but these the inward happiness of the wise equals, for he feels that he toils at an eternal work and belongs to the company of those of whom it is said, "Their works do follow them."—*Renan's Inaugural Address.*

An American Astronomer Honored.—Prof. Lewis Swift, of Rochester, has been elected a Fellow of the Royal Astronomical Society of England, as a token of appreciation of his astronomical discoveries.

Another new Metal.

The services the spectroscope is capable of rendering to science becomes more and more evident daily, the latest proof of the fact being the discovery of a new metal called scandium. In some of the mines in Sweden and Norway small quantities of earthy minerals are found, called gadolinite and euxenite, composed of oxides of very rare metals. The bulk of the substance is of a rose-color, arising from the presence of erbium, and is called urbine. At first it was supposed to be simply mixed with some earthy substances which rendered it impure, but not long ago M. Marignac discovered the presence of another metallic substance, which he called ytterbine, the oxide of ytterbium. However, great uncertainty existed as to the composition of these bodies, and M. Nilson undertook a series of experiments on the subject. M. Berthelot, at the late meeting of the Academy of Sciences, gave an account of what had been done so far, the result being the discovery of a new metal to which M. Nilson has given the name of scandium, to indicate that it is of Scandinavian origin. Erbine is, as before mentioned, of a brilliant rose-color, while ytterbine is white. But the separation of the two substances can only be effected with extreme difficulty. The earth has to be dissolved in boiling nitric acid, and the ytterbine then precipitated by sulphuric acid; and M. Nilson found that the operation repeated more than 20 times did not completely separate the two bodies. When he had obtained a comparatively pure ytterbine he commenced an examination of it, and then he found that it gave absorption bands in the spectrum unknown to any substance previously examined. After repeated trials he became convinced that he was dealing with a metal never before suspected, and he continued his researches. He is unable to say at present what may be the chemical properties of the new body, as the quantity of material at his disposal was insufficient to allow him to isolate the metal. Nor can he decide as yet the place the new metal is to take among the older ones, but he considers that its properties differ materially from those of erbium and ytterbium, and that it should rank between tin and thorium, as the atomic weights of these two are 118 and 234, while he calculates that of scandium at from 160 to 180.—*Galignani's Messenger.*

Telephone Exchanges.—The system of "Telephone Exchanges," one of the most useful and practical outgrowths of the introduction of the telephone, appears to be coming into very general use, and to serve an admirable purpose. At first the telephone was limited to short, private lines, each operated separately and independently. By the new system, however, a field has been opened for it of practically unlimited extent, and greatly increased utility. As some of our readers may not be aware of the features of this recent development of the telephone, we may state that it consists in the establishment of a central office, from which wires run out into the offices, stores, mills, residences, etc., of the members or subscribers. When one member desires to talk with another, the central office is notified of the fact, his wire is connected with that of his neighbor, and communication is established. By this arrangement, it is obvious that each subscriber can be put in direct communication with all the others, and the pronounced advantages of the plan will be obvious to all our readers. The *Journal of the Telegraph* comments with satisfaction on this new feature of the device, noticing among other things that the demand for the introduction of telephone exchanges, even in small places, is very urgent, and is constantly increasing as their advantages become known, and believes that they will eventually be found in every place of sufficient importance to require them.—*Engineering and Mining Journal.*

The Constitution of Meteors.—The Paris Academy, says *Nature*, has just awarded the Lalande medal to M. Stanislas Meunier for his researches into the constitution of meteors. M. Daubree had already shown that there existed a close connection between these falling bodies and the lower strata of our own globe. M. Meunier has carried the same line of research further, and proved that this analogy is not confined alone to mineralogical constitution, but that it extends to the relations which these cosmical materials, disseminated in space, present when compared amongst themselves. The academy considered that M. Meunier had reason to conclude from his experiences that all the masses once belonged to a considerable globe, like this earth, of true geological epochs, and that later it was decomposed into separate fragments, under the action of causes difficult to define exactly, but which have more than once been seen in operation in the sky itself. Such a conclusion, it is remarked, adds greatly to the interest attaching to these "minute stars." The astronomer, once occupied only with their motions and their probable distribution in space, finds himself confronted with a sideral geology, as he already was under the necessity of having regard to celestial physics, celestial chemistry and celestial mineralogy.

Dew.—The commonly-accepted theory that the phenomenon of dew is produced by the condensation of the moisture of the air by contact with surfaces of a lower temperature, is rejected by Prof. Stockbridge, of the Massachusetts Agricultural College, who defines it to be the vapor of the soil condensed by the cooler air.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 8.		Week Ending May 15.		Week Ending May 22.		Week Ending May 29.	
Alpha	19	17	17	14	23	18	23½	21½
Alta	6½	5	6¾	5⅞	8⅛	7⅛	8⅞	7⅛
Andes	40c	25c	25c	20c	50c	25c	50c	40c
Alps	....	....	....	....	....	....	....	....
Argenta	1¼	1.20	1¼	1.10	1.20	70c	1¼	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	20c	....	30c	20c
Baltimore Con	1	80c	....	....	1	50c	....	....
Belcher	6½	4½	5⅛	3⅞	6	5	6⅞	5⅛
Belmont	40c	....	40c	30c	40c	30c	45c	40c
Best & Belcher	17	14½	14⅛	12¼	19½	14⅞	20½	17½
Bullion	5¼	4½	4.30	3½	7⅛	4⅞	7⅛	6¼
Bechtel	1.10	90c	1	60c	2	1	2.70	1.60
Belle Isle	35c	....	40c	30c	60c	35c	1	65c
Bodie	9⅞	9½	9⅞	9¼	17½	12	43	21½
Benton	4.35	3½	4.40	3.40	5	4.35	5½	4.55
Bulwer	12½	11⅞	12	10¾	11⅞	10⅞	13½	11
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.15	2	1.90	1½	1.80	1.60	2⅝	1.60
Belvidere	1.10	75c	75c	55c	1	75c	2¼	90c
Booker	50c	45c	30c	20c	45c	35c	1	30c
Caledonia	1.95	1½	2	1.20	2.35	2	3	2¼
California	7¼	6⅞	7⅛	6⅞	7⅛	6⅞	7	5⅞
Challenge	2¾	2¼	2⅞	2	2.95	2.60	3	2¼
Chollar	6¼	6	5⅞	4.70	7⅞	6½	9	6⅞
Confidence	15	11	12⅜	9	14⅞	12¼	16	13⅞
Con Imperial	1.40	1.20	1¼	1.05	1.65	1.40	1.70	1.45
Con Virginia	7⅞	6⅝	7¼	6⅞	7⅞	6⅞	7	5⅞
Crown Point	5½	3.95	4.40	3.60	5½	4.60	6	5
Con Washoe	....	....	....	....	....	....	....	....
Champion	20c	10c	15c	10c	25c	20c	45c	25c
Concordia	....	....	10c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	50c	40c	55c	40c	70c	60c	60c	50c
Eureka Con	18	17½	16⅞	16	18	17½	18	17
Exchequer	5½	4.95	4⅞	3.65	8½	5⅛	8½	7½
Endowment	....	....	20c	15c	25c	20c	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.45	3.30	3½	3.20	3½	3	3.40	3.10
Gila	10c	....	10c	....	20c	15c	20c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13½	10	14	13	14	13	15	13
Goodshaw	25c	....	25c	....	40c	25c	80c	50c
Gould & Curry	9⅞	7⅞	8¼	6¼	10½	8⅞	12⅞	9⅞
Hale & Norcross	12⅝	10½	12⅛	10	15⅛	13½	18	14½
Hillside	2½	2.15	2.15	1⅞	2½	2.20	2	1.90
Highbridge	30c	25c	85c	25c	35c	25c	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	20c	....	15c	....	15c	10c
Independence	2⅞	2½	3.10	2.80	2⅞	2.60	3	2.80
Julia	3.90	3	3.40	3½	4½	3.60	4⅞	3.70
Justice	3.80	3	3¼	2½	3.85	3.15	3⅞	3.30
Jackson	6½	6½	6	....	6	....	6	5½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4.60	4	4	3.60	5	4	5½	4¼
Kossuth	....	....	....	....	10c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	70c	50c	55c	40c	70c	50c	60c	65c
Lady Wash	1.20	1	1.35	1	1.45	1¼	1.40	1¼
Leopard	1½	1¼	1.40	1.15	1.40	1	1	....
Leviathan	75c	60c	60c	50c	75c	55c	75c	70c
Leeds	75c	70c	70c	....	75c	60c	60c	70c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.55	2½	2½	2	2½	2.30	2.40	2¼
Martin White	6	5⅞	7	6⅞	....	....	6⅞	....
McClinton	1	90c	60c	60c	1	60c	1.80	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	37⅞	31	32	27	37⅞	34	43	40
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	11⅞	9	10	7½	10½	9½	10⅞	10
New York	70c	55c	60c	40c	70c	55c	65c	60c
Northern Belle	7½	7	7⅛	6⅞	7	6¼	6⅞	6
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	....	20c	10c	20c	15c	25c	15c
Occidental	....	....	75c	....	....	....	....	....
Ophir	38½	31½	36½	31½	42	35½	40	37
Oriental	....	....	50c	....	90c	50c	95c	60c
Overman	9⅞	7	8	6½	10	8⅛	11⅞	8⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	3½	....
Phil Sheridan	45c	40c	45c	40c	85c	60c	1	25c
Potosi	3.90	3.30	3½	2	4.90	3½	5½	4.60
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3½	3	3	2.60	3½	2⅞	4⅞	3
Richer	55c	....	30c	25c	60c	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11⅛	9⅞	11⅞	8½	13⅛	11½	17	12½
Seg Belcher	25	....	23	22	27	26	....	....
Sierra Nevada	52½	42½	45	40	50½	44½	54	47
Silver Hill	1.30	1⅛	2	1.30	2⅛	2.05	2½	2
Silver King	8	....	8	....	8¼	8⅛	....	....
Silver Prize	....	....	....	....	....	....	50c	....
Succor	40c	30c	50c	20c	55c	20c	90c	25c
Summit	2	1⅞	2	1	2	1½	3	1⅞
Scorpion	2.30	1.95	2.55	2	4.10	2.60	3.85	2⅞
Solid Silver	25c	20c	25c	....	15c	....	15c	5c
South Bodie	50c	35c	40c	35c	50c	35c	50c	35c
South Standard	15c	....	....	....	....	....	....	....
Star	50c	....	45c	40c	50c	....	50c	35c
St. Louis	....	....	....	....	30c	....	....	....
Syndicate	2½	2	2⅞	2.55	3½	2.90	4½	3⅞
Tioga Con	2.30	1.90	2.35	2.10	3.30	2.30	4	2.20
Tiptop	80c	75c	80c	75c	85c	75c	80c	70c
Trojan	5c	....	25c	5c	30c	20c	35c	25c
Union Con	74½	64½	69	53	77	68½	90	80
Utah	16	13	13¼	11½	19½	14	32	18¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.15	85c	1.15	50c	1.30	1	1.30	1.10
Wells-Fargo	10c	5c	....	....	5c	....	....	....
Woodville	25c	....	20c	....	....	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16⅝	13½	14½	13	19	15⅞	21⅞	17½

Sales at S. F. Stock Exchange.

Friday A. M., May 23.
120 Alpha...22@21½
100 Andes...40c
235 Alta...8@7⅞
90 Belcher...5½
465 Best & Belcher...19½@19⅞
1930 Bullion...6⅞@7
545 Benton...4.70
100 C Dorado...2¼@1.90
350 California...6⅞@6½
765 Con Virginia...6½@6⅞
100 Chollar...7
450 Crown Point...5@5¼
1110 Con Imperial...1.60@1.55
35 Confidence...14½@14¼
100 Caledonia...2.35
650 Challenge...2.90@2.80
1065 Exchequer...8½
1850 Flowery...1.05@1
355 Gould & Curry...10⅞@10½
400 Green...80c
125 Hale & Nor...15
390 Justice...3½@3⅞
530 Julia...3.90@4
100 Kentuck...5@4⅞
405 Lady Bryan...65@70c
300 Leviathan...75@70c
200 Lady Wash...1.40
140 Mount View...3½@4
760 Mexican...40@40½
550 Mackey...2.20@2.35
855 N Bonanza...2@1.80
250 New York...65c
580 North Con Vir...10½@10⅜
950 Ophir...38@37½
85 Overman...9⅞@9½
265 Phil Sheridan...80@70c
275 Potosi...4.80@4.85
100 Plutus...1
135 Savage...13½@13
300 Senator...15c
450 Sierra Nevada...50@49½
760 Silver Hill...2.40@2½
820 Scorpion...3.85@3.65
490 Succor...30@25c
100 Santiago...10c
860 Solid Silver...10@15c
125 Trojan...25@30c
600 Union Con...81@80
195 Utah...19@19½
730 Ward...1¼@1.30
270 Yellow Jacket...18⅜@18¼

AFTERNOON SESSION.
1940 Argenta...90c@1
300 Albion...30@25c
200 Aurora T...25c
300 Belmont...40c
2500 Belle Isle...70@75c
500 Bechtel...1⅞@1.60
455 Black Hawk...1⅞
30 Bulwer...11½@11
660 Belvidere...90c@1
520 Bodie...22½@21½
600 Booker...40@45c
100 Champion...25c
425 C Pacific...3.90@4
300 Caledonia (B H)...4
400 Crœsus...10c
350 Day...55@50c
100 Dudley...55c
400 Endowment...25c
1 Eureka Con...18
55 Grand Prize...3.10
150 Gila...20c
175 Goodshaw...50c
500 Giant & O A...7
300 Hillside...2
190 Hussey...10c
810 Independence...2.95@3
550 Jupiter...45@40c
800 Leopard...1
50 Leeds...80c
100 Manhattan...2.30
470 McClinton...1@1.10
610 Mono...5⅞@5⅞
100 Martin White...6⅞
100 Northern Belle...6¼@6½
100 Navajo...15c
225 Noonday...2
1100 Oriental...95@85c
485 Raymond & Ely...3
400 Summit...1⅞@1.80
1000 S Bodie...35@40c
200 Syndicate...3½@3⅞
150 S Bulwer...60c
200 Tuscarora...10c
100 Tiptop...70c
475 Tioga Con...2¾@2.90
3600 University...50@45c
1100 Vortex...70@80c

Saturday A. M., May 24.
230 Alta...7½@7¼
130 Alpha...22
620 Andes...40c
1020 Argenta...1
150 Albion...30c
420 Best & Belcher...18½@18
245 Belcher...5¼@5½
855 Bullion...6¼@6½
535 Benton...4.60@4½
2325 Belle Isle...75@70c
825 Bodie...23½@23¾
920 Bechtel...1.80@1.70
140 Black Hawk...1.70
20 Bulwer...11½
1745 Belvidere...1.05@90c
450 Booker...30@40c
800 California...6@5⅞
405 Challenge...2⅞@2.80
990 Con Virginia...5⅞@5⅞
440 Caledonia...2.40@2.30
1555 Con Imperial...1½@1.45
50 Confidence...13⅞
180 Chollar...7
280 Crown Point...5¼@5½
1500 Con Dorado...2.10@2¼
775 Champion...25c
1100 O Pacific...4@4⅞
220 Caledonia (B H)...5
350 Day...60c
250 Dudley...60c
780 Exchequer...7½@7⅝
1250 Flowery...90c@1
500 Gould & Curry...9⅞@9⅜
350 Goodshaw...65@70c
475 Giant & O A...7
345 H & Norcross...14⅞@14½
50 Hamburg...50c
300 Hussey...15c
365 Independence...2.90@3
195 Julia...3.90@3.85
295 Justice...3.65@3.55
400 Jupiter...40c
1150 L Bryan...75@70c
185 L Wash...1.30
600 Leviathan...70@75c
1085 Mexican...42@42½
750 Mackey...2.30@2.40
750 McClinton...1.10
570 Mono...5½@5⅞
75 N Con Virginia...10¼@10
40 Northern Belle...6
645 N Bonanza...2@2¼
230 Noonday...1.90@1.95
50 N Noonday...90c
870 Ophir...38½@38
800 Oriental...80@85c
50 Phil Sheridan...35c
130 Potosi...4.60
20 Raymond & E...4¼
100 Real del Monte...3
235 Savage...12½@12⅞
665 Silver Hill...2.30@2.15
405 Sierra Nevada...48½@49½
200 Succor...70@75c
1310 Scorpion...3.40@3.20
350 Solid Silver...15c
605 Summit...1.95@2
390 Syndicate...4
300 South Bodie...40c
100 S Bulwer...60c
350 Tioga...2¼@2.20
330 Union Con...90@88
300 Utah...19@18¾
890 University...60@55c
900 Vortex...75@70c
555 Ward...1.20@1.15
50 Woodville...25c
815 Yellow Jacket...18⅛@18½

Monday A. M., May 26.
175 Alpha...22@21½
250 Alta...7½
545 Andes...40c
145 Best & Belcher...16½@18⅝
735 Bullion...7@6½
550 Belcher...5⅞@5½
190 Benton...4.60@4.65
185 Confidence...14⅞@14½
275 California...5⅞@6
1960 Con Imperial...1.60@1.55
280 Crown Point...5¼@5⅜
470 Chollar...7@6⅞
915 Con Virginia...6@5⅞
70 Challenge...2⅞
100 Caledonia...2.15
1800 C Dorado...2@1.90
1090 Exchequer...8¾@8
800 Flowery...1@1.15
400 Gould & Curry...9⅞@9⅞
430 Green...90c@1
380 Hale & Nor...14⅞@14⅝
90 Justice...3.70@3⅞
435 Julia...3.95@4
10 Kentuck...4⅞
230 Lady Wash...1.30
720 Lady Bryan...75@80c
150 Leviathan...75@70c
580 Mexican...42¼@42⅞
100 Mountain View...2.90@3
550 Mackey...2.40@2.45
30 New York...60c
480 North Con Vir...10½@10⅜
860 N Bonanza...2¼@2
140 Overman...9
415 Ophir...37½@38
200 Occidental...75c
300 Phil Sheridan...70c
280 Potosi...4.90@4⅞
630 Savage...13@13⅛
100 Santiago...1¼
30 Solid Silver...10c
1010 Scorpion...2.95@3.20
505 Silver Hill...2.40@2.35
400 Succor...80@70c
380 Sierra Nevada...47⅞@47
70 Trojan...25c
265 Union Con...89@87½
70 Utah...18½@18½
500 Ward...1.15@1.20
190 Yellow Jacket...18

AFTERNOON SESSION.
250 Albion...25c
1250 Argenta...1.10@1¼
50 Aurora T...20c
1260 Booker...60@45c
1890 Belle Isle...75@65c
200 Belmont...40c
470 Bechtel...1⅞@1.95
710 Bodie...30@30½
1820 Belvidere...1.05@1.20
335 Black Hawk...1.70@1.60
240 Bulwer...11¼
500 Champion...25c
200 Crœsus...10c
90 Caledonia (B H)...5
2430 C Pacific...5½@6½
150 Day...55c
240 Dudley...50@55c
220 Eureka Con...17½@18
100 Endowment...25c
400 Fourth July...50c
30 Grand Prize...3¼
100 Gila...20@15c
200 Goodshaw...65@70c
30 Golden Terra...14
650 Giant & O A...7
300 Hussey...10c
550 Hillside...1.90@2
310 Independence...2.90@2.80
20 Jackson...5⅞@6
200 Jupiter...1@1.20
400 Leeds...75@70c
100 Manhattan...2.40
495 McClinton...1.20@1.15
865 Mono...7⅞@8
345 Northern Belle...6⅞@6
750 Navajo...20@25c
470 Noonday...2@1.95
300 N Noonday...80@85c
200 Oriental...75c
500 Orient...15c
200 Paradise...1.35@1½
60 Raymond & Ely...4½
470 Red Cloud...1@1.40
395 Syndicate...4@4½
875 Summit...2@1.90
625 S Bodie...50@40c
1150 S Bulwer...70@60c
1300 Star...45@35c
200 Tuscarora...10c
1130 Tioga Con...3.05@3
100 Tiptop...80c
2010 University...60@65c
900 Vortex...85@80c

Tuesday A. M., May 27.
685 Alpha...23@23½
130 Alta...7½@7⅛
300 Andes...40c
960 Bullion...6⅞@6⅞
450 Belcher...5⅞@5⅞
180 Best & Belcher...17⅞@17½
710 Benton...4.60@4.55
1300 C Dorado...2@1.90
465 California...6
45 Confidence...14@14½
710 Challenge...2.60@2¼
210 Caledonia...2¼@2.15
3825 Con Imperial...1.65@1.60
475 Crown Point...5
2200 Con Virginia...6
150 Chollar...7½@7½
1245 Exchequer...7⅞@7⅞
100 Fairfax...1½
785 Flowery...95c@1
100 Gould & Curry...9⅞@9⅞
495 H & Norcross...14⅞@15
515 Julia...3.80@3.70
410 Justice...3⅞@3.30
25 Kentuck...4½
2175 L Bryan...75@70c
130 Lady Wash...1½@1.30
100 Leviathan...75c
1340 Mexican...40½@41½
600 Mackey...2½@2.45
50 Mt View...2.40
530 New York...65c
195 N Bonanza...2.15@2.10
490 North Con Vir...10@10⅛
980 Ophir...37@37½
80 Overman...8⅞
800 Phil Sheridan...25@35c
265 Potosi...4.90@4.80
185 Savage...13½@13½
590 Scorpion...2⅞@2.85
500 Succor...75@65c
600 Silver Hill...2@2.20
435 Sierra Nevada...47@47½
200 Senator...20c
200 S Potosi...65c
950 Solid Silver...10c
400 Trojan...25@30c
30 Utah...18¼@18½
310 Union Con...88@86
410 Ward...1.15@1.10
795 Yellow Jacket...17½@18

AFTERNOON SESSION.
600 Albion...30@25c
1855 Argenta...1⅛@1.40
100 Belmont...40c
2880 Belle Isle...75@65c
680 Black Hawk...2.60@2.45
1060 Belvidere...1⅞@2⅞
360 Bulwer...11½
2280 Bechtel...2¼@2.10
310 Bodie...36@37½
2230 Booker...50@70c
100 Caledonia (B H)...4½
1175 Champion...30@25c
1000 C Pacific...9@9½
450 Day...55@60c
1350 Dudley...60@55c
300 Defiance...1.60
115 Eureka Con...17
800 Endowment...25c
2000 Fourth July...50c
270 Grand Prize...3⅞@3.30
75 Golden Terra...13
400 Giant & O A...7
350 Gila...20@15c
1350 Goodshaw...70@75c
100 Hillside...2
610 Independence...3@2.90
1090 Jupiter...1.10@1
100 Leopard...1
100 Leeds...75c
2760 McClinton...1¼@1.15
765 Mono...6½@8½
125 Northern Belle...6½@6⅞
300 Navajo...25c
1515 Noonday...2½@2⅞
400 N Noonday...1
150 Orient...15c
125 Oriental...65@60c
100 Phenix...3½
100 Paradise...1.35
100 Raymond & Ely...4½
300 Silver Prize...45c
200 Star...50c
820 Summit...2½@2.45
990 S Bodie...40@45c
1470 S Bulwer...70@80c
150 Syndicate...3½
800 Tioga...3.80@4
200 Tiptop...80c
1750 University...70@75c
600 Vortex...85c

Wed'sday A. M., May 28.
430 Alta...7⅞@8
50 Alpha...23
785 Andes...45@40c
680 Belcher...5½@5⅞
195 Bullion...6⅞@6⅞
460 B & Belcher...19@19½
500 Benton...4.85@4.95
300 Challenge...2.70@2⅞
400 Caledonia...2.20@2¼
1005 California...7@6⅞
830 Con Virginia...7@6⅞
590 Chollar...7⅞@7⅞
900 Con Dorado...2.30@2.35
235 Crown Point...5½@5⅛
1020 Con Imperial...1.60@1.55
560 Exchequer...7⅞@8
70 Flowery...95c@1
100 Fairfax...1½
620 Gould & Curry...11@11½
720 Hale & Nor...16@16⅞
600 Julia...4.05@4
400 Justice...3.30@3.40
95 Kentuck...4.60
20 Leviathan...70c
1095 Lady Bryan...75@70c
360 Lady Wash...1.30@1¼
130 Mexican...42⅞
60 Mt View...2
1100 Mackey...2⅞@2.70
1690 N Bonanza...2.10@2.05
520 North Con Vir...10½@10½
505 New York...60@65c
540 Ophir...39@39½
110 Overman...9½@9½
220 Phil Sheridan...75@90c
1000 Potosi...4.90@4.95
375 Sierra Nevada...50@49⅞
535 Silver Hill...2¼
605 Scorpion...2⅞@2.95
300 Succor...80c
585 Savage...14½@14⅞
1000 S Potosi...70c
140 Solid Silver...5c
2400 Trojan...30c
255 Union...87½@87
300 Utah...21@20½
500 Ward...1.15@1.20
465 Yellow Jacket...18½@19

AFTERNOON SESSION.
2500 Argenta...1¼@1.20
800 Albion...25@30c
900 Aurora T...30c
515 Bulwer...13½
235 Bodie...43@42
1440 Bechtel...2.60@2.70
1070 Belmont...40@45c
7700 Belle Isle...70c@1
1240 Black Hawk...2½@2⅞
1335 Booker...90c@1
790 Belvidere...90c@1
1150 Champion...40@45c
580 Con Pacific...6½@5½
400 Caledonia (B H)...5
1010 Day...50@60c
200 Defiance...2½
2520 Dudley...1@1.60
200 Endowment...25c
80 Eureka Con...17½@18
400 Fourth July...50c
160 Grand Prize...3.40
750 Gila...20@15c
350 Golden Terra...15
440 Giant & O A...7
440 Goodshaw...80@75c
300 Hussey...10c
80 Hillside...2
955 Independence...2.95@3
2400 Jupiter...1½@1
110 Jackson...5½@6
180 Manhattan...2¼
835 Mono...8½@9
105 Mammoth...12@11
1755 McClinton...1.80@1½
80 Northern Belle...6½@6⅞
1640 Noonday...3½@2½
1800 N Noonday...1½@1.20
580 Paradise...1.30@1.40
170 Raymond & Ely...4½@4⅞
1150 Star...50c
750 S Bodie...50@45c
200 Silver Prize...50c
1540 S Bulwer...1½@1.40
1915 Summit...2.60@3
35 Syndicate...4
200 Tiptop...80c
1085 Tioga Con...4
3200 University...70@90c
1050 Vortex...85@90c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., May 22.
480 Alta...8@7⅞
285 Alpha...22@22½
475 Andes...40@45c
205 Belcher...5⅞@5½
145 Best & Belcher...18½
1580 Bullion...7@7⅛
225 Benton...4.80@4.85
2310 Con Imperial...1.60@1.65
585 Crown Point...5½@5⅞
260 Confidence...14½@14¾
785 California...6⅞@7
140 Chollar...6⅞@6⅞
1955 Con Virginia...6⅞@7
85 Caledonia...2.35
530 Challenge...2.65@2.80
1900 Con Dorado...2.10@2¼
1489 Exchequer...7⅞@8¼
1670 Flowery...1.10@1¼
370 Gould & Curry...10@10½
220 Hale & Nor...14½@14⅞
180 Julia...4.10@4
320 Justice...3⅞
200 Kentuck...5
1230 Lady Bryan...65@70c
450 Lady Wash...1.40@1.45
370 Leviathan...75@70c
255 Mexican...37@37⅞
700 Mackey...2.10@2.20
640 New York...65@70c
555 North Con Vir...10¼@10½
685 N Bonanza...2.30@2½
950 Ophir...35½@36
210 Overman...9@9½
200 Phil Sheridan...75@85c
55 Potosi...4.70
340 Savage...12½@12⅞
130 Sierra Nevada...50@50½
200 Succor...30c
1005 Silver Hill...2.40@2½
1460 Scorpion...3.95@4.10
200 Solid Silver...15c
250 Trojan...20@25c
540 Utah...18@19½
390 Union Con...75@77
50 Woodville...25c
1200 Ward...1.30@1¼
930 Yellow Jacket...19@18½

AFTERNOON SESSION.
975 Argenta...90@95c
700 Albion...25c
400 Belmont...40c
1000 Belle Isle...60@70c
570 Bodie...20@21
315 Bechtel...1⅞@1.80
260 Bulwer...11½@11¼
300 Booker...40c
400 Black Hawk...1½
730 Belvidere...1@85c
200 Champion...25c
850 C Pacific...3.80@3½
285 Caledonia (BH)...4½@4.10
1000 Crœsus...10c
600 Dudley...60@55c
600 Day...55@60c
185 Eureka Con...17⅞@18
250 Golden Terra...14

Thursday A. M., May 29.
270 Alta...8½@8⅞
270 Alpha...23½
1145 Andes...40@50c
275 Best & Belcher...20@20½
905 Belcher...6¼@6⅞
695 Bullion...7¼@7½
765 Benton...5½@5½
710 California...6½@6⅞
1375 Crown Point...6@5⅞
245 Con Virginia...6½@6⅞
745 Chollar...9@8⅞
2385 Con Imperial...1.65@1.70
515 Confidence...15½@16
555 Caledonia...2⅞@3
925 Challenge...3@2.95
1770 C Dorado...2¼@2.60
720 Exchequer...8⅞@8½
950 Flowery...80c@1
1025 Fairfax...1½
560 Gould & Curry...12¼@12⅞
495 Hale & Nor...17⅞@18
215 Justice...3.60@3.65
1450 Julia...4½@4⅞
375 Kentuck...5@5½
50 Leviathan...75c
1280 L Bryan...65@70c
50 Lady Wash...1.35
660 Mexican...42⅞@43
200 Mt View...2@2.10
1380 Mackey...2.90@3
130 New York...60c
1700 N Bonanza...1.90@2.10
760 N Con Vir...10⅞@10⅞
710 Ophir...39½@40
285 Overman...11@11½
550 Potosi...5½@5⅛
540 Phil Sheridan...80c@1
955 Sierra Nevada...53⅞@55
790 Savage...16¼@17
140 Succor...85@90c
615 Silver Hill...2.20@2.30
1725 Scorpion...3¼@3½
200 Solid Silver...10c
1900 Trojan...30@35c
380 Union Con...86@87
845 Utah...28@32
1000 Ward...1.20@1¼
960 Yellow Jacket...20½@21⅞

AFTERNOON SESSION.
440 Aurora T...25@30c
1825 Argenta...1¼@1.15
350 Belmont...50c
2350 Belle Isle...95c@1
870 Bodie...34@35
1465 Bechtel...2@2.10
535 Bulwer...12½@13
1640 Booker...1@1.10
760 Black Hawk...2⅞
3700 Belvidere...1½@2
2845 Champion...35@45c
200 Caledonia (B H)...5
745 C Pacific...3⅞@4
910 Dudley...1.10@1¼
100 Day...50c
120 Eureka Con...18
200 Endowment...30c
1200 Fourth July...55@60c
215 Grand Prize...3.40@3½
225 Golden Terra...14
2325 Goodshaw...70@75c

250 Gila...20c
115 Grand Prize...3.15@3¼
350 Giant & O A...7
850 Goodshaw...60@45c
100 Highbridge...25c
100 Hussey...10c
385 Independence...2.90@2.95
250 Jupiter...40c
200 Leopard...1
30 Leeds...70@75c
20 Manhattan...2½
350 McClinton...1
400 Mono...5½@5½
175 Noonday...2
100 N Noonday...75c
180 Northern Belle...6½
1425 Oriental...70@90c
200 Orient...15c
345 Raymond & Ely...3
500 Star...50c
310 Summit...1.80@2
195 Syndicate...3½@3½
325 S Bulwer...55c
170 S Bodie...40c
345 Tioga Con...2.60@2½
50 Tuscarora...10c
1150 University...40c
1400 Vortex...70@75c
370 Hillside...2
100 Highbridge...30c
770 Independence...3
65 Jackson...5½@5½
1500 Jupiter...1@1.05
210 Mammoth...12@13
2170 McClinton...1.05@1¼
1610 Mono...6½@7
880 Noonday...2½@2½
400 N Noonday...1.10@1¼
300 Navajo...15c
400 Northern Belle...6⅞@7
50 Oriental...50c
100 Phenix...3
320 Paradise...1.40
200 Raymond & Ely...4⅞@5¼
100 Real del Monte...2½@2⅞
650 Red Cloud...75c
1470 Summit...2.40@2⅞
50 Syndicate...3
850 S Bulwer...1@1.10
250 Silver Prize...45c
400 Star...60c
2050 S Bodie...45@50c
100 Tiptop...75c
1420 Tioga Con...2½@2.90
3100 University...70@90c
500 Vortex...85c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Booker Con G M Co	California	2	25	Apr 28	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Belmont M Co	Nevada	20	30	Apr 4	May 10	June 2	J W Pew	310 Pine st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Caledonia S M Co	Nevada	27	50	Apr 11	May 16	June 6	R Wegener	414 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
McCrackin Con M Co	Arizona	2	50	Oct 22	Mar 3	May 31	H A Whiting	211 Sansome st
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
Trojan M Co	Nevada	10	25	Apr 9	June 2	June 23	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	6	50	Mar 29	——	June 3	C Van Dyck Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Trojan M Co	Nevada	10	25	April 9	June 2	June 23	David Wilder	328 Montgomery st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
America M Co	Nevada	1	25	May 9	June 11	June 28	R B Noyes	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	May 12	June 11	Jno Crockett	203 Bush st
Almaden Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	May 21	June 10	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Brunt	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Mayflower Grav M Co	California	4	1 00	Mar 26	——	June 5	J Morizio	328 Montgomery st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Northern Light G & S M Co	California	4	10	Apr 9	May 14	June 2	S F Monroe	419 California st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Queen Bee M Co	California	3	10	April 22	May 26	June 16	T A White	113 Leidesdorff st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Seg Europa M Co	Nevada	1	25	Apr 4	June 11	June 28	R B Noyes	240 Montgomery st
Silver Hill M Co	Nevada	6	50	Apr 7	May 13	June 3	W E Dean	203 Bush st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Sophia G M Co	California	1	02½	Apr 23	June 5	June 23	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	C S Healy	Merchants' Exchange
Twin Peak M Co	Nevada	2	15	Apr 11	May 16	June 5	T W Colburn	414 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Lady Franklin G & S M Co	California	T E Luty	330 Pine st	Annual	June 6
Lone Tree G & S M Co		Henry Cluskey	318 Pine st	Annual	June 3
Mt Jefferson M Co	California	R N Van Brunt	318 Pine st	Annual	June 3
St Luis M Co	——	W E Dean	203 Bush st	Annual	June 2
Tybo Con M Co.	Nevada	Wm M Parrish	328 Montgomery st	Annual	June 4

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

Pacific Board—Latest Sales.

Wed'sday A. M., May 28.
10 Alta...7⅞
95 Andes...50@37½c
85 Belcher...5⅞@5.45
55 Best & Belcher...19
160 Black Hawk...2.45@2½
20 Bodie...41
40 Booker...60c
70 Bullion...6⅞
405 Camero...2½@3.55
170 Chollar...7⅞
250 Con Virginia...6⅞@6⅞
60 Crown Point...5¼
105 California...7@6⅞
50 Caledonia...2.20
20 Con Imperial...1.55
175 Exchequer...8
190 Gould & Curry...10⅞@11½
70 Hale & Nor...16⅞@16⅞
140 Julia...3.90@3.95
45 Justice...3.45@3½
225 Mexican...42½@42⅞
200 N Bonanza...2¼
160 Ophir...39@39⅞
10 Overman...9½
450 Savage...14½@14⅞
50 Scorpion...2.95
80 Sierra Nevada...50@49⅞
50 Tioga Con...4
60 Utah...19⅞@20½
10 Yellow Jacket...18⅞

AFTERNOON SESSION.
200 Andes...40@45c
50 Argenta...1½
60 Alta...8
80 Black Hawk...2.45@2½
230 Bullion...7
5 Bodie...43½
50 Booker...90c
70 Belcher...5½@5⅞
10 Crown Point...5¼
20 Con Imperial...1.55
130 Con Virginia...6⅞@6⅞
30 C Pacific...5⅞
10 California...6⅞
40 Gila...15c
600 Goodshaw...75@70c
200 Geo Douglas...25c
130 Gould & Curry...11@11⅞
100 Hussey...30c
100 Julia...3.90
90 Justice...3½
20 Mono...9
670 Mackey...2⅞@2.70
100 M White...7
300 Nob Hill...75@80c
10 North Con Vir...10½
50 New York...65c
20 Ophir...39⅞
250 Paradise...1½@1.55
10 Silver Hill...2.30
10 Savage...15
20 Summit...3⅞
100 Scorpion...2.90@3
300 S Bodie...50c
600 Trojan...30c
30 Tioga...4¼
50 University...85c
10 Utah...23
110 Ward...1.15
20 Yellow Jacket...19

California Board—Latest Sales.

Wed'sday A. M., May 28.
20 Alpha...23@23½
70 Alta...7½@8
150 Andes...39c
40 Belcher...5½@5⅞
50 Best & Belcher...18⅞@18⅞
30 Bullion...6⅞@6⅞
40 California...6½@7
40 Con Virginia...6⅞@7
300 Con Imperial...1.60@1⅞
80 Chollar...7¼@7½
50 Exchequer...8½@8
300 Goodshaw...75c
90 Gould & Curry...10½@10⅞
30 Hale & Nor...15⅛
100 Leviathan...80c
130 Mexican...43@43½
450 Mono & Cross...20c
100 North Carson...30c
200 N Sierra Nevada...8c
40 Ophir...39@39½
70 Savage...14½@14½
20 Sierra Nevada...50½@50½
800 Senator...35@37½c
200 Silver Jacket...37½@50c
450 S Bodie...43@45c

450 S Utah	14c	100 Enterprise	1¦
40 Union	87@87¦	60 Exchequer	81@c¦
1000 U Flag	4c	100 Goodshaw	50c
30 Yellow Jacket	18¦@18¦	100 Glynn Dale	37¦c
AFTERNOON SESSION.		10 Gould & Curry	11¦
2300 Ætna	20@7c	40 Hale & Nor	16¦@16¦
20 Alpha	23¦@23¦	110 Julia	3.95
30 Alta	8@8¦	40 Mexican	43
100 Argenta	1¦	100 North Carson	21c
50 Belcher	5¦@5¦	1000 N Sierra Nevada	10c
130 Black Hawk	2¦	30 Opldr	39@39¦
50 Best & Belcher	18¦@18¦	300 Orient	25c
40 Bullion	7@7¦	30 Savage	14¦
50 Calfornia	7@7¦	20 S Nevada	43@43¦
90 Con Virginia	7@6¦	200 Silver Prize	40@45c
200 Con Imperial	1.60	100 S Bodie	47c
40 Chollar	7¦	30 Unfon Con	87
250 Coso Con	8c	100 Wales	1¦
10 Crown Point	8¦	40 Yellow Jacket	18¦@18¦

Mining Share Market.

From boginning to end of the week the market has been growing in streugth. This hardening has been almost general, and all aloug the line a better and increasing speculative disposition may bo seen. Tho remarkable feature of the advance is that it is extending the list of favorites to entirely new and outside quarters, The public taste seems to have thoroughly palled of the Virginia stocks, and refuses to be pleasod with anything hut Bodies. In fact, for a time, the latter seemed to have wholly oxcluded the old favorites of the Comstock from the field of speculation. Like most things relating to stock-dealing, tho reasons why "this is thus" are impossihlo of explanation. There have been no developments in the mines themselves to warrant the iuflation, and it is noticeable that the solid ore producers among the Bodies have not kept pace with the wild cats in the advance. The levers which raised them into prominenco were huge promises, and the report that Eastern investors in these stocks are becoming so excited, that a riso of unusual magnitude might certainly he expected before their demands would be satisfied. Be it as it is, the change is refreshing, and the corner-stone seems laid for a remarkably lively market. The Comstocks have recovered somewhat, but unless a marked and instantaneous change takes place in some quarter, they will he likely to he left behind in the race for the puhlic favor.

The Inter-Oceanic Canal Route.

The telegraph aunounces that the Inter-Oceanic Conferencc, which for some time past has heen in session at Paris, has decided on the Darien route for the proposed oceanic ship canal. This route is the one proposed hy Messrs. Wyse and Reclus, and it is estimated will cost ahout $210,000,000. By it a canal is to he cut through the isthmus from 80 to 90 miles in length, which shall be without locks. That is, it is proposed either to cut a hole hroad enough and high euough for the passage of the largest ships, masts, spars and all, through the Andes or to cut the Andes down eutirely, not only to the level of the sea, hut far enough below its surface to float the largest and most heavily ladeu vessels. The time necessary for the accomplishment of the undertaking has heen calculated at from 12 to 18 years, and the time of passage through it when completed for vessels will he two and a half days. There are a number of reasons for considering this scheme in an unfavorable light and at least for distrusting the motives of the parties interested. It is a generally expressed opinion that several others of the seven schemes proposed to the conference were more feasible hoth in point of expense and ease of accomplishment than the one selected, and many prominent journals openly charge that the present end was reached wholly hy the skillful engincering of Lieut. Wyse and bis adherents, who are hacked hy strong Freuch interests and have personal aims in view. Certainly the scheme appears to have heen gotten up regardless of expense, and looking at the engineering difficulties to he overcome, we fear that its motives are somewhat less than honest. Admiral Ammen, the American delegate, has throughout opposed the scheme on the ground of its impracticahility, and advocated at all times the cheaper routes lying farther to the north. Still, now that the Darien scheme has received the sanction of the conference, the whole body of American engiuers have tacitly accepted the situation. They say that the United States wants a canal, and that its location is an entirely secondary considcration, as compared with its actual construction at some one point. It is to be hoped that the canal will actually he constructed. But, taking into account the difficulties to be overcome, the enormous cost, the hampered means of obtaining the necessary funds, and the way in which the joh has been lugged through the committee, it seems much more prohahle that it will never exist, except in the floating stock, and that instead of the many millions which will be saved hy it to American commerce, we shall see our dollars quickly disappear in the pockets of these dishonest French speculators.

Bullion Shipments.

Christy Con., May 23d, $5,802; Argenta, May 26th, $11,000; Independence, May 26th, $8,000; Northern Belle, May 21st, $2,401.25; Ophir, May 21st, $15,046.86; Standard, May 23d, $37,086.92; Alexander, May 24th, $8,757.39; Hillside, from May 25th to May 28th, inclusive, $15,940; California, May 24th, $59,937.40; Silver Prize, May 24th, $2,876; Martin White, May 21st, $5,671.33; Northern Belle, May 24th, $4,753.04; Con. Virginia, May 26th, $70,141.59.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

About Plymouth.—*Ledger*, May 24: The tunnel in the north shaft of the Phœnix is progressing finely. Some very good rock is being extracted. A raise is being made from the 1200 to the 1100 levels, which, when completed, will afford ventilation for the 1200-ft tunnel. The mine and milli have been idle for a week, for want of timbers The mine resumed work on Saturday morning, and the mill will be started up as soon as there is rock to run on. The contract in the New London mine is finished. The agreement was to clear out the old shaft to the depth of 80 ft for $100, expecting to reach the bottom at that depth. But the bottom was not there. Mr. Hamilton has now given it out by the day. The old tunnel that runs into the Snake mine is being opened. It has caved in considerably near the mouth, but a couple of weeks' work will see it pretty well cleared of debris. If quartz is found at the end of the tunnel and report says it is there, and worth $14 per ton—the Pioneer company will likely get a good price for the claim from San Francisco capitalists. Not far from this tunnel stands the foundation of the old mill, which was destroyed by fire years ago. A few wooden pillars are the only relics left. Some party is in the habit of crushing and cobbing very rich ore and sulphurets obtained near this mill. Small pieces of quartz may be picked up showing free gold and sulphurets. Where did this rock come from, is a question. The Centennial mine and mill, on Dry creek, are both idle at present. Several suits are pending in the District Court against the company.

Trying to Cross the Mountains.—*Dispatch*, May 24: A party of eight men and three women are just now above Ham's station, in this county, where they have been temporarily stopped, in their effort to cross the mountains to Hope valley, whither they go (or rather wish to go) to commence work upon the Barnes mine. When they first struck deep snow they commenced to shovel a roadway for their teams; but the task soon became too much for them, so they concluded to build sleds. They hope, in this manner, to complete the trip without further material delay; but those who are best acquainted with the route, consider it rather a hazardous undertaking, and even think it impossible to make the trip before June. At the point reached with wagons the snow was six or seven ft deep; and there has been considerable snow fall during the last few days.

BUTTE.

About Concow.—*Mercury*, May 23: The mining operations on the West branch are unusually brisk this year, several companies being at work. The celebrated Bruce claim, near the mouth of East branch, has been put in working condition, and is yielding rich returns. There is a quartz mill in course of erection on the ledge known as the McConnell ledge, situated at Yankee Hill. It is to he water power, run by water from the Spring valley ditch. The mines in general about Yankee Hill have yielded fair returns this spring, owing to the wet winter. The average amount exebanged at M. H. Wells' store is from 10 to 12 ounces per week.

Mining Boat Launched.—The new boat intended to work the ground belonging to the old Henrietta mining company, was launched Tuesday. There were numerous spectators present, including Mr. Haggerty, one of the stockholders in the new company, Mr. Moreau, inventor of the machine with which the boat is to be equipped, and Mr. Klostermann, secretary of the Henrietta company. The boat is 100 ft in length by 30 wide, and weighs in its present condition 130 tons. When the machinery is put in position on the craft, the combined weight of the two will aggregate 160 tons. An engine and boiler of 125-horse power has been ordered to run the machinery with. The latter has already arrived and the former is daily expected. Tbis boat is the most substantial one yet erected for mining on Feather river. It is well built throughout, the timbers and planking being of the best Oregon pine and the frame-work is thoroughly bolted together. It is expected that the boat will be ready to begin active operations by the first of next month. The company owning the vessel have leased considerable ground from the Henrietta company, and intend making the experiment pay if such a thing be possible. That they are energetic and competent business men, the enterprise already displayed by them fully proves, and we fervently hope the gentlemen will strike the bonanza so generally believed to exist in that vicinity.

CALAVERAS.

Murphy's Camp.—*Chronicle*, May 24: Herbert & Co.'s mine, located about five miles south of Murphy's, on the Stanislaus slope, is giving a splendid account of itself. The lead is from 8 to 14 inches in width, and "chock full" of the precious metal. The company owning the mine have out a crushing of rock, which good judges estimate will pay at least $125 per ton. The rock will be crushed in Taylor's mill. The celebrated Collier mine, located in the same district, is also being energetically and profitably worked. The mine is worked through two tunnels, which have been driven in on the lead 80 and 140 ft respectively. Lead at present about 14 inches in width. Mr. Collier bas a 5-stamp mill on the mine, which is kept steadily pounding out the precious ore day and night. A recent clean-up, after a short run, yielded $1,300. The "Christmas Gift," owned by Mr. Corea, is also proving a valuable piece of property. The lead is a wide one, and the rock averages $15 a ton. Mr. Cores will have out a crushing shortly, there being now about 15 tons on the dump.

Upper Country Jots.—McBetb & Tennel, owners of a promising lead on the Nortb fork, lately crushed 17 tons of rock in Carlton's mill that paid $54 a ton. Hillery & Reed, proprietors of the Lone Star mine, are taking out rich rock and plenty of it. Messrs. Haskins and Hadley, proprietors of the well-known Champion mine, at West Point, have struck a 3-ft ledge in the 420 level. Our informant says that the rock is the richest ever taken from the mine. Porteous & Rose, owners of the "New Constitution" mine, in Soaproot gulch, are working away energetically and profitably on a two-ft vein; 150 cargoes now on the dump.

Outlook.—The mining outlook in this county at present is very flattering. There is plenty of water, and the finds in many places have proven very profitable. Prospecting companies are as thick as flies in summer.

DEL NORTE.

Resumed.—Crescent City *Courier*, May 21: Work has been resumed on the Haynes' Flat mining ditch, and the prospects are good for its speedy completion. About 50 men are already employed in executing the work.

EL DORADO.

Esperanza Mine.—*Mountain Democrat*, May 24: Our latest advices from the Esperanza mine, near Garden Valley, are to tbe effect that the new drift has been run 29 ft through the ledge, and no hanging wall yet, and it is confidently claimed that the entire 29 ft will average fully $8 per ton. This seems like a fabulous story, almost unbelievable, but it comes well authenticated and with ample corroboration. It is certain that nothing equal to this has ever before been seen in El Dorado county.

INYO.

Rex Montis.—*Independent*, May 17: We were yesterday favored with a call from George C. Potter and D. Henshaw Ward, respectively President and Secretary of the Rex Montis mining company, representing the great interests comprised in the Rex Montis, the Independence tunnel and the Shawmut consolidation. They left last evening for the mill, and will spend time enough to thoroughly inspect all the mines now working on Kearsarge mountain. They have settled all company business and satisfied all of the remaining claims against the property. Superintendent Holt has been engaged in repairing the mill, and has made it as perfect as can be without increased power, which, however, can readily be obtained at comparatively small expense, by increasing the pressure of water or putting in another wheel. A short run was made on ore from the Inyo mine, or the "Sardine company" property, now being worked by Mike Welch and others. Foreman Walker, in charge of the Rex Montis mines, will be able to show the San Francisco party some most favorable developments, made by him at the close of work last season.

MONO.

Various Mines.—*Standard*, May 24: The pumping apparatus for the Mono mine will be here in a few days. As soon as it is in position, Mr. Daly will sink his shaft 200 ft further, or to a depth of 600 ft, when he will again crosscut. This will give sufficient depth under the cap rock to render the probability of finding the ledge thoroughly mineralized much greater than on the present level. Mono's operations will hereafter be regarded with increased interest. C. A. Gould, Superintendent of the Brooklyn Con., arrived this morning and has entered upon the discharge of his duties. He informs us that hoisting machinery is now on the way, and as soon as placed in position the most vigorous prosecution of work for a deep shaft will be entered upon. The mine is in a good location, and, with proper development, will soon occupy a prominent place in the list of the paying Bodies. The winze which is being sunk from the 220 to the 320 level of the Blackhawk is now down over 50 ft. It has been in good ore all the way, and the ledge has maintained a width of from three to four ft. The north drift on the 320 level is showing a great improvement in the ledge over the point where first cut, while in the south drift it is about the same. Superintendent Ferguson expects to cut the McClinton ledge in the east and the Yosemite in the west crosscut on this level within a short time. The Mega mine is said to be improving every day, and the knowing ones declare that there is a bonanza in Bechtel. A rapid rise in both these stocks within a few days is among the probabilities. From the 1st to the 19th of May, the bullion shipments from the Bodie mines amounted to $100,455, of which $66,196 was from the Standard.

Standard.—*Standard*, May 26: Principal interest just now is centered upon the new ledge cut from the new works, and drifted on north, nearly if not quite 200 ft. It has gradually widened from 15 inches to 15 ft, and possibly more, as the hanging wall is not reached. The ore is clean and will average over $100 per ton. Crosscutting on the 700 level is progressing, with the best of indications; stringers of quartz rich in gold coming in, and the general formation favorable for a ledge at no distant day. Work is doing systematically at so many different points that it is impossible to give a detailed description in a general review of the district. It is safe to say that the mine is opened four years ahead, based on present milling facilities, and this pertains to that portion of the mine above the 400 level alone.

South Belvidere.—Work on this mine has been pushed ahead with all possible speed. At present the company is engaged in sinking a working shaft, which has reached a depth of 65 ft. A few days ago a ledge of clay and quartz was passed through. The vein is about two ft wide and prospects well in gold. The shaft will be continued down to the depth of 100 ft, when crosscutting will be commenced toward the ledge, where very important developments may be expected.

Noonday.—The north drift on the 200 level is 195 ft in length, carrying ore body as usual; winze therefrom is down 45 ft, in good ore. The east crosscut north of shaft is in 23 ft; an 18-inch vein of good ore was passed through. The west crosscut, south of shaft, is in 43 ft. The joint shaft, on the line of North Noonday, is down 83 ft. Machinery for this shaft is all on the ground, and building under way. Ore enough only to keep Miners' mill running, is being extracted.

South Belcher.—Work on the mine has progressed favorably. The south drift from the east crosscut, on the 350 level, has been advanced 10 ft, making a total length of 48 ft. The ledge is three ft wide of good ore. North drift, on same level, has been advanced 15 ft, making a total of 29 ft. The ledge in the face is still looking well, showing a vein of ore two ft wide.

Belcher.—The drift north on the Stonewall ledge is in about 60 ft, with two ft of rich ore. South drift is extended about 70 ft; ledge two and one-half ft wide, and looking well. This work on the 400 level. On the 300 level, drift south is in 160 ft; ledge three ft wide, of good ore.

NEVADA.

Mining Notes.—*Foothill Tidings:* A good clean-up of quartz from the New Rocky Bar has been made. The amount crushed was 135 loads, which yielded $35 per load, not including the sulphurets, which, according to their assay value, will run up the total yield to $40 per load. The case of the Rising Star and Eclipse mining claims vs. the B. M. Ex. mining claim, which has been pending in the Land Office at Washington for a long time on an appeal from the decision of the Sacramento Land Office, has been decided in favor of the B. M. Ex. company and the adverse claim dismissed. The Planet gravel mining company have levied an assessment of two cents per share upon the capital stock, amounting to $1,000. Now that the location of the pay channel has been definitely ascertained, the stockholders are quite buoyant over the prospects of the mine. The hydraulic mining companies will have a long season of washing, as the water supply is abundant. Ruhe Thomas is running his hydraulic diggings on the "Slide" day and night, making the most of the water while it lasts. He is using one pipe which throws about 140 inches of water. Washing has been going on steadily for three months, and a large extent of ground has been washed off. The ledge in the Live Yankee is widening out and growing richer. The Merrifield mine is an established success. The buildings, machinery and underground workings are in splendid condition. The ore body continues to improve in size and richness. Two clean-ups have been made within the past 30 days, the last of which was represented by a bar of gold worth nearly $5,000. The Smith mine, at the Half Mile House, is looking better and better every day. The ledge is getting into first-class shape, and a recent crushing of ore gave good returns. The Derbec gravel mine has started up again, with miners' wages at the old price, $3 per day. At the El Capitan mine, Gold Flat, a small force of men are now at work sinking and timbering the incline. The ledge improves with every ft it is sunk on. The Knight of Malta has elected, President, Bruce B. Lee; Secretary, Charles W. Kitts; Treasurer, David Watt; Superintendent, Charles W. Smith. The shaft is 114 ft deep, and will be pushed with all possible speed to the 200 level, when regular drifting will be commenced.

Rocky Bar Mine.—Grass Valley *Union*, May 27: The Rocky Bar mining company has purchased the engines and hoisting machinery of the Swiss-American mine, and will have them put in place over the old Chavanne shaft, for the purpose of clearing the shaft of water, and through which to hoist the rock that will be excavated from the drain tunnel that is to be connected through from the New York Hill ground. The work of retimberiug the shaft down to water level is nearly finished, there not being as many new timbers required as anticipated. The work of opening up the drain tunnel is to be pursued as fast as circumstances will permit. The ledge in the mine, at the new working shaft, is looking very well. About 60 loads of ore are now on the dump, preparatory to another crushing soon to be made at Sothern's mill. The company has levied its first assessment of 10 cents per share, amounting to $2,200, to pay for the purchase of the engines and hoisting machinery.

PLACER.

Quartz Items.—*Herald*, May 24: The 700 level of the Crater mine is turning out some very fine rock. At the hoisting works there are about 100 tons of ore on the dump. The mill, it is expected, will be started up next week. J. S. Davis has leased the Eclipse mill with the intention of running it mainly on custom rock. Shurtleff is taking some splendid rock out of his mine on Duncan hill. The Tremdlan Bros. are taking out some good ore from a ledge they are working near the old Bellevue. Pellow is also getting a fine prospect from a ledge in the same vicinity. Mrs. Kittler still has men at work on her ledge near the Crater, with good prospects. Mining men from below are coming to Auburn, or passing through Auburn, for the upper portions of our county in a perfect stream. There will doubtless be many locations made in Placer this season, and probably much money spent. It is being found out that few sections pay better on capital invested in mines than old Placer.

SIERRA.

Forest City Mines.—*Mountain Messenger*, May 24: The Bald Mountain is going on in good style, taking out plenty of gold, and hiring a large crew. The North Fork is working about 40 men, and the outlook for that unfortunate but persevering company is better than ever before. The gravel is paying about $4 to the man, which leaves a margin over expenses. They are running ahead in the quartz ledge, and are taking out good millling rock, with an occasional rich specimen, but nothing like the wonderful pocket they had when the ledge was first struck, although the rock is improving all the time. The South Fork company is not doing anything as yet, but will run farther into the hill as soon as spring opens. It is undoubtedly a good claim, or rather it is a large claim with good pocket in it. Some years ago, when the old Live Yankee tunnel was open, some of the present South Fork company ran across into the South Fork ground and got good pay. They started a new tunnel, and having lost the bed rock, sunk down and found a deep channel; but every attempt to work it has failed, owing to water. Last fall the company returned to its original purpose, and the coming summer will see South Fork numbered among the paying mines. The Bald Mountain Extension tunnel is going ahead at railroad speed, and at the present rate will be on the company's ground within a year ready to prospect. This tunnel is the farthest east, and is running directly into the huge ridge of gravel which extends for miles to the east, between the North and Middle Yuba. This ridge has never been prospected to the center in any place, and is a field well worthy of the attention of capitalists. The Oriental quartz mill is temporarily shut down for want of wood; but the mine is still being developed, with some good rock in sight.

TRINITY.

Rich Cement.—*Journal*, May 24: Fred Haas showed us some fine specimens of cement taken from his claim near Junction City, which were marvelously rich. Specks of gold are freely visible, contrasting brightly with the dark blue color of the cement. The gold is rather coarser in character than the general run of river gold, and undoubtedly found its way into the claim from Oregon gulch.

TUOLUMNE.

Mining Notes.—*Independent*, May 24: It is many years since mining has been so vigorously prosecuted in this district as is the case at the present time. The Spring Gulch mine is producing from its large vein, ore freely speckled with gold; while at the Consuello and Live Oak mines excellent ore is being taken out. The Louisiana mine is keeping the mill and two arastras fully occupied. The Confidence mill of 40 stamps, the Soulsby, the Riverside and the Evans mills are running all the time, and the milling power at the Heslep and Keltz mines is to be increased, to crush more rapidly the large bodies of ore opened out in each of these mines. A busy and prosperous season is anticipated, and good times looked for, both for the enterprising capitalist and the industrious miner.

NEVADA.

WASHOE DISTRICT.

Belcher.—Gold Hill *News*, May 23: The main incline has been sunk 31 ft on the slope below the 2700 level, and the station at that level is now being opened out. The drift south, 2560 level, has been discontinued for the present to run a crosscut east from a point 430 ft south of the incline. This crosscut is now in 20 ft, the face in quartz and porphyry, but it has not yet reached the ledge. The mine will be shut down for 24 hours to repair the V-bob at the bottom of the vertical portion of the air shaft.

Sierra Nevada.—Sinking the incline for the 2400 station. The work is all to the east of the incline, and consequently does not strike the ore body proper. The flow of water is strong, 125,000 gallons coming in every 24 hours. It is, however, readily handled since the three new pumps are in place in the east shaft, and are working well. The stopes are still being extended both south and west and are showing a broad breast of fine ore. The yield is now 65 tons per day, 25 tons more than the Mariposa mill is capable of reducing.

Justice.—The main lateral drift south, 1550 level, and west crosscut No. 1, same level, are both in quartz giving low assays. The Waller Defeat shaft is yielding 30 tons per day of first-class ore and 25 tons per day of second-class ore. Tbe stopes look well and indicate a large body of ore.

Silver Hill.—The north drift, 1100 level, is averaging about five ft per day. The workings in the southeast drift from the new shaft in the Waller Defeat ground are yielding 15 tons of good ore per day.

Uthir.—The incline is being pushed down at the rate of two ft per day, the bottom 68 ft below the 2300 station, and has during the week cut streaks of clay and veins of porphyry dipping east. The workiugs east from the 2300 station have reached a distance of 38 ft, the face still in vein porphyry showing streaks of quartz. The south drift on the 2100 level, and from the bottom of No. 1 winze, is now in 110 ft and in good ore.

Con. Virginia.—The average yield of the stopes for the past week has been 126 tons per day and $70,141.59 in bullion were shipped last Monday evening. The joint California drift west, 850 level, is making five ft per day, the face still in hard porphyry. Joint crosscut No. 1, 1850 level, is making three ft per day, through a lively-looking vein formation, giving low assays.

California.—The stopes have, during the past week, yielded an average of 180 tons per day. Total bullion shipments to date this month, $117,250.43. Joiut Con. crosscut No. 1, west. 1850 level, is in 63 ft in a fine vein formation, the quartz of which yields low assays.

Union Con.—The main south drift, 2300 level, from the Sierra Nevada incline, is making three ft per day along the east line of the ledge; total length, 165 ft. It is still encountering a lively-looking vein formation, carrying some water. The main north drift, 2000 level, is in blasting porphyry, its face 328 ft from the south line.

Con. Imperial.—The joint Alpha winze is averaging four ft per day, in increased depth, and is now down 270 ft, on the slope, below the 2400 level, the bottom in quartz and porphyry, through which considerable water seeps. The south drift to be continued on to the Crown Point for a water drain has also received its requisite attention.

Mexican.—The joint Union winze from the 1600 level is encountering a very strong flow of water, which makes sinking very slow. The bottom is besides in very hard porphyry; total depth, 420 ft, on the slope, below the 1600 level.

Gould & Curry.—The east drift, 1700 level, continues to make good progress through porphyry and clay carrying some water, its face 930 ft from the lateral drift.

Crown Point.—Still drifting north on the 2500 level along the wall of the ledge. The incline has reached the 2700 level, and the station there is being cut out.

Utah.—Three ft per day are being added to the depth of the incline, which is now 545 ft on the slope below the 1350 level. There has been a slight increase of water of late, but it is readily handled.

Hale & Norcross.—The drift east, 1640 level, has connected with the Julia branch of the Sutro tunnel. Total length, 208 ft.

Savage.—Retimbering the incline and the north lateral drift, 1600 level. The machinery at the shaft continues to receive needed attention.

North Bonanza and Flowery.—On the 300 level tbe crosscut in Flowery was found to have some 10 or 12 ft further to go to get to the ledge than was supposed. That

Continued on page 356.

New Problems in Mensuration.

[Read before the California Academy of Sciences by PROF. GEORGE DAVIDSON, April 7th, 1879.]

XVII. Given the height, h', and the diameter of the base, b', of a solid cone (Fig. XVII), to determine, in terms of the given height and diameter of bass, the consecutive heights and diameters of bases of any required number of shell cones and a central cone, having equal volume with each other, into which the given cons is to be sub-divided.

To divide the given cone into n shell cones and a central solid cone, let h' equal the height and b' the diameter of the base of the given cone; x, y, z, * * * (w—1), w, the consecutive heights, and x', y', z', * * * (w'—1), w', the consecutive diameters of the bases of the required shell cones and solid central cone; then

$$x^3 = \frac{(n-1)h'^3}{n} \quad : \quad x^3 = \frac{(n-1)b'^3}{n}$$

$$y^3 = \frac{(n-2)h'^3}{n} \quad : \quad y^3 = \frac{(n-2)b'^3}{n}$$

etc., etc., etc., etc.

$$(w-1)^3 = \frac{2h'^3}{n} \quad : \quad (w'-1)^3 = \frac{2b'^3}{n}$$

$$w^3 = \frac{h'^3}{n} \quad : \quad w'^3 = \frac{b'^3}{n}$$

XVIII. Given the heights, h, h', and the diameters of the base, b, b', of a shell cone with parallel sides (Fig. XVII) to determine, in terms of the given heights and diameters of base, the consecutive heights and diameters of base of any required number of shell cones having equal volume with each other, into which the given shell cone is to be sub-divided.

To divide the given shell cone into n similar shell cones of equal volume with each other, let h' equal the outer height, and b' the outer diameter of the base; h equal the inner height, and b the inner diameter of the base of the given cone; x, y, z, * * * (w—1), w, the consecutive heights; x', y', z', * * * (w'—1), w', the consecutive diameters of base of the required sub-divisions, both reckoned from h', b'; then

$$x^3 = \frac{h'^2}{b'^2}\left\{\frac{(n-1)\ b'^2\ h' + b^2\ h)}{n}\right\}$$

$$x'^3 = \frac{b'}{h'}\left\{\frac{(n-1)\ b'^2\ h' + b^2\ h}{n}\right\}$$

$$y^3 = \frac{h'^2}{b'^2}\left\{\frac{(n-2)\ b'^2\ h' + 2b^2\ h}{n}\right\}$$

$$y'^3 = \frac{b'}{h'}\left\{\frac{(n-2)\ b'^2\ h' + 2b^2\ h}{n}\right\}$$

etc., etc., etc., etc.

$$(w-1)^3 = \frac{h'^2}{b'^2}\left\{\frac{2b'^2\ h + (n-2)\ b^2\ h}{n}\right\}$$

$$(w'-1)^3 = \frac{b'}{h'}\left\{\frac{(2b'^2\ h' + (n-2)\ b^2\ h}{n}\right\}$$

$$w^3 = \frac{h'^2}{b'^2}\left\{\frac{b'^2\ h' + (n-1)\ b^2\ h}{n}\right\}$$

$$w'^3 = \frac{b'}{h'}\left\{\frac{b'^2\ h' + (n-1)\ b^2\ h}{n}\right\}$$

XIX. Having divided a shell cone into any number of similar shell cones having equal volume with each other, to determine in terms of the two given heights and the two diameters of the base, the consecutive heights and diameters of base of any number of similar shell cones formed inside the given shell cone, each having equal volume with the sub-divided shell cones.

Suppose the given shell cone (Fig. XIX) ie to be sub-divided into p similar shell cones of equal volume with each other; and that there are required, inside thie shell cone, n similar shell cones each having equal volume with the given sub-divisione; then let h equal the outer height, and b' equal the outer diameter of the base, and n equal the inner height, and b the inner diameter of the base of the given shell cone; and let x, y, z, * * * (w—1), w, equal the consecutive heights, and x', y', z', * * * (w'—1), w', equal the consecutive diametere of the bases of the required sub-divisions, both reckoned from h and b, then the height and diameter of base of the nth inner shell cone are

$$i_n^3 = \frac{h^2}{b^2}\left\{\frac{(n+p)\ b^2\ h - n\ b'^2\ h'}{p}\right\}$$

and

$$i_n^3 = \frac{b}{h}\left\{\frac{(n+p)\ b^2\ h - n\ b'^2\ h'}{p}\right\}$$

XX. Having divided a shell cone into any number of similar shell cones having equal volume with each other, to determine, in terms of the two given heights and the two diamctere of the base, the consecutive heights and diameters of base of any number of similar shell cones formed outside the given shell cone, each having equal volume with the sub-divided shell cone.

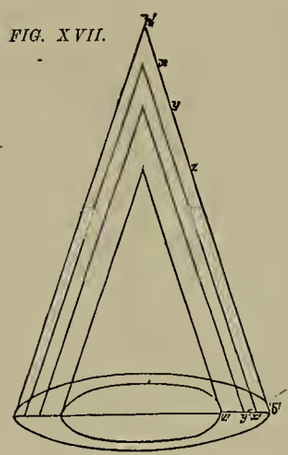
Suppose the given shell cone (Fig. XX) is sub-divided into p similar shell conee of equal volume with each other; and that there are required outside this shell cone n similar shell cones, each having equal volume with the given sub-divisions; then let h' equal the outer hsight, and b' equal the outer diameter of base, and h equal the inner height, and b the inner diameter of base of the given shell cone; and let x, y, z, * * * (w—1), w, equal the consecutive heights, and x', y', z', * * * (w'—1), w', equal the consecutive diametsrs of the bases of tbs required sub-divisions, both reckoned from h' and b', tben tbe heigbt and the diameter of the base of tbe nth outer shell cons ere,

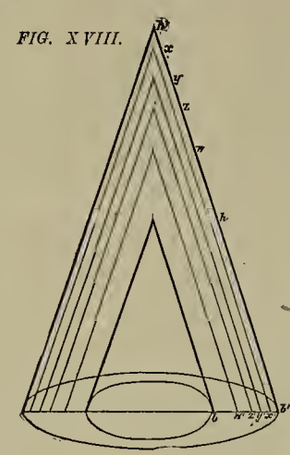
$$o_n^3 = \frac{h'^2}{b'^2}\left\{\frac{(n+p)\ b'^2\ h' - n\ b^2\ h}{p}\right\}$$

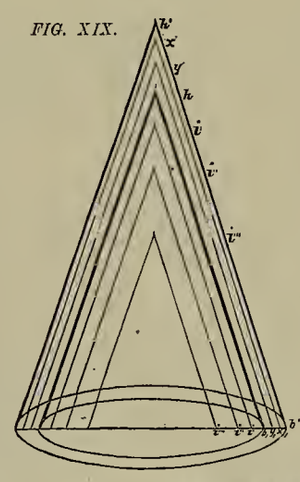
and

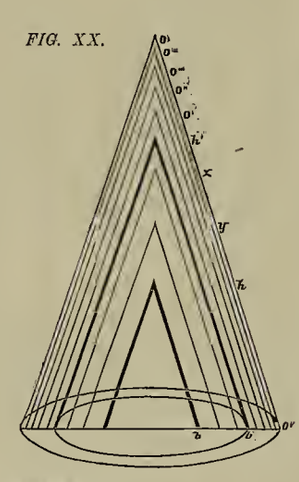
$$o_n^3 = \frac{b'}{h'}\left\{\frac{(n+p)\ b'^2\ h' - n\ b^2\ h}{p}\right\}$$

SUBTERRANEAN RIVER.—Chas. Clark, owner of the Dutchman mine in Central district, recently found some Spanish broom growing on the vergs of the desert which extsnds from Quin River valley to the Humboldt. The broom, which is a shrub that grows about tbree fest higb and is covered during the summer season with yellow flowers, is considered by miners a certain indication of water. As thsre was none of that essential fluid within eight or ten miles of the mine, Clark commenced digging a well right where the shrub grew. He and his assistant eunk about 20 feet below the surface, and one evening about quitting time they dug a hole in the center of the well and broke through a crust into what they believe to be a subterranean river, which filled tbe well almost immediately and compelled them to abandon their tools and go to the surface as speedily as possible. The water is said to be ae pure as that from mountain eprings, and wholly free from alkali. This find ie of great importance, not only to tbe miners of Central district, but to the owners of cattle which range on the plaine and hills in the vicinity.









NEW PROBLEMS IN MENSURATION.

NEW PROCESS.—Prof. Mason recently addressed the New York Bullion Club on the eubject of assaying. In the course of his lecture he explained a new process for parting gold and silver, whicb he had introduced into the assay office, and whicb had eaved the Government about $100,000 a year. In this procese sulphnric acid was used instead of nitric acid, and the silver was precipitated by the introduction of a piece of copper into the matrice. He illuetrated by actual experiment. He eaid that in the old process the chemicals were wasted, but by the new method the cost of material was nearly all saved. The gold and silver after heing assayed were pressed into cheeses, worth about $20,000 and $9,000 respectively. He said about $5,000,000 worth of gold was used annually in tbe arts.

Santa Fe's Sensation.

The Cerrillos mines, now attracting so much attention, are located in a low, isolated range of mountains about 20 miles southwesterly from Santa Fe and between 12 and 14 miles east of the Rio Grande. The Cerillos cover quite an extsnsive area of ground, the Galisteo creck ruuning along its extreme southwesterly border. The formation is granits with an occasional cropping out of sand and limestone. The minerals found are silver, copper, lead, iron and coal. Gold has not, as yet, in the Cerrillos, been found in any considerabls quantities, although extensive placer, as well as lods mines of this mineral are successfully worked a little to the south and east. Mining in the Cerrillos has been almost entirely for silver, and so far as any information of the working of the mines in ages past can be obtained, with large results.

It is well known, historically, that aftsr the conquest of New Mexico by the Spaniards, the principal business carried on by the conquerors was that of mining, and tradition tells us that their receipts in tbat line were enormous. Even the Indians were reduced to servitnde and compelled to do the mining. This they endured till ths year 1680, when a general uprising took place, and the Spaniards were driven from the country. On their return, eome years later, the Indians refused to submit to their rule except upon the conditions that the mines should not be reopened, and that they sbould never again be deprived of their personal freedom. These conditions were accepted and kept in good faith, and the consequence was that the mines remained nntouched during the wbole of the eubsequent Spanish rule. Many of tbese old mines are yet to be seen in this Territory, proof efficient, we think, not the least important of wbich are tbe present Cerrillos mines. Unfortunately for tbe obtaining of any statistical information of the working of these mines, every record that could be found at the time of the uprising was destroyed by tbe Indians, and some 20 years having elapsed before the Spaniards were enabled to again fully eetablish themselves, there is therefore no actual statistical knowledge of the workings of any single mine in the Territory, althougb it is a well-established fact that the owners in the aggregate amassed from them immensely large fortunes.

Some of these old mines at tbe Cerrillos seem not to have been touched after abandonment; others, as if for protection, were covered up, while others that are in the Territory are so carefully concealed that it requires close scrutiny to discover any traces of them.—*Santa Fe Sentinel.*

THE London *Times* says that the recent epeculation iu silver has partially if not wholly ceased.

Leadville's Gold.

No little has recently been said in the papers about tbe discovery of gold near Leadvills. The locality of "the find" was not first given, but it has now come to light that Granite, 18 miles from Leadville, in Chaffee county, is the location. This is an old gold-mining camp, and it was in one of ths old shafts that ths gold wes found. According to the Leadville papers, the mountain over which the excitement is now raging was worked for gold as far back as 1867, and $750,000 of the precious metal was teken from various shafts and tunnels, having since besn abandoned as worked out. About two weeks since a party of old gold-miners, went to Granite, and found thers an abandoned tunnel 130 feet long, tbe timbsrs end track of which wsre in an excellent state of preservation. The idea struck them of makiug an examination, and they worked but a short time when they came into the vein, dipping down the hill from where work had been stopped by the former owners, the crevice which they had been working merely pinching out at this point. Of course they were slated over this discovery, and at once started out for Leadville to have assays made and determine whether or not the tunnel had an owner. Diligent search was made, both at Granits and Fairplay, but no record was found of the property, and even if thers had been the lapse of time since eny work had been done on the property would leave it subject to relocation. This was done at oncs, and the tunnel christened the Mamis.

The *Reveille* says ths vein matter consists of one-third clay, one-third yellowish quartz, and one-third quartz largely stained with iron. The occasional fres gold is contained in the clay uext to the walls. Mr. Morse, of ths Bank of Lsadville, in person took a sack of samples of tbe averags vein matter, gave it to Prof. Fluegger of the St. Louis company, who crushed and assayed it, after which Messrs. Petrick & Bridge, Prof. Hayes, Tbercks & Co. make asseys from the sams sack. All these assays ran from 145 to 168 ounces in gold. These are facts. There is no doubt at present that there is a very extensive and paying gold region betwcen Granite and Leadville. The main reason why thess diggiugs wsre abandoned is, that they were exclusively worked for fres gold which only occurs in occasional pockets.

The same papsr makes the following commsnts: "Meu of capital, or a few strong companies who will take hold of these various claims, can make them highly remunerative by providing all of the appliances necessary to work to the best advantage, and treet their own ores by the most improved machinery for saving gold. But for the poor man, excepting the advsnturous prospector, the district is not enticing, for the very sufficient reason that mining in hard quartz is slow and expensive work, celculated to toucb the bottom of his purse before he cau open a mins to pay. This impression may be srroneous, but it is nevertheless offered for the sole purpose of warning men of small msens not to rush off to what eppears to promise a certain disappointment, founded upon the reasons just given. As there are no custom mills near the mines, ores must he hauled either to Leadville or Denver, or erected upon ths ground, and hence poor meu cannot work to the same advantage as rich. Still there is an area of two miles square in which ars strong leeds outcropping, whicb may prove rich to ths prospector willing to sell a promising discovery. Ou the other hand, so fer as our observation extended, no recent rich strikes have been made, the old claims furnishing all the free gold quertz that has been forwarded to this city for assay."—*Denver Tribune.*

The Mimbres Valley.

The Mimbres valley, from the old crossing at the town of Lower Mimbres up to San Lorenzo, is settling up rapidly. In traveling along the river one never loses sigbt of housee, and eech settler has his few acres, or larger tracts of ground, under cultivation. Much new lend has been broken this year, new buildings are in course of erection, and upon every hand may be seen the evidences of thrift and prosperity. The valley is well timbered, and is capable of sustaining a much larger population than it at present contains. At some points the width of hottom land capable of irrigation is fully equal to that of the Rio Grande.

It is estimated that nearly 3,000 acree are now under cultivation along the valley, the greater part of which is in wheat and corn. The yield is remarkable, being upwards of 30 bushels to the acre of the former cereal, and 60 bushele to the acre of the latter. Should no unforeseen accident occur, it is thought that the aggregate product of the present year will reech 15,000 fanegas of wheat, and 20,000 fanegas of corn. The valley, between the points named, is about 27 miles in length, and although the river has quite a heavy fall throughout the entire distance, the rise is so gradual as not to be perceived by a casual observer. The scenery is varied in its character and extremely beautiful; affording here and there a distant view of towering mountains, with broad stretcbes of grass-covered plain reaching down to the very river hank, and again, a picture of the shady groves and bread green acres of the valley proper, framed upon either side by abrupt foothills bearing the russet coat of a bygone season. The water of the river is clear as cryetal.—*Grant Co. (New Mexico) Herald.*

The Engineer.

Locomotive Performances.

The master mechanic of the Pittsburgh, Cincinnati & St. Louis road gives the following handsome showing, in regard to the performance of engine No. 207, built at the company's shops, and placed in service December 10th, 1874:

Up to March 3d, 1878, the engine had run 1,178 consecutive days, making an average of 122 3-10 miles per day, or a total of 144,226 miles.

	Cents.
Cost per mile for repairs	1.53
Cost per mile for fuel	4 69
Cost per mile for stores	0.67
Cost per mile for engineer and fireman	4 14
Total average cost per mile	11.24
Average number of cars drawn per mile	5.11

This was accomplished without any repairs except the current repairs attending each trip, but a change in the gauge of track made it necessary to change the gauge of the wheels, and she was taken into the shop for that purpose after making the above record. The machinery was found in good condition and entirely capable of making another 50,000 miles.

A single locomotive on the Kansas Pacific recently hauled a train of 58 empty and 15 loaded cars, with caboose attached, from Ellis to Brookville, a distance of 102 miles, in 9 hours and 30 minutes. The monster locomotive "Uncle Dick," described in a late number of this paper, has already achieved distinction by climbing the steepest grade of the mountain division of the Atchison, Topeka and Santa Fe railroad, drawing 22 loaded cars.

Real Material Triumphs.

The conquests of engineering skill over natural obstacles are actual, substantial triumphs, from which there never can be any discount.

Architecture, music, painting—all that adorn civilization—are of course well in themselves. But neither of these, or the terrible glory which ensanguines the path of the military hero, can compare in usefulness and permanence with the achievements of modern engineering.

Even a savage like Chief Joseph could comprehend this fact, and when he was asked if the capitol at Washington did not astonish him, he replied "no,"—he was "not surprised at all, for anyone could put up a big pile of stones with a woman on top." But what did fill him with unutterable amazement was to see the false-hearted white man throw a cobweb of iron over the big waters, and drive his steam wagon over it. The first of these structures that he crossed, he wrapped his head in his blanket, expecting that his last hour had come.

Even to those accustomed to such feats, the achievements of the past 30 years in railroad progress and engineering skill must seem like a brilliant, bewildering drama.—*Railway Age.*

The Importance of Straight Lines on Railroads.—The importance of securing straight lines for railroad tracks is fully shown by the expense which the Pennsylvania Railroad Company is willing to incur in straightening a short section of that road, as will be seen by the following item: On April 25th the Pennsylvania Railroad Company awarded contracts for the graduation of a straight new track, a little more than five miles in length, extending from Glenloch to Woodbine, which is intended to supersede the existing line between those points. The proposed improvement will form part of the important work, gradually progressing for some years, of straightening the eastern portion of the Philadelphia division. When completed it will avoid or save more than 300° of curvature, but will reduce the distance traversed only about one-sixth of a mile. When finished it will render useful service by enabling freight locomotives and trains to avoid the difficulties and increased expenditures that grow out of the numerous existing curves. In this connection we may remark that the Central Pacific railroad is now negotiating for the purchase of land in Oakland at a cost of many thousands of dollars to straighten a portion of their track, less than half a mile in length.

A Railroad from Europe to Central Asia and India.—The Grand Duke Nicholas of Russia has issued a pamphlet urging the speedy construction of an Orenburg-Tashkend railway. His argument for this route, based on that of De Lesseps and Cotard, is, in brief, as follows: If a grand circle be drawn of the globe between London and Calcutta, the segment of it intersected between the two cities goes through Amsterdam, then a little south of Berlin, then through Warsow, through southern Russia to the Caspian sea, which it cuts somewhat above 44° of latitude; then through the sea of Aral, proceeds to the east Samarkand, cuts the Indus about a hundred miles south of its great angle, and goes down the valley of the Ganges to Calcutta. Russia is in possession of the Asiatic part of that shortest route to India. She ought consequently to construct at once the line of railway which most closely follows it—to wit, from Orenburg to Tashkend.

Vanderbilt's Tunnel.—The work in the tunnel under the Detroit river at Gross Isle was begun April 22d, on the Canada side.

Useful Information.

To Remove Grease and Paint Spots.—The *Manufacturer and Builder* gives the following useful hints under the above head: The treatment varies according to the material; white linen can stand alkaline lyes, while cotton, especially when colored, does not stand it so well, and wool or silk not at all. To take grease spots out of linen, cotton or wool, first try soapsuds; if these do not take them out perfectly, you may use a potash or soda lye for linens; for wool it is best to use ammonia, or strong soapsuds mixed with ammonia. If the grease spots are produced by the drippings of a stearine candle, which often happens, use strong alcohol; this is also good for silk; but ordinary grease cannot be taken out with alcohol; it is necessary to use ether or benzine, and in any case to rub carefully with a clean rag, so as to remove the dissolved grease. Do not (as we have often noticed some persons do) merely pour some benzine on the grease spot and let it dry up; if you do not rub it out the whole operation is of no use. Silk requires great care, as also does paper, and it requires some experience to become an expert. One method, especially adapted for removing grease spots from light-colored silks and valuable papers, is to cover the spot with pulverized magnesia, chalk, fuller's earth, or pipe clay; lay a paper over it and then press with a hot iron; the heat will liquefy the grease and the powder will very readily absorb it. The yolk of an egg and ox bile are also recommended for silk, and soap also when used with care. In regard to varnishes, they are usually soluble either in turpentine or strong alcohol of 95°, and more easily removed than some oil paints. The most obstinate of the latter is zinc white, which, in combination with linseed oil, forms a hard white crust, which, as it resists most the above-mentioned solvents, is very difficult to dissolve out when it has penetrated into the texture, and especially when the material is woolen cloth.

Covering for Boilers, Steam Pipes, Etc.—A French firm is using a composition for covering boilers, steam pipes, and similar articles, which is certainly cheap and said to be very effectual. The surfaces are covered with sawdust mixed with flour paste. If the paste is not very liquid, the mixture being used in the form of moderately stiff dough, and the surfaces of the boilers or pipes have been well cleaned from grease, the adhesion is perfect and the material is free from cracks. Five layers of this composition are recommended, each about one-fifth of an inch thick. It is said that one inch of this composition will give better results than double that amount of the materials usually employed. The paste is composed of rough flour without the addition of starch. The mixture can be applied with a trowel, and, if there is much exposure, two or three coatings of tar will render the composition impervious to water. Copper tubes should first be treated to a hot liquid solution of clay, so as to increase the adhesion of the sawdust.

Flint Bricks.—Under the title of "Improvements in furnaces and other building blocks, retorts, crucibles, and other fire-resisting articles" a patent has recently been taken by Mr. D. Selwey, of Brigend, Glamorganshire, for bricks composed of pure flint, without the admixture of alumina or any other substance to detract from the high refractory character of the material. The inventor treats the flints in such a manner as to produce from them, when in a pulverized condition, bricks or blocks of great structural strength and durability, superior in fire-resisting properties, it is said, to the best descriptions of fire-clay goods. His patent also extends to the manufacture of artificial stone for building purposes. The material when burned resembles a fine-grained freestone, and is sufficiently hard to resist the action of the weather. It is in furnace work and similar applications, however, that these bricks are expected to be most successful.

Testing Oil by Electricity.—Among the many uses to which electricity is now put, may be mentioned the testing of oils. Prof. Palmieri, of Naples, well known for his observations in connection with the eruptions of Mount Vesuvius, has discovered that the resistance which oils offer to the passage of electricity, is in proportion to their purity. The professor has constructed an apparatus which shows, by comparison with pure olive oil as a standard, to what extent oil is adulterated, for the former is the worst conductor of electricity, while adulterated oils have a greater conductivity. The apparatus also indicates other mixtures, as, for instance, an even insignificant addition of cotton in a silk tissue.

Oil Paint.—A writer to the *English Mechanic* says: The cheapest and best solution I know of I accidentally discovered, and it may be worth while to tell how, though very likely some may know of it. In trying experiments for press-copying some old letters, amongst others I used successfully a solution of one tablespoonful of vinegar and one ounce of washing soda to a half pint of water. A little of this was spilt on the painted window-sill and in wiping it up the paint came entirely off, leaving the bare board quite clean. Try it; a gallon will not cost 50 cents.

To Blacken Zinc.—A process for chemically blackening zinc has been devised by M. Fuscher, an outline of which is published in the last number of the transactions of the Frankfort "Physisches Verein." The inventor first scours the zinc to be operated on with fine sand and very dilute hydrochloric acid, and then plunges it into a solution of equal parts of chlorate of potash and sulphate of copper in 36 parts of water. When withdrawn, after a short interval, it is found to have taken up a fine coating of velvety black, which, however, at this state very readily comes off. To insure its permanency, the zinc thus coated is quickly washed with water, allowed to dry, and then plunged into a weak solution of asphalt in benzole. The excess of this fluid is allowed to drain off, and the color can then be fixed by rubbing the sheet with a cotton plug. Zinc thus blackened is found to be particularly suitable for covering in roofing.

For Utilizing Old and Waste Rubber.—Messrs. Danckwerth and Kohler have recently patented the following procedure in Germany: The rubber waste is subjected to dry distillation in an iron vessel over a free fire, with the aid of superheated steam. The product, when thickened and vulcanized in the usual manner, is declared to possess all the good qualities of first-class natural rubber. It is recommended that the lighter oils that come over should be separated from the heavier products.

To Tin Zinc.—Make a bath of distilled water, 1 gallon; pyrophosphats of soda, 3½ ounces; and fused protochlorids of tin, ½ ounce. A thin coat of tin can be obtained by simply dipping the zinc in the bath, and one of any thickness by the aid of the battery.

Imitation Marble.—A German glass company near Fredsn, Hanover, make imitation of marble from glass, which, on account of its superior hardness, is preferable for some purposes. They imitate marble tables and floor slabs.

Good Health.

Oatmeal and Milk Diet.

Why are the Scotch people, who drink a great deal of whisky, the best developed, physically, of any of the English race?

According to Dr. Edward Smith, who carefully investigated this subject, their fine bodies are in great part the result of their diet of oatmeal and milk. The Scotch women and children do less factory work, and live more out of doors.

When the writer was in Edinburgh, the celebrated Dr. Guthrie called his attention to the size of Scotch people, and to the fact that the average size of their heads was greater than that of any other nation in the world, not excepting even the English; and when asked how he accounted for this, he replied that he thought it was owing largely to their universal devotion to oatmeal.

Indeed, the writer observed that the national dish was found upon the table at almost every meal, in the houses of the rich as well as the poor. In the morning came the mush, and in the evening the traditional cake, about the size of the crown of a hat, and a little harder than a sun-dried brick.

For further confirmation on this important question, let the writer add that he has found a great advantage to follow the daily use of (honest) brown bread and oatmeal in his family. A child whose first teeth came through in a starved condition, so that they began to decay at once and cause much suffering, is now blessed with as fine a set of second cutters as any one could ask, while the general health of all has improved. In fact, we all vote that we must daily have our brown bread and its twin-sister dish of oatmeal. —*Dr. Holbrook.*

The Pulse in Health and Disease.—Every person should know how to ascertain the state of the pulse in health; then, by comparing it with what it is when he is ailing, he may have some idea of the urgency of his case. Parents should know the healthy pulse of each child, since now and then a person is born with a peculiarly slow or fast pulse, and the very case in hand may be of such peculiarity. An infant's pulse is 140, a child of 7, about 80, and from 20 to 60 years it is 70 beats a minute, declining to 60 at fourscore. A healthful grown person beats 70 times in a minute, declining to 60 at fourscore. At 60, if the pulse exceeds 70, there is disease; the machine working itself out, there is a fever or inflammation somewhere, and the body is feeding on itself, as in consumption, when the pulse is quick.

Tobacco Smoke.—The authorities of several German cities, says *Chambers' Journal*, have been seriously considering the evils resulting from smoking, now so generally practiced by boys. In certain towns, the police have been ordered to forbid all boys under 16 to smoke in the streets, and a punishment by fine or imprisonment is meted to offenders. It has been the testimony of several eminent physicians that the too general and excessive use of tobacco is the main cause of color blindness, now occasioning such great anxiety from its influence upon railway and other accidents, and also upon military efficiency.

The Abuse of Pain.—The little nerves of feeling which run through all parts of the human body carry to the brain intelligence of disaster and of pleasure. The evil messages they bring are called pains. A pain admonishes us that some injury is done to a part of the body—a finger jammed, a toe cut, an arm burned—or that some part is overworked or is wearied out, and must have rest. The nerves but do their duty, when they report faithfully these things, and our duty is to do the best we can to repair the mischief which caused the nerves to report in the way of pain. But many persons are annoyed by these evil messages, and only seek to silence the messenger. The immediate call is for something to "still the pain." Fortunately, the means employed are sometimes such as correct the evil at once, and so put an end to the trouble reported by the nerves. Especially is this the case when cool water is applied to cuts and burns—the relief and the cure begin and go on simultaneously. This same result is usually attained when hot water applications (or fomentations) are made to bruises and sharp pains of various kinds. Pain, which results from overdoing of any kind, is most reasonably "stilled" by rest—general rest of the whole body, and especially rest of the overworked part. Anything that tends to equalize the circulation of the blood, or to make all parts of the body comfortably warm, and no warmer, helps to set the nerves at rest, or to stop pain and disease. Not long ago I saw a man who was suffering with a violent headache (a neuralgic general toothache) furiously kicking, first with one foot and then with the other, working to get the blood from his head to his heels, because he had found that the most effectual way to cure his headache. Cool applications to the head, and hot ones about the feet and legs might serve the same purpose.

Remedy for Burns.—White lead rubbed to a paste in linseed oil. Another good remedy is as follows: Take the best white glue (extra), 15 ozs.; break it into small pieces, add to it two pints cold water, and allow it to become soft. Then melt it on a water-bath, add to it two fluid ounces glycerine and six drachms carbolic acid, and continue the heat on the water-bath until a glossy, tough skin begins to form over the surface in the intervals of stirring. The mixture may be used at once, after the glue is melted and the glycerine and carbolic are added; but when time allows, it is advisable to get rid of a little more of the water, until the proper point is reached. On cooling, this mixture hardens to an elastic mass, covered with a shining parchment-like skin, and may be kept for any time. When using it, it is placed for a few minutes on the water bath until sufficiently liquid for application. (It should be quite fluid). Should it at any time require too high a heat to become fluid, this may be corrected by adding a little water. It is applied by means of a broad brush, and forms in about two minutes a shining, smooth, flexible and nearly transparent skin. It may be kept for any time, without spoiling, in delf or earthen dishes or pots turned upside down.

New Theory Concerning Fever.—A series of experiments have been made by Dr. Horatio C. Wood, Jr., of Philadelphia. The expense of the investigation is borne by the Smithsonian Institution. The experiments indicate that the rapid fall of animal temperature which takes place after section of the spinal cord, is due to paralysis of the coats of the arteries, causing their expansion; whence results an increased flow of blood to the surface of the body, and a consequent reduction of the interior heat. Fever, under this theory, is a disturbance of equilibrium between the heat-producing and the heat-cooling powers of the body. The difference of medical practice that may result from adopting the theory, can be exemplified by the treatment it suggests for sun-stroke. If the patient is in collapse, the hot bath should be applied; if thermic fever has supervened, the cold bath is required. In the first case, enveloping with a higher external temperature may save life; in the second case, cold surroundings may be similarly effective.—*N. Y. Tribune.*

Coloring Matter of Hair.—Mr. H. C. Sorby has succeeded in extracting the coloring matter from human hair. Diluted sulphuric acid he found the best solvent; he found that there are three coloring pigments—yellow, red and black—and that all the shades are produced by the mixture. In pure golden yellow hair there is only the yellow pigment; in red hair the red pigment is mixed with more or less yellow, producing the various shades of red and orange; in dark hair the black is always mixed with yellow and red, but the latter are overpowered by the black; and he found that even the blackest hair, such as that of the negro, contains as much red pigment as the very reddest hair. He concludes from this, that if in the negro the black pigment had not been developed, the hair of all negroes would not be white or yellow, but as fiery a red as the reddest hair of an Englishman.

Weak Eyes.—Bathe in soft water that is sufficiently impregnated with spirits of camphor to be discernible to the smell; a teaspoonful of spirits of camphor to a tumbler of water. For inflamed eyes use milk and camphor, adding a little more of the camphor than above.—*Herald of Health.*

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The Week.

Slowly but steadily the conviction is forced upon us that the season is advancing, and that cleaniug-up time is at haud. Lack of water will causo ths early closing down of many mines, hut altogether the run for this season has heen so prosperous and uninterrupted that few have rsason to complain. There is no diminution of activity, hut all the mines, and especially those which havs entersd ths home-stretch, seem straining every nerve and exerting every effort to keep themselves to the front and make a respectahle showing at the finish. Among the southsrn counties, Mono is hecoming sspecially activs. Bodis stocks are crsating a sensation, and it sesms as if the promised "bonanza riss" is to come through thsm instead of the Comstocks.

Inyo, through sympathy, is coming to the frout, and no doubt dcserves the attention hestowed upon it. Siskiyou has suffered in the dsstruction of one of her largest crushing mills hy firs. Butte is again indulging iu the old msthods of machins river bed working for gold, and is confident of success. From Colorado the return wave of disgusted fortune hunters dolefully chants the requiem of Leadville. The "staupeds" reaction—so familiar in California—has fairly set in, and on all sides the papers are denouncing that hsretofore prospective paradise as an unmitigated fraud. Utah plumss herself ou having attracted the attsntion of European capital, and prophesies au immediate improvsment in her mining industries. And finally, ths nsar approach of ths Sutro drain to completion has livened ths Comstocks, and givsn a hrighter and mors cheerful appsarance to the market.

Dealing with the Silver Question.

At a tims when the statis that silvsr should he permitted to occupy in the monetary system of this and other countries is so engrossing the puhlic attention, there ars a few ruling considsrations that should be kept well in view, such as the fact that the aggregate production of the royal metals is now about equal, thers heing little prospect that this relativs rats of increase will soon suffer violent disturhance—also, the fact that the value of these metals, so long as they ars to perform the function of a universal medium of exchauge, cau he affected only temporarily and to a limited extent hy local legislation—that radical laws on this subject are likely in ths end to work only mischief to the power enacting them, etc.

Last year's product of ths precious metals throughout the Far West was nearly equal, the excess of gold having amounted to less than a quartsr of a million—or, to he exact, we give the figures, gold $38,956,231, silver $38,746,391. This covers all the hullion-making territory in ths United States, British Columhia and a portion of northwestern Mexico. During the preceding two years the silver product of these countries was a trifle larger than the gold, owing to an unusually large output of the former metal hy the Bonanza mines on the Comstock lode. But this was an ahnormal stats of things and will not probahly find early repetition, at least on the Comstock range, since, even though other honanzas hs opened up, the tendency thers is to a preponderancs of gold with depth attained. What may comc of Leadville and other silver-yielding localities in Colorado will probahly he offset hy tho increased output of gold that may be expected from the Black Hills region, from the Snake River country and from the Bodie and other mining districts in Californuia. Unless the price of lead shall appreciate silver production must continue restricted iu Utah, and may even suffer some curtailment in the lead-silver producing districts of Colorado and New Mexico, as it has already done in Inyo county, California. While such is ths condition and outlook of the bi-metallic question on this coast, Australia, Africa and Siberia, the other principal gold-producing couutries of ths world, will undoubtedly go on, as heretofore, turning out that metal exclusively. In so far as Mexico and South America are concerned, thcy yield the royal metals, as a whols, in about equal quantity, and should tho business of mining in thoss countries undergo further expansion, as it probably will, this equilihrium will not be likely to suffer much disturhance.

Look where we will everything points to a maiutenance of the present nearly equal production of gold and silver, arguing the fitness of their joint retcntion as agents for effecting exchanges and measuring values. As recently, so doubtless in former times, has the monetary world heen perturhed through the discovery of new and extensive mines of gold or silver, exciting fears of a sudden and excessivs production of one or other of these metals. Such we may suppose was the effect caused hy tbe discovery of the Mexican and the South American minss, as we know it was in the case of the finding of gold iu California and Australia and of silver in Nevada. But this increass of the precious metals, while it has stimulated and expanded many interests, has had no seriously disquieting effect, financial, commercial or industrial, hsing nothing more than was required hy the growth of business and population. If it has tended to advance pricss, such advancs has heen gradual and universal, causing no jar or injury to business in general.

It is apt to hs the case, too, that the magnitude of thess discoveries is at the first overrated and their effect prematurely discounted. A great find of the precious metals excites the attention of mankind more than would the creation of a like amount of wealth by other means. The value of the gold and silver turned out hy the mines of California during the entire 30 years tbey have heen worked, is small compared with that of the cotton. the wheat, or other of the great cereal crops of ths Unitsd States. When the Comstock silver mines were discovered, the most extravagant notions of their wealth obtained and, spreading ahroad, produced uneasiness everywhere as to the effect this threatened deluge of silvsr might have upon this metal for currency purposes.

It looks now as if the hullion yield of the world promised to ahout keep pace with the expansion of its other industries; while the evenness with which gold and silver are likely to he produced suggests the wisdom of a hi-metallic policy, on our part at least. If we can induce England and all other countries to adopt a similar currency so much the hetter, as this will tend to harmouizs the silver market everywhere and croats an outlst for that metal, of which we are destined to continue the principal producers.

Thirty years ago, when gold thrsatened to largely predominats, the monometallists of that day voted for its deposition as a money metal, just as, under reversed conditions, they now advocate the demonstizatiou of silver, crcating the impression that they hslong to that class of extrsmists, who, though honest enough, ars too easily alarmed to hs safely trustad. France, with a hi-metallic currency, is to-day notoriously the most prosperous country in Europe, while England and Germany, adhering to ths gold standard alons, are suffsring such industrial depression as has caused them to seriously contemplate the restoration of silver to its old offics.

Of the much that is being said, hoth in and out of Congress, about the free coinage of silver, limited legal tendership, increasing the valus of the silver dollsr, suhsidiary currency, etc., a great deal is, no douht, inexpedient, if not visionary and mischievous. It would hs to tbe intsrest of the peopls of this coast to have silver forced into large uss irrespective of the agencies employed to effect that object. But ths desire is not general hers that recourse should hs had to other means for accomplishing that end than such as are in entirs consonance with the public good. We do not seek to have silver made a legal tendsr to an unlimited amount, nor ask for its free coinags if it is to work a henefit to us only at ths expense of other sections of ths country. Against the proposition to increass ths value of ths standard dollar from 412½ to 460 grains, we would protest as likely, if carried into effect, to soon so depreciate that metal as to deprivs it of its money function altogether. Our staudard dollar contains now more silver, proportionally, than the five-franc piece, of whicb there are in circulation at the present time over $1,000,000,000 in Europs. Compared with the silver money of ths Old World this is an honest enough coin, as it certaiuly is a very useful ons. Our hard money currency is now in a healthful and satisfactory condition, and the less tinkering done upon it the hetter.

New Method of Obtaining Metallic Copper.

In places where leaching is carried on whsre copper is obtained on a large scale iu a solution from which it has to be precipitated, it is usually dons in a large cylindrical vessel in which pieces of iron are placed. If not donc in this way the solution is placed in a vat in the bottom of which scrap iron is thrown, and thsre left until the iron precipitatcs the copper in a metallic form. In these methods, the iron has to he removed before the copper can he taken out. The copper precipitates on the irou in the tanks or cylindrical vessels, in such a manner that it is difficult to separats ths metals.

Cyrus C. Bitnsr, of Speuceville, Nevada county, has rcently patented through the MINING AND SCIENTIFIC PRESS Patent Agency a novel method and apparatus for producing metallic copper from its solutiou, to obviats thess difficultiss. It consists in the smployment of a tank or vat having a horizontal perforated diaphragm upon which is placed a quantity of irou. This tank is filled with a solution of copper previously prepared from the roasted ore in the usual manner. Through ths top of this tank a steam pipe passcs and extends helow the diaphragm, so that the solution is heated hy this injected steam, and by tbs motion which its action gives ths deposition of the copper is hardened. By means of peculiarly arranged slides the steam may bs admitted abovs the diaphragm through tubes in the steam pipes. In Mr. Bitner's process the chemical action is the same as formerly, but the details of construction of ths tank and operation of the steam, are such as to facilitate the work.

The copper solution is drawn into an ohlong tank which is provided with a cover, and strengthened hy supports aud tie rods. Extending entirely across this tank, a short distance ahove the bottom, is a wooden grating or perforated diaphragm. In the center of the tank is a square npright wooden tube, the hottom of which is closed. Perforations are made at diffsrent points in ths tubs, aud steam is injected on the top of said tuhe which may pass out of any of the perforations which may he open. The lower pcrforations are under the horizontal grating, and the steam ordinarily passes out of these openings, but when it is desired to allow steam to come out ahove the grating, ths operator has it under control. This control is sffscted hy slides fitting in dovetail joints formed hy the corner pieces. These slides have ruhher faces and may he slid up or down as the opsrator desires. As they ars slid up the tuhes are opened at any desired point, and the pressure of steam cannot press them out.

The scrap iron is thrown down on the perforated diaphragm or grating and the solution admitted to the tank. The iron precipitates the coppsr in ths solution, which action is facilitated hy the heat furnished hy the steam. As the copper precipitates some of it falls to ths hottom of the tank and some of it on the iron or on the grating in the upper chamher. After the solution has heen drained off, hy running the slides up and allowing the steam to escaps from higher orifices, the steam blows or washes the precipitated copper from the iron and throws it to the hottom of the tank.

Ths precipitated copper may he washed out of the tauk through a suitable openiug, which is usually tightly closed on ths outside by a plug and wedgs.

By this means the copper is precipitated from a solutiou, and it may he removed from the tank without rsmoving ths iron, said iron heing cleansed hy the steam. Steam may he turnsd off at any moment during ths precipitation if desired. The steam will agitate the solution in such a manner that the precipitated copper will he washed rapidly from the iron and fall through the grating to the bottom. Mr. Bitner says he can precipitats a tauk full in thrse hours. Cost of constructing apparatus ahout $75.

The Unemployed and the Mines.

Ths city continues to swarm with men wholly out of work, hesides many who are but partially smployed and poorly paid. Having waited through the winter and spring, holding on in hopes of a change for ths hetter, the summer approaches without hringing these men more labor or improving their prospects. It hecomes, indeed, every day more and mors evident that if they are to get work or find places where they can earn stesdy and even the smallest wages, they will have to seek them elsewhers than in the city, the mines affording thsm perhaps ths best openings for doing so. We say this, not that ths mines present now anything very enticing to men in search of essy situations or mors than moderately good wages. Thers is in the mines at ths present day only low prices with small averags sarnings. To find there now paying claims open to location is no easy matter. Still, there is not in the mining districts the ssme destitution, over-crowding snd utter impossihility of getting a day's work and earning an honest living as in the city. Besides, once out in the country, men are not so apt to fall into loose habits or have recourse to disreputahle shifts for getting along.

In leaving the city for the mines it is not hest as a general thing for men to go without soms previous preparation, nor should they go wholly alone, especially whsre they have had little or no expsrience in this sort of life. We pointed out a week or two since such sections of the mining regions as sesmed to afford the hest openings for men seeking employment or for opportunities to employ themselves, suggesting also a plan of proceedure that if adopted would he likely to facilitsts their labors and tend to insurs for their undsrtakings a mors complete success.

That plan was for lahorers and parties of small means, heing out of employment, or who, for other reasons, might wish to go to the mines or hecome interestsd in the business of mining, to combine their means, and forming themselves into small companies, send out into the minss two or three of their number to hunt up and sslect there the hest locality they could find for a small party to engago in mining, looking out at ths same time for any chances they might see or hear of for meu to get employment on wages. For this scrvice the men hest fittsd hy experience and other qualifications, would, of courss, he selected. Generally speaking, California opens the bcst field for working men or others possessed of hut small means to engage in mining, hecause here ths mines can bs reached at least expense, while ths climate is healthisr, living cbeaper, and the facilities for starting and carrying on the business hetter than elsewhere. Then mining here takes on a greatsr variety of forms than in any other part of the country. We have iu this State a great extsnt of placer diggings, some of which require to he worked hy drifting, and others by the sluice or hydraulic process. There are here river heds to he laid hare and washed with great quantities of tailings that can he profitahly rehandled, ths gold-hearing quartz veins ahounding from one end of ths State to the other. Ths tailing deposits that would pay for re-washing are found in greatest quantity in the tier of counties reaching from El Dorado to Plumas. Tuolumne, Calaveras and Amador afford good chances for engaging in quartz mining in a small way; though Siskiyou presents perhaps the hest opening for this business, ths disadvantages heing that it lies a good way off, and can bs reached only hy long wagon transportations over a high range of mountains. Still, it is a good county to go to, hsing well supplied with wood and water, and possessing other mineral resources hesides its quartz veins.

Parties having some considerahls moncy might repair to the Snake river region with fair chance of doing well; hut it is sxpensive getting there, while it will cost at least $1,000 to inaugurate a successful mining operation on that stream. Mono county is full of good lode mines, hut it takes money to open them, and ws fear the chances for a poor man there would he nons of ths hest.

For washing ths tailings so plentiful in ths mors central mining counties, very little mouey for outfit is required, this husiness being prosecuted hy means of sluices and sometimes with only the old-fashioned rocker, with which implemsnt the Chinese manage often to make good wagcs. It is also possible to start a quartz mining opsration with very little capital, the arastra heing in this case used at first. There is no troubls in finding quartz almost anywhere along the main gold helt of California that will pay five or six dollars to the ton. With two arastras that can he huilt for $50, and a horse or mule to drive each machine, three men can take out and crush four tons of ore daily. The entire cost of an establishment of this kind, tools, cabin, etc., included, need not exceed $200 or $300, whils the daily net profit of running it would average $15 at least. Thousands and tens of thousands of industrious, temperats, frugal men, could in this manner maks small, hut sure and steady wages in the gold fields of this State, and while doing this they could get hold of valuable mining properties, secure a pisce of land, make homes, and live a healthful, free and independent life. If only this class of men will take to the mines, observing some such method of procedure as here suggested, they will in the end have ahundant reason to he satisfied, and will in most cases bs themselves surprised at thsir own success.

Operations of the Signal Service Bureau on the Pacific Coast.

"Old Probabilities" very quietly made an extended reconnoissance of the Pacific coast a short time ago, unknown in his modest incognito to almost every body. This happened in part at least from the fact that the old gentleman is a complicated personage. It is impossible for one man—the able chief of the Signal Service, General Myer—to attend to the entire direction of the Bureau, and at the same time to all the details of studying and making out, plotting and publishing the weather likelihoods for so large an area of the earth's surface as is covered by the United States. In the general office at Washington there are several other persons whose special duty it is to take the collated data, and deduce therefrom the probabilities, dividing the work between them.

One of these persons is Lieut. Robert Craig. Thoroughly familiarized with the air currents, cloude and storms, they have a romantic existence, dwelling in a higher sphere [or place then ordinary plodding mortals. Their minds and souls are always traveling upon the whirlwind. They rest npon the clouds; they are unceasingly sliding from one stratum of the atmosphere to another, mounting to the loftiest hights of the "cerulean blue," and delighting above all things in the surprisee which they are able to create among the busy populations, unable to look beyond their own horizon. If they can hurl upon us (as ie their daily wont), an unexpected storm of wind or rain, it is to them a delectation.

Worn and wearied finally by this kind of life, followed for many years without respite, Lieut. Craig last fall obtained leave of absence, and recuperated his bodily energies among the nooke that furnish congenial surroundings for such a spirit, on the Pacific coast, along which in the course of three or four months he waudered from Lower California to British Columbia. Naturally enough the epirit of Old Probabilities made its presence known as flitting over this region to him who toils on the PRESS. Our interview—or sesnce if the reader likes—took place at the Baldwin hotel in March last. Lieut. Craig returned a few days later to Washington, where, remounting the tripod, he has since been flourishing the scepter of Jove in the shape of a crow quill over his weather maps.

Before the Signal Service Bureau was organized this gentleman observed to us, that very little was known of these areas of low and high pressure on an extensive scale. They had never made any simultaneous observations. Espy made some deductions, but he drew simply a straight line—a tremendous trough representing low pressure. But he did not have the data to work upon. Considering what he had, he accomplished all that could be expected.

The Signal Service observations are now taken three times a day all over the country at the same moment. The observation at 7:35 A. M., Washington time, is taken simultaneously all around the world. In remote outside regions where there is no telegraphic communication the results are transmitted by mail, and used in the course of the year in a more general way and with good effect. The results of a general character are published from time to time; and the more special daily, in the printing office of the Signal Service Bureau. Every month the Bureau prepares and publishes a monthly review of the United States, wherein are charts, giving the directions of storm centers.

Every storm that crosses our country is noted, with a short description and charts. These reports are familiar to many of our readers. They come out about the middle of each month and may be seen at all the regular and volunteer signal offices on the coast, as well as at other places where they have been desired and arranged for. There are 400 or 500 volunteer observers in the United States. In return for their services these reports are sent to all observers.

On the Pacific coast the extension of the service beyond the confines of California is new. The probabilities for the coast have not been daily studied and published until the past year, when regular offices were established as far north as Olympia, W. T. As both the regular and volunteer offices have been constantly multiplying since, we are unable to furnish a complete list. Many thousand square miles, however, of the Cordilleran plateau and Rocky mountain country are not yet represented.

The mountain ranges have not such a decided influence on high and low pressure centers governing the movements of storms, as would be imagined; in fact, very little, though they have great influence on the storm itself, after it has been created. The high mountain ranges simply take out all the moisture, which is the fuel of the storm, and keeps it going. As a storm approaches the Sierra Nevada, for example, the rising of the atmospheric stratum into a colder hight, causes deposition in the form of rain or snow. Mountains and valleys have a good deal to do in shaping the direction of the winds of the lower atmosphere, being those with which we are acquainted. Rain storms once generated and moving in any direction close to the surface, are subject to deflections just like the winds without rain.

It so happens that the winds blowing into the Golden Gate agree in direction with the course of the general atmospheric current in this latitude. No sooner do they reach the interior valleys than their courses are altered from the northwest to southeast. Storms generally move from west to east in the latitude of the United States, between 25° and 75° north of the equator. The storm centers which affect the North Pacific coast strike the same approaching from the west, at all points between the parallels mentioned. The rain storms are just as likely as not to strike the coast south of San Francisco, though the majority strike it to the north of that point. Some of the California rain storms come here from Oregon and Washington. What proportion originates north of the Columbia, observations have not been made to show.

The southerly winds of winter are produced by a depression—a low barometer—north of us, while it is high to the southward. The rains, where they occur on the coast in summer time, have the same general direction of movement as those in the winter. The directions of the wind preceding rain may vary according to the season. When, for example, the wind here is from the south people say they are certain to have rain.

THE REGION OF THE THOUSAND WELLS, ECHO CLIFFS, ARIZONA.

What brings the rain storms down the coast is not always clear. Sometimes the Signal Bureau observers can see certain indications of causes to make them so move while at others they find it impossible to explain why they should take that particular direction. The Oregon rain storms frequently take this course nearly to the southeast, instead of the normal course directly to the east. Sometimes there is in advance of the normal movement, eastward beyond the Rocky mountains, an area of high pressure which would cause them to turn southeastward.

There are three different storm belts. From the equator to latitude 25° or 30° north, storms move from the southeast to the northwest. In our latitude they move from west to east. North of us, somewhere in the neighborhood of 65° or 70°, they begin to move from the northeast to the southwest again. These belts shift up and down a little according to the season. Loomis's Meteorology states the phenomena and their causes. He gives these as the prevailing currents all over the globe. Generally speaking, the normal direction of the belt current rules the direction of the storm movement; but the low pressure areas or storm centers are still more strictly governing as to details, while following themselves the movement of the prevailing winds. Our north winds are sometimes winds which follow a storm as it passes away. At other times they are winds preceding what is called a high barometer.

In our next issue we will take more particular notice of the movements of storm centers common to the regions along the Pacific coast, with those of the plateau of the Rocky mountains and beyond; the philosophy of the dry season on the Pacific coast; the nature of the precipitation in the desert regions of the plateau; exceptional instances; and of the increase of rainfall in certain parts since 1849, etc.

THE proprietor of the Pullman car invention reports that paper wheels have run 400,000 miles under his cars without repair, while the average running power of an ordinary wheel is from 55,000 to 60,000 miles.

The Thousand Wells.

Our engraving gives a glimpse of a very interesting region on the Colorado river in northern Arizona. It is, as may be seen, a wild region, the surface being deeply furrowed or eroded, as the geologists say, and shows the work of great grinding and wearing agencies in the years agone. This piece of landscape includes a few of many remarkable natural formations known as the "thousand wells." They are located on the western slope of the Echo cliffs. Powell says this slope is composed of homogeneous but rather friable sandstone, and the rain-water rills have corroded deep channels, interrupted by many pot holes. After a shower these pot holes are found filled with water. There is a place near by the trail which passes from the mouth of Paria to the province of Tusayan where there is a collection of these water-pockets, known as the thousand wells. These wells are used by the Indians as water sources during their wanderings, but the chosen abode of the Indians is on the eastern slope of Echo cliffs, where numerous springs are found which are their famous watering places.

MAKING SILVER.—Once more the old delusion or deception that gold and silver can be made by compounding other substances, has been revived and palmed upon the public. This time the alchemist is a Dr. Thomas Farriss, of Mt. Pleasant, Ohio, who alleges that he discovered his secret while at college. He noticed that certain waste washings in the laboratory had accidentally precipitated a metallic substance, which, on examination, he found to be silver. For a number of years since, he has been experimenting to produce this same substance. He now claims to have succeeded, and is manufacturing silver on a small scale for the benefit of his friends. The materials and process used by him, are, of course, kept in profound secret. Without doubt they will remain so—such things generally do. He succeeds well with his assistants, and yet they are reported to be utterly ignorant of chemistry. This fact is calculated to attract and impress the ignorant, but to the scientific observer it savors strongly of charlatanry. If his assistants were experts, the Doctor would not be able to use lunar caustic, or the so-called horn silver or any other such compound, from which it is easy to make silver. It is undoubtedly the same old story told again.

YOUSE'S IMPROVED PISTON PACKING.

THE MECHANICS' FAIR.—The coming Mechanics' fair promises to be an improvement on any heretofore held. Applications for space by future exhibitors are more numerous than ever before so early in the season. There are new features under consideration, which, if carried out, will add greatly to the attraction of the coming fair. In view of the increased requirements of future exhibitors, an addition is being made to the pavilion at the end toward Mission street. The interior arrangements of the pavilion generally, are also to be changed—even to the music stand and the fountain. The machine space will also be enlarged in expectation of larger exhibits of mining and other machinery.

An Improved Piston Packing.

We illustrate herewith an improved piston packing, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Samuel A. Youse, of Sutter Creek, Amador county. The improvement is in that class of engine packings in which the packing is effected by the action of steam under pressure, which is allowed to enter the interior of the piston at each stroke and thus force the rings out to a bearing. It consists in a novel combination and arrangement of a series of three part external expansible rings, upon an interior externally flanged body, which is in turn supported upon or surrounds the spider. This body has circular grooves surrounding it centrally beneath each broad ring, and these grooves receive steam through passages from each end of the cylinder, so that the rings upon that side of the central flange only will be expanded by the action of the steam during the portion of the stroke upon that end of the cylinder. A peculiar spring is employed at the bottom of the piston when moving horizontally, whereby the piston head and follower are prevented from falling upon the side of the cylinder when running without steam, and thus wearing it out of true.

A is the piston head, *B* the spider, and *C* the body of the piston which is provided with a central flange, *D*. The rings are composed of three parts each; a broad ring which fits the body of the piston, and two outer rings, *G*, which are fitted upon the outside of this inner ring. Each of these rings is made in a single piece with one cut, so as to make them elastic. The body, *C*, of the piston has grooves, *H*, turned upon each side of the central flange, *D*. These grooves lie beneath the center of the rings, *H*. Inner rings and holes, *I*, are drilled so that the grooves, *H*, will connect with similar grooves, *J*, which are formed on the edges of the part, *C*. When the follower is in position these grooves, *J*, will lie against the head, *A*, and follower respectively. Holes through the head and follower admit steam to the grooves, *J*, and from these, holes, *I*, admit it to the grooves, *H*, in the face of the body, *C*. The ends where the rings are cut are made to break joints so as not to leak steam, and as the inner ring has its center over the groove, *H*, the pressure will be central and there will be no side pressure by reason of the steam being admitted beneath one side or the other of the rings. Before admitted centrally it will be distributed equally outward from the groove, which is of advantage in steadying the rings and equalizing the pressure.

The flange, *D*, fills the cylinder like the piston head and follower, and the rings are thus held in place, one set upon each side of this flange. In the drawing one set is shown in place and the other set removed to show the head. Steam being admitted to the cylinder it will enter the small holes upon that side of the piston, and passing through the channel, *J*, will enter the holes, *I*, and grooves, *H*, thus expanding the rings upon that side of the flange, while the rings upon the opposite side will remain loose. The reverse action takes place upon the return of the piston. The interior rings have each a pin projecting from them, and the double outer rings have corresponding grooves which fit the pin, preventing the rings from changing their positions.

In order to support the weight of the piston and prevent its dropping on the side of the cylinder, where it will wear the cylinder out of true when running without steam, as in locomotives, going down hill, a single adjustable spring is fitted within the spider, as shown, and it serves to keep the piston head and follower up by its elastic ends resting upon the body, *C*.

By this construction the inventor is enabled to simplify the steam packing. It economizes the steam employed by means of the grooves, producing a pressure outwardly from the center of the rings, which equalizes the pressure and the wear. An improved compound ring is provided, and the wear of the piston and cylinder is reduced to a minimum. The device is simple in construction and operation.

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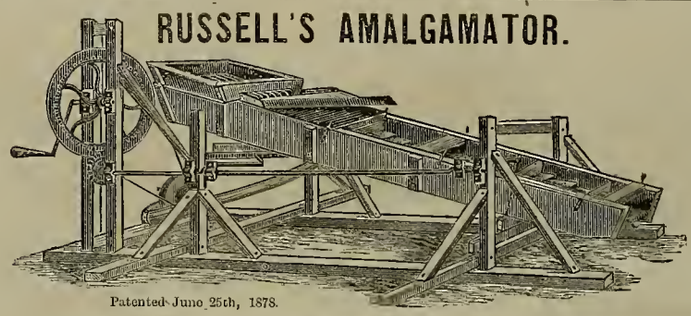

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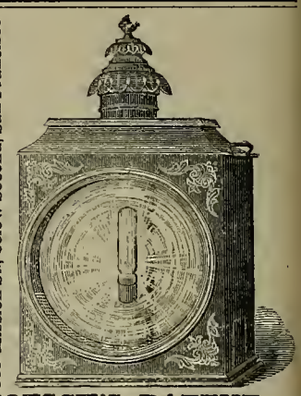

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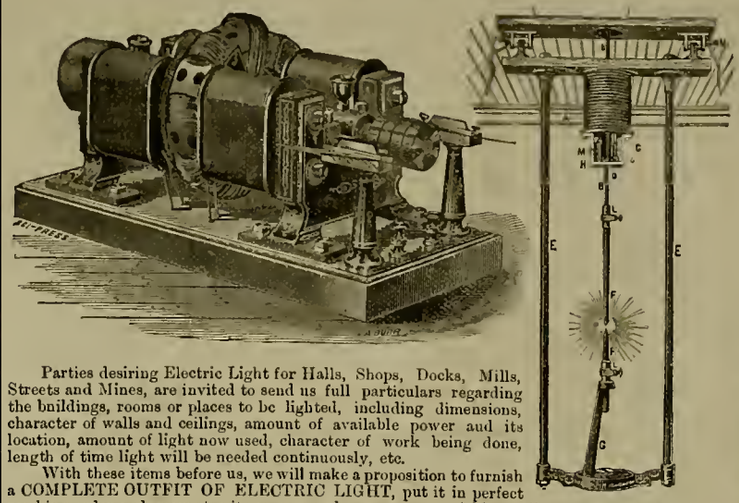

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Forty Tons of Ore in Twenty-four Hours,

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Dewey & Co {202 San-some St.} **Patent Ag'ts**

Continued from page 349.

in North Bonanza grouod was nearer the ledge than was supposed, so that some ore has been disclosed in it.

North Con. Virginia.—Sinking is making about two ft per day during the time that the work of putting in new guides and fitting the shaft for use of skeets is going on. The bottom is 72 ft below the 1700 level.

Alta.—Running both north and south from the station on the 1750 level at the bottom of the joint Benton incline winze, preparatory to crosscuttiog oo that level.

ESMERALDA DISTRICT.

A General Prospecting Shaft.—*Herald*, May 24: The committee appointed by the citizens oo the 2d of this month to examine the various locations in this mining district, and to report and recommend the most suitable place to sink a shaft, request us to state that they have secured the best piece of ground in this section, and also that every arrangement is nearly completed to the early carryiog out of the proposed project. We expect soon to be able to give tho full particulars in regard to the exact location of the ground selected, and all other desired information in connection with the movement.

EUREKA DISTRICT.

Eureka Con.—*Sentinel*, May 25: The following work has been done in the several levels: 5th, the east drift has been continued 28 ft, and is now in 114 ft; 7th level, the northwest drift has been continued 50 ft, and is now in 100 ft; 11th, the west drift has been continued 45 ft from the ore chamber; 13th, the east drift has been continued 19 ft, and is now in 77 ft. The west drift has been continued 10 ft, and is now in 30 ft. The incline has been sunk 21 ft, and is now down 405 ft below the station.

Hamburo.—West crosscut, 600 level, has beeo advanced 12 ft, making a total of 312 ft. The rock in the face is considerably harder than usual, but blasts well. East crosscut, 600 level, is now in 54 ft. The cross vein followed is now running nearly southeast, which they hope will soon lead to the main north and south vein. They have shipped to the Richmond furnaces, duriug the week, 57 tons of first-class ore. Have found some very rich ore near the old Hamburg shaft, about 20 ft from the surface, which gives every indication of opening into a considerable body.

Fourth of July.—The north drift from ths cave above ths lower tunnel level bas been advanced 22 ft, following the vein which shows a large mass of iron, low-grade ore and about two ft of extra good orc in the footwall of the vein.

GOOD HOPE DISTRICT.

Jottings.—*Silver State*, May 25: The mines here are looking well. The ledge in the Aurora has widened out considerably of late and the prospect for a paying mine is more flattering than ever. From the U. & I. mine some exceedingly rich ruby ore is being extracted, exceeding in value the samples recently tested in Salt Lake City. Work in the Buckeye progresses slowly, the rock becoming harder as the drift is advanced. A rich ledge was recently discovered in the district and will be worked this season. All of the men in camp feel greatly encouraged by the late developments.

Blue Jay Ore.—Messrs. Bradley & Hunter have brought several sacks of ore to town from the Blue Jay mine in Silver State district, for the purpose of shipping it to Salt Lake to have it worked. They expect it to work not less than $500 to the ton.

PARADISE DISTRICT.

Spring City.—*Reporter*, May 24: The Paradiso company is doing uothing outside of running a prospect tunnel. It has sufficient ore on its dumps to run the new mill several months. The Bullion mine has suspended for the present. The Big Prize company is taking out ore and shipping it to Torrey's mill. The Gulch claim is being opened rapidly, and is showing some fine ore. The Mount Rose company is opening its mine by running in its lower tunnel, which is now in 65 ft, showing indications of getting ore soon. The camp is very dull at present, but good times are looked for soon.

ARIZONA.

Oro Blanco.—Cor. *Citizen*, May 23: Oro Blanco mining district is still in *statu quo*. The warm weather has in a measure, retarded work. Mr. J. H. Haskell has employed a number of mon to sink on some mines located by Mr. J. M. Kirkpatrick, and situated about five miles northerly from the Ostrich mill. Three mines there are to be developed at once to a depth of 150 ft, the work to be prosecuted with true California vigor; no rest day or night. The mines are reported to average well, with large quantities of ore of sufficiently high grads to pay well for milling. The district needs a mill for reducing silver ors. Such would be equally beneficial to mill owners and miners. Large quantities of ore are now on the various dumps, and the mine owners are virtually prohibited, by want of means, from further developing their mines, whereas if a mill was in operation, the ore is rich enough in many instances to pay all expenses of working and yield a handsome profit besides. Messrs. Haraszthy and Smith, on their California and Monitor claims, have ore rangiog from $100 to $1,800 per ton, but without a mill their dumps represent only so much rock, they having no facilities wherewith to extract ths precious metal. Messrs. Flood, Kirkpatrick & Co., aod maoy others, are similarly situated. The Ostrich mill is at present only fitted up to put through gold rock, and while the owners aod the enterprising lessee, Mr. Hogg, realize the importance of having silver reduction works attached to their mill, and the financial benefits that would accrue themselves thereby, they feel that at present they do not have the meaos to warrant the necessary very heavy outlay. The Arivaca mill, which intends to employ the lixiviation process, is working but slowly to that end, and five or six months will probably elapse before they will be prepared to receive silver ore.

IDAHO.

Notes.—*World*, May 23: Henry Van Horn is about to make the transfer of his entire interest in the Yellow Jacket mine to a San Francisco company for a good round sum—the exact amount is not known. The company will erect a 40-stamp mill as soon as the transfer is made. A very large silver mine has been discovered on the South fork of Salmon river, 30 miles southeast of Challis, Lemhi county, by Mr. H. Lester and others. It has been located for two miles, and a road is being built to it. It is thought that the discovery will lead to the opening up of another important mining district. Messrs. George Brown, Edward Carr and William Tucker are at work on the Buzz Fuzz mine, discovered by them this side of the Elk Horn. As far as the ledge is developed it is a foot wide and the ore worth $25 to $30 per ton. The rock is of a white character, and contains some antimony. A Tuscaroan in Bonanza City writes that the snow is still very deep in that vicinity. Scores of miners are arriving there and at Challis daily, and when the snow melts, many of them will be employed to work on the claims located and partially developed last fall. Money is plentiful and Bonanza City will be the liveliest camp on the coast this summer. The Channell ditch has been opened and the water started through it. Work has been commenced in the extensive claims owned by Channell & Travis, on Willow creek.

Mrs. Daniel V. Stone, of Boston, has giveu $25,000 to the Young Mon's Christian Association toward ths erection of a new building.

President Grevy bas signed pardons for 400 more Communists.

Gen. Grant and party expect to arrive in California in July.

William Lloyd Garrison died at New York Saturday night.

Patents and Inventions.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports to Dewey & Co.'s Mining and Scientific Press Patent Agency.]

By Special Dispatch from Washington. D. C.

For the Week Enoing May 20th, 1879.

Rotary Ore Roaster—T. H. Blythe and Morey, S. F.
Targets—Wm. H. Broden, Webb's Landiog, Cal.
Fog Horn—E. T. Bucknam and H. C. Langrehr, S. F.
Seam for Shoes, Etc.—Jno. Jory, S. F.
Oil Cups—A. D. Hilborn, Oakland, Cal.
Steam Boiler and Furnace—M. N. Laufenberg, S. F.
Water Lifter—L. B. Lawrence, Monticello, Cal., and A. G. Strawbridge, Sharon, Pa. (2).
Single Propeller Pump—Oeo. Norton, Stockton, Cal.
Sample and Button Weigher—J. S. Phillips, S. F.
Engine Fire-Lighter—C. E. Thompson, Stockton, Cal.
Car-Truck—Harry S. Zink, Martiuez, Cal.
Air Compressor—J. B. Pitchford, Gold Hill, Nev.
Feathering Paddle—Chas. F. Winsor, Seattle, Washington Territory.
Lantern—Jno. Gilleg, Virginia City, Nev.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Apparatus for Target Practice.—Wm. H. Broden, Webb's Landing, San Joaquin county. Dated May 20th, 1879. This invention relates to an improved apparatus for target practice, which the inventor calls the "Practical Wiug Shooting Armator," and it is intended to present several movable objects at which to shoot, each moving in different directions or at different speeds, to represent the motion of different varieties of birds. The various devices are arranged at different elevations, so that practice may he had at surface shooting, or high shooting, and the objects may he moved in different directions and at differsnt speeds, so as to furnish a variety of moviug objects. The various objects are moved by a series of pulleys or belts and the objects themselves, in form representing different birds, may he made partially of metal, so as to give out a ringing sound when struck, and partly of paper, so that the fact of hitting the target may hs recorded. Witb these differently arranged devices operating from ths same power shaft, practice in several ways may be gained. Novices may learn to handle a gun properly under differsnt conditions and good shots may keep in practice without having to go to the field.

Fog Horn.—Buckman & Langrehr, No. 22 Steuart street, San Francisco. Dated May 20th. The invention relates to au improved fog horn, such as is used as a danger signal on sailing vessels in foggy weather. The improvements consists in providing a removable mouthpiece and in the peculiar construction of the reed-sounding apparatus. The reed is secured in place hy a screw, so as to be easily removable for cleaning or replacement, and its position on the mouthpiece is such that its vihration is rendered certain and the sound produced sonorous in its tone. It further consists in a peculiar formation of a mouthpiece which surrounds aud encloses the reed stem so as to provide an enclosed surrounding hody of air, which is set in motion by the act of hlowing and greatly augmonts the volume of the tone. This horn may he blown with eass and will make a noise loud enough to be heard in foggy weather a distance of a mile and a half or more, according to size. The inventors have made a great many for use on our coastiug vessels.

Hydraulic Water Lifter.—Lawrence & Strawbridge, Oakland, Cal. Dated May 20th. This novel watsr-lifting apparatus consists of a boiler or receiver which is set into a heating furnace, and has a pipe leading from near the hottom to a tauk situated above it. A float situated in the hoiler operates a valve which closes an opening in the uppsr part of the boiler so that the pressure of the steam gsnerating within the boiler will force the water into the upper tank, thus driving out tne air from this tank into the water-lifting tank helow. When the water in the hoiler is lowered to a certain point, the float will open the valvs and allow the steam to escape, thus relieviug the pressure and allowing tbe water to flow back from the upper tank into the boiler. A jet of water enters ths upper tank and cools it sufficiustly to relieve the water tank from pressure and allow it to fill again through a valve. In combination with this apparatus, the inventors employ a novel heating device.

Car Axle.—Harry S. Zink, Martinez. Dated May 20th. The construction of this truck is such that each pair of wheels is independent of the other in turning curves. It cousists in forming the truck with the usual central beam, having the trusses or frames extending out so as to enclose the outside boxes, in which the ends of the axles turn, in a manner similar to that ordinarily employed. Midway between the wheels is a supplemental truss with boxes whicb receive the center of the axles. The axlss are divided in the center so that while they are in line with each other and each pair of wheels will run as if upon one axle, they may havs an independent movement when turning curves, and each semi-axle will be supported at each end.

Seam for Boots and Shoes.—John Jory, S. F. Dated May 20th. The invention consists in grooving one side of one piece of the leather and stitching the edgs of the othsr piece to the inner edge of the groove. This piece of leather is tben hound over so that the seams will fall into the groove, and is stitchsd upon the opposite side so that the seam is neat and smooth with the heaviest leather. The groove receives and protects the seam from friction, and the seam may be mads either with or without a stay, or with or without a cord.

Water Lifter.—Lawrence & Strawbridge, Oakland, Cal. Dated May 20th. The invention is another apparatus for lifting water, by means of a pressure of a column of air in excess of what is needed to drivs the hot-air engins, by which the column of air is compressed, or in other words, the whole power of the engine is employed to compress air, a small portion of which is carried to the heating furnacs and expanded to drive the engine, while ths remainder is carried to the apparatus where it is to he applied to the raising of water.

News in Brief.

Eureka, Nev., has the measles.

Cetawayo is thrsatening Natal.

Tramps are committing hurglaries in Chico.

California has caught the "archery fever."

Last Saturday was Queen Victoria's birthday.

Over 1,200 mon are employed in the Sutro tunnel.

The Chinesc Amhassador has arrived at Madrid, Spain.

Indian Jack has been executed for murder in Shasta.

Virginia, Nev., had two shocks of earthquake on the 27th.

Vacaville peach orchards ars affected hy curled leaf.

The steamer *El Capitan* has heen repaircd and launched again.

Numerous foreign failures, with heavy liahilities, arc rcported.

There is a deficit of 80,000,000 francs in the Spanish hudgct.

Russia will soon add a number of swift cruissrs to her flest.

The police at St. Petersburg have been reinforced hy 150 soldiers.

The loss hy the reccnt fire at The Dalles, Or., is now stated at $200,000.

Hill, Supervising Architect of the Treasury, bas heeu rcstored to duty.

Herr Seydewitz has hsen elected President of the German Reichstag.

Germany and France are co-opsrating heartily on the Greek qucstion.

The bay crop ncar Elko, Nev., is liable to fail through want of rain.

The House passed the Warner silvsr bill Saturday hy 17 majority.

Over 6,000,000 feet of logs are now hanked on the shores of Lake Tahoe.

The Pasadcna, Los Angeles, schools havs closed on accouut of scarlet fever.

The steamer *Alaska* has heen ordered to return to San Francisco from Sitka.

The restoration of a state of siege in the Basque Provinces has heen postponed.

Judge Edwin Marsh, of Olympia, W. T., was rccently drowned in Puget sound.

Colin M. Boyd succeeds the late George F. Maynard as Auditor of San Francisco.

Incendiaries have hurned 186 houses in a village in the government of Ufa, Russia.

A fishing schooner has hsen lost on the Massachusetts coast, with a crew of 12 men.

A portion of the crsw for the *Jeannette* Arctic expedition are on their way to California.

A heavy seizure of logs has been mads hy Government officials in Washington Territory.

John A. Moore, of school questions notoriety in San Francisco, is teaching school in Texas.

The propagation of California trout iu the streams of New York is proving a great success.

Five vessels have arrived at Portland, Or., from Hougkong, bringing 2,000 Chinese passengers.

The King of Spain has signed a decree re-establishing a state of siege in the Basque Provinces.

President C. B. Wright, of the Northern Pacific Railroad Company, is ahout to rcsign his position.

Frankenstein, an Ultramontane, has heen electcd First Vice-Presidsnt of the German Reichstag.

The Southern California Horticultural Society offer premiums for brass hand music at their next fair.

The river Danuhe is flooding the country through which it runs, and the high watsr is doing great damage.

The negotiations for the transfer of the administration of the Eastern Roumelia to Governor Aleka Pasha have heen satisfactorily concluded.

The Shoewaecaemettes are barred from participating in the Henley (Eng.) regatta, on accouut of their having been mechanics or artisans.

Important Real Estate Transfer.

J. J. Bell, of Bell's toll bridge and ranch on Clear creek, on the Reading grant, four miles soutb of Rsading, Shasta county, bas sold out to Maj. W. W. McCoy, of Eureka, Nevada. The sale includes a large number of Angora and graded goats, some valuahle horses and other live stock. The land purchased amounts to several hundred acres. The house is pleasantly situated on the hank of the never-failing Clear creek, adjacent to lsvel meadow land on one side and modsrately sloping wooded pasturs land on ths other side. Ws understand that Maj. McCoy intends making additional buildings and improvements on the placs at once. Being close to ths railroad section house at the junction of roads from different directions, Bell's ranch now promises to he the nuclsus of an important place for the future, when the surrounding lands ars mors fully settled up and thoroughly cultivated. Accommodations will he offered the present season for a number of summer hoarders, who will no douht find a combination of advantages in favor of this location for abiding the year around. Maj. McCoy and family are wall known as old residents of San Joss, and many friends will bespeak for them a good wslcoms in their new location. Mr. Bell established his home at the crossing some 20 years ago, and is well known to the traveling public in ths northsrn couuties of California and of southsrn Oregon. He intends engaging in some active husiness in Reading or vicinity in dus time.

Every new subscriber who doss not receive the paper and every old subscriher not credited on tbe lahel witbin two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is uscessary to protect us and subscrihers against the acts and mistakes of others.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Orubsr's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

How to Stop this Paper.—It is not a horculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Settlers aud others wishing good farming lands for surs crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisemsnt appears from time to time in this paper.

Miss Beatrice Strafford will give a popular dramatic and musical entertainment at Dashaway Hall, San Francisco, May 31st.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

METALS.

[WHOLESALE.

Wednesday M., May 28, 1879.

Iron.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
Copper.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
Nails.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, May 28, 3 P. M.

Silver, 1¼@1.

Gold Bars, 890@910. Silver Bars, 8@12 ₱ cent. discount.

Exchange on New York, 20, on London bankers, 494@494. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 89½@90½.

London Consols, 98 15-16; Bonds (4%), 105.

Quicksilver in S. F., by the flask, ₱ lh, 36c.

Some fine sunny offices (next to the Press office), to rent (at very reasonable rates), by Dewey & Co., at 202 Sansome street, corner of Pine.

UNIVERSITY OF CALIFORNIA.

The June examination for admission to the Colleges of Letters and of Science, will be held at Berkeley on Thursday, Friday, Saturday and Monday, May 29th, 30th, 31st, and June 2d, each day at 10 A. M.

All who can should be present on the morning of Thursday. By order

M. KELLOGG, Dean of Faculty.

Mining and Other Companies.

Persons interested in incorporated eharee will do well to recommend the publication of the official noticee of their companiee in this paper, as the cheapest appropriate medium for the eame.

Gover Mining and Milling Company.—Location of principal place of husiness, San Francisco, California. Location of works, near Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the twenty-first day of May, 1879, an assessment (No. 39) of Fifty Cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin or legal currency of the United States, to the Secretary at the office of the Company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the first day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the eleventh day of August, 1879, to pay the delinquent assessment, together with cost of advertising and expense of sale. By order of the Board of Trustees. W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, Cal.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 1) levied on the 17th day of April, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
W B Douglass	90	23	$ 2 30
C J Pillsbury	34	2000	200 00
J C Rboads	03	500	50 00
J C Rhoads	05	3000	300 00
J R Robbius, Trustee	12	500	50 00
J R Robbins, Trustee	15	500	50 00
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	21	1000	100 00
J R Robbins, Trustee	22	1000	100 00
J R Robbins, Trustee	02	1000	100 00
J R Robbins, Trustee	60	134	13 40
J R Robbins, Trustee	77	50	5 00
J R Robbins, Trustee	78	50	5 00
J R Robbins, Trustee	85	100	10 00
J R Robbins, Trustee	86	100	10 00
J R Robbins, Trustee	116	833	83 30
J R Robbins, Trustee	120	76	7 60
J K Cooper, Trustee	107	100	10 00
J K Cooper, Trustee	108	100	10 00
J G Whitney, Trustee	39	1000	100 00
J G Whitney, Trustee	42	500	50 00
J G Whitney, Trustee	43	55	5 50
L A Hinds	55	1000	balance 71 50
Ambrose Hinds	108	100	10 00
T L Bibbins, Trustee	08	100	10 00
T L Bibbins, Trustee	00	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbins, Trustee	134	1000	100 00
T L Bibbins, Trustee	130	18	1 80
T L Bibbins, Trustee	145	800	80 00
T L Bibbins, Trustee	140	100	10 00
T L Bibbins, Trustee	147	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	153	30	3 00
T L Bibbins, Trustee	154	20	2 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	161	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	170	500	50 00
T L Bibbins, Trustee	173	77	7 70
T L Bibbins, Trustee	175	100	10 00
T L Bibbins, Trustee	182	100	10 00
T L Bibbins, Trustee	188	50	5 00
T L Bibbins, Trustee	180	50	5 00
T L Bibbins, Trustee	101	500	50 00
T L Bibbins, Trustee	204	500	50 00
M J Rhoads	110	2400	240 00

And in accordance with law, and an order of the Board of Directors, made on the Seventeenth day of April, 1879, so many shares of each parcel of such stock as may necessary will be sold at public auction, in the City of San Francisco, at the office of the Company, on Monday, the Sixteenth day of June, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale. T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

ARTESIAN

Well Drilling, Boring,

Mineral Prospecting and Quarrying Tools.

Highest Award at Centennial Exhibition. The best and most practical well-boring Machinery in the world. Quick-sand, boulders and rock easily handled. Address

California Artesian Well & Mining Co.

202 Sansome Street, San Francisco, Cal;

E. P. HILL, Manager. J. W. R. HILL, Engineer.

Dealers in Well-Augers, Rock-Drills, Wind-Mills, Pumps and Hydraulic Machinery, and Contractors for Artesian (Flowing) Wells of any depth to 3000 feet.

(Machines and Wells can be seen in operation.)

☞ AGENTS WANTED. ☜

W. BRUCKNER,

Mining Engineer,

Will Contract for the erection of

MILLS, ROASTING FURNACES, SMELTING FURNACES, AMALGAMATING WORKS,

— ALSO —

LEACHING WORKS,

With all the Lateet Improvemente. Addrese

STATE ASSAY OFFICE,

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ROCK DRILLS.

One or three Burleigh Drills,

Tunnel size. Good as new. Ready for use.

FOR SALE VERY LOW.

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$250 will buy the Right for the whole Pacific Territories for the BUCKEYE CLOTHES-LINE FASTENER (just patented.) Large profits to manufacturer.

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TO PACIFIC COAST INVENTORS.

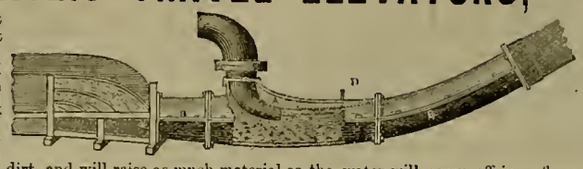
Our U. S. and Foreign Patent Agency presents many and important advantages as a Home Agency over all others by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the Mining and Scientific Press. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free.

DEWEY & CO., Patent Agents.

A. T. DEWEY. W. B. EWER. GEO. H. STRONG.

HYDRAULIC GRAVEL ELEVATORS,

For working flat gravel mines that have no dump.



Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

JOSHUA HENDY,

No. 51 Fremont Street, Office of the Hydraulic Gravel Elevating Mining Co., S. F.

STEEL CASTINGS.

From 1-4 to 10,000 lbs. Weight.

True to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 12,000 Crank Shafts of this Steel now running proved superior to wrought iron. CRANK SHAFTS, CROSSHEADS and GEARING, specialties. Circulars and Price Lists free. Address

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Works, Chester, Pennsylvia. 407 Library St., Philadelphia

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Manfuactory, 17 & 19 Fremont St., S. F.

ST. DAVID'S.

A FIRST-CLASS LODGING HOUSE.

CONTAINS 113 ROOMS.

715 Howard St., near Third, San Francisco.

This House is especially designed as a comfortable home for gentlemen and ladies visiting the city from the interior. No dark rooms. Gas and running water in each room. The floors are covered with body Brussels carpet, and all of the furniture is made of solid black walnut. Each bed has a spring mattress, with an additional hair top mattress, making them the most luxurious and healthy beds in the world. Ladies wishing to cook for themselves or families, are allowed the free use of a large public kitchen and dining room, with dishes. Servants wash the dishes and keep up a constant fire from 6 A. M. to 7 P. M. Hot and cold baths, a large parlor and reading room, containing a Grand Piano—all free to guests. Price single rooms per night, 50 cts.; per week, from $2.50 upwards

R. HUGHES, Proprietor.

At Market Street Ferry, take Omnibus line of street cars to corner Third and Howard.

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SAN FRANCISCO and SACRAMENTO.

AN ENGINEER,

Favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design Stationary, Marine, Locomotive, Mill Work, Sugar and Hydraulic Machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

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BRASS and BELL FOUNDRY

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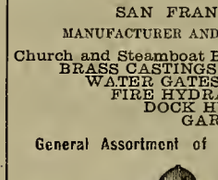
MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.



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For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

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Garratt's Improved Journal Metal.

IMPORTER OF

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES.

FOR SALE.

THE MACHINERY AND PLANT

— OF THE —

HOPE IRON WORKS,

— CONSISTING OF —

Pattern, Machine and Blacksmith Shop,

AND FOUNDRY.

Addrese THE HOPE IRON WORKS,

Potrero, San Francisco.

C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

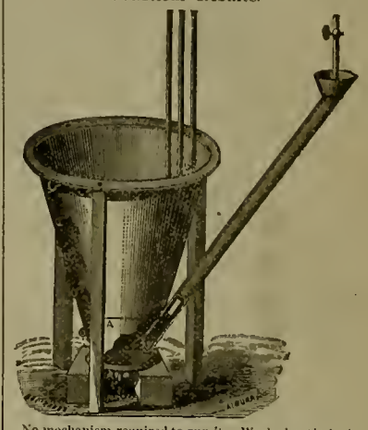
Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address C. C. BITNER, Spenceville, Nevada County, California.

STEVENOT'S

Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.



No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

E. K. STEVENOT,

Chemist and Mining Engineer,

304 Montgomery St., San Francieco.

REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

NOTICE

TO THE

MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Worke, are the only partiee authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the Licenee of thie Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, Preeident.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

The following are some of the Mining Companies who have recently adopted this Furnace, the most of which are now in successful operation, many of them running two and some three and four Furnaces.

NEVADA.—Grand Prize, Star, Martin White, Highbridge, Columbia, Alexander, Paradise Valley, Jefferson, Leopard, Eagle, Endowment, Independence.

ARIZONA.—Tiptop, Tiger, Peck, Hackberry, Corbin, Tombstone, Bradshaw.

OREGON—Monumental.

MONTANA—Alice Mine, Butte City.

MEXICO—Trinidad, Harmiguera, Plomoses.

PERU—Cerro de Dasco.

RANKIN, BRAYTON & CO.,

Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned as they will be vigorously prosecuted and involved in heavy damages.

Mill and Mining Machinery

OF ALL KINDS FOR SALE by BERRY & PLACE

At the Old Stand, Market, head of Front Street, S. F.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

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PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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Repairing promptly attended to at the lowest possible terms.

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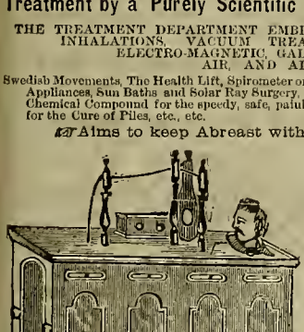

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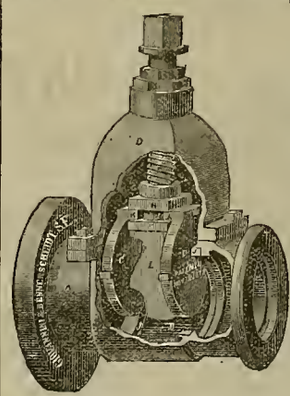

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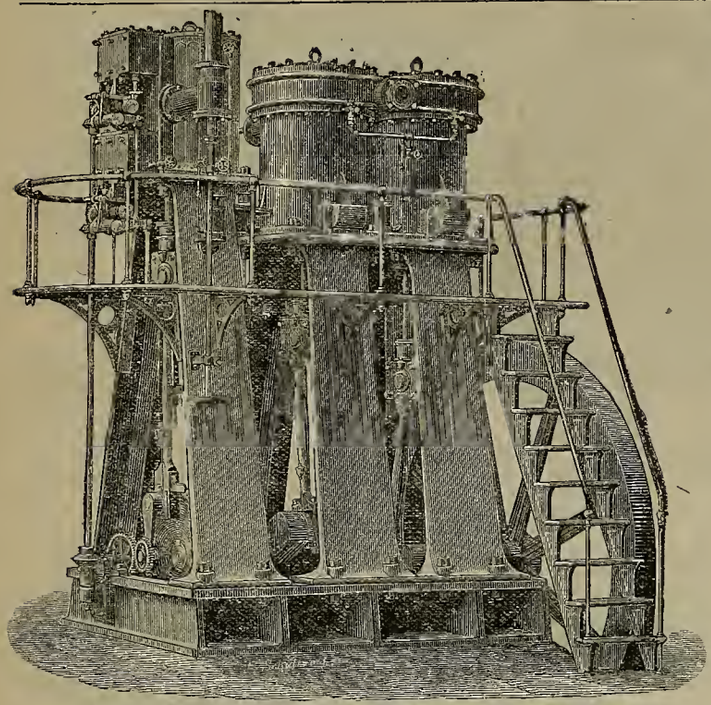

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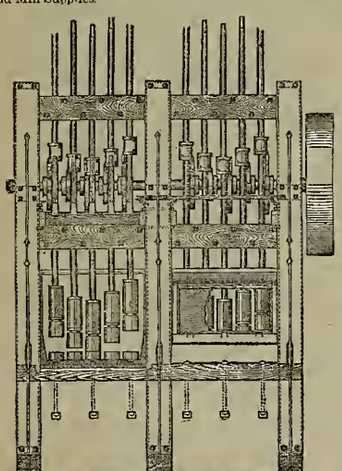

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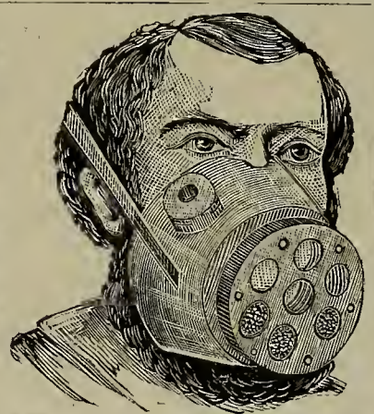

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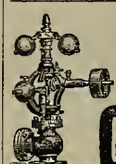

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An Illustrated Journal of Mining, Popular Science and General News.

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The Discovery of Gold in India.

It appears, from ths London *Mining Journal*, tbat rich gold deposits bavs recently been discovered in the district of South Wynaad, India. These deposits are spread over an arsa of 25 miles by 13, and no less than 90 outcrops of ore reefs, with a thickness of two to four fset, havs already been located. Ths ore yields from a fsw pennywsights to 200 ounces of gold per ton. These veins are declarsd to bs very similar to some of thosa most successfully worked in Victoria, Australia—abundance of visibls gold, and ths qnartz stained with iron in jnst ths sams way. Other specimens show the gold iu a nicely dscomposed matrix, whils othsrs consist of rich auriferous gravels. It appears that the district has bsen hitherto regardsd almost sxclusively as a coffee-producing district, and that Messrs. Smith, Fleming & Co. have besn actively eugaged in connection with the matter for the last two or thres years, but have delayed investigation in consequence of ths tedious nsgotiations for securing planters' rights. At the present time, however, they have every facility for sxtsnsive and profitable operations.

A few months ago this district was inspected, on behalf of Messrs. Smith, Fleming & Co., by Mr. Oliver Peglsr, A. R. S. M., the substance of whose report we quote in this article. Mr. Pegler's rsport is nscessarily crude and preliminary, owing to the difficnlties of making a careful and thorough inspection, being obliged to resort to a ruse to visit some of ths ledges, and elude the vigilaucs of the natives. Enough, bowsver, is known to sbow beyond douht that ths district is capabls of yielding enormous wealth.

The range of mountains on which the Wynaad district is situated is of vsry ancient dats, belonging to the palaeozoic psriod, more especially to that of the silurian formations. The highest peaks of the rangs ars formed of hard, dense, dark crystalline rocks of ths mstamorpbic series of granites, etc. The softer varieties of rocks ars prssent and form ths vallsys adjacent to tbe psaks. Thsse lattsr are of a ligbtsr color, and give a red and brown appearancs to the country. Ths average altitude ranges from 7,400 to 8,400 fest. The whole of the formations are impregnatsd with black magnetic oxide of iron, which, aftsr a shower of rain, appears as black sand on snrfaces wbere watsr has run over in streams. The whole of ths country is ramified witb a rnn of bold quartz vsins, which are true ledges. Ths general run of thess ledges is parallel, the direction of the strike bsing almost invariably north and south. These ledges, which are met with in every part of the country, are often of great breadth, 15, 20, and 30 feet in thickness, and are composed of white crystalline compact quartz, identioal in every respect with the vein qnartz of Russia, Australia, California and Nevada.

The quartz is of varied character, changing from the compact, sub-crystalline, milk-white stone to a decomposed granite more or less fernginons. The large outcrops are of the former, but as the depth is increased the quality changee into a decomposed ferruginous stone. The Bear ledge is an instance of the latter, while the Monarch ledge traced for nine miles shows a bold, dense lode, with an outcrop of true chloride or greenstone running very near it. From the appearance of the quartz ledges it is plain that the dense, compact, heavy lodes bave resisted denudation, and thus the high ridges and hill-tops are formed, while the softer portions of the ledge have been eroded away. The native minere avoided these adamantine ledges, and confined their working to the softer and more yielding ledges on lower elevations.

There can be no douht thac a great portion of the gold is closely combined with and held imprisoned by iron pyrites, which is undoubtedly auriferous in nature, and mucb resembles the auriferous pyrites of the Nevada mines. The ancient native minere well knew this, and calcined all the stone before attempting to separate the sought-for-gold, and to this day the intelligent Korumbars, wbo still mine and scarch for gold, calcine before crushing, washing and amalgamating tbe residual fine gold.

Operations are only carried on by native washsrs in the recent surfacs earth, which spreads over the whole country, and in the present river beds and bars. But little is known of rccent deep alluvial deposits, which occur as large exteuding flats, and are now swamps ntilized for cultivating rice and paddy. At or near Dsvalah in this district, Mr. Pegler discovered evidences of extensive old workings on ons of thsse flats, numsrous pits or sbafts having been sunk, probably to ths lowsr whits clay or mother rock, and the lower stratum of recent earth, debris or clay, would contain ths gold.

Satisfactory proofs have been arrived at of the presence of ancient deposits in the Wynaad, a Mr. King having made a clossr inspection. At

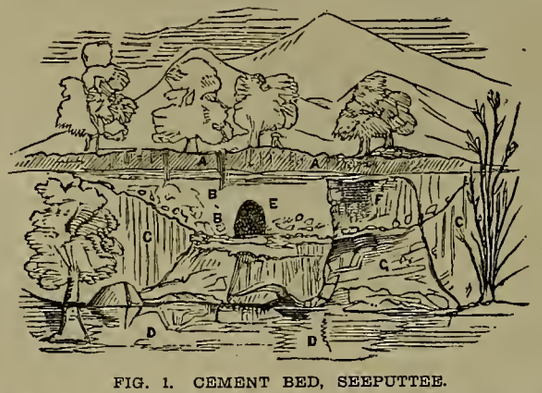

FIG. 1. CEMENT BED, SEEPUTTEE.

Seepnttee, ths present river of that name has cut through an ancieut aud trus cemeut deposit. The ancient bed exists as a mixture of rolled pebbles, mostly quartz stone, etc., cemented with the sand and also white clayey and silicious ssams into a hard dsnse conglomerate. The natives had anciently mads some attempts at working the bed, and had evidently removed soms four tons of the material, but the small amount of gold present discouraged further work. Thers can bs no doubt that the lowest strata of this deposit might bs worked to a profit, as there is sufficient water adjacent for almost any purposs.

The bed rests on the mothsr rock, which is

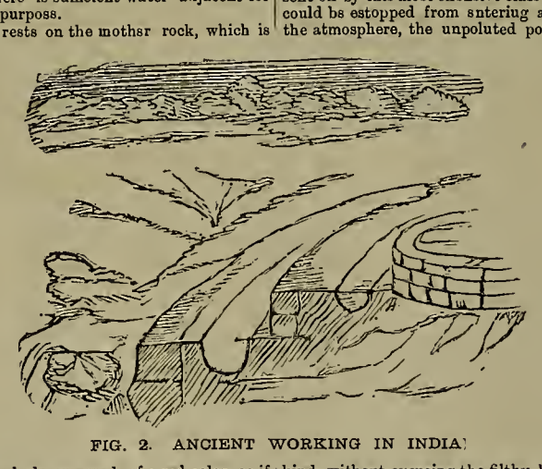

FIG. 2. ANCIENT WORKING IN INDIA.

very soft and decomposed, of a red color, as if of a granite or gneissic nature. The present stream cuts it almost at right angles, and there can be no douht that the old bed represents a true auriferous cement deposit, and was deposited by a very different system of river coursee and flow to those existing at the present day. It has been pierced to some 20 or 30 feet by a drift, which was full of water when discovered, hut which did not prevent inspcction.

We give a faithful representation of the alluvial cement bed at Seeputtee, as it appears on the river side.

A, *A*, surface soil, from 5 to 10 feet; *B*, cement bed, or ancient river bed; *C*, decomposed vertical rock; *D*, present river Seeputtee; *E*, old working; *F*, short drift, recent; *G*, excavation in soft rock under old cement beds; *B*, lowest layer, very large pebbles, much rounded.

Thsre is no room for conjecturs in regard to the ancient working of these deposits, in fact the accidental circumstances which brought them to light wsre msrely a rediscovery. We reserve for anothsr article an examination into thess ancient workings. Ws subjoin, howsver, a cut showing remains of old work in the shape of retraced sluicings, the face of each stage being hnilt up with country stone, granits, or similar material.

WANTED, A SUPPLEMENTARY "SMOKE-CONSUMER."—Among the recent triumphs of mechanical genius is the "smoke-consuming engine." What of annoyancs from smoke, soot and flying cinders is through this devics avoided, mucb-traveled people by rail can attest. Would now soms inventor ariss equal to ths occasion, and through tbe contrivance of a "smoks-consuming tobacco sucker," relieve tbe world of that first-class abomination, hs wonld entitle himself to the thanks of the sslf-respecting and cleanly for all tims to coms. If only the fumes sent off by this most offsnsive class of "suckers" could bs estopped from snteriug and poisoning the atmosphere, the unpoluted portion of mankind, without excusing the filthy habit of these people, might feel constrained to endure the etench emitted by their persons in sadness and silence. We await the advent of this gifted inventor.

OUR AGENT IN NEVADA.—Mr. S. V. Blakeslee, traveling agent and correspondent for the PRESS, is now on his way through Nevada in the interest of our publications. He will represent us in business transactions and will keep our readers informed of the latest phases of industrial progress which come under his observation. We bospeak him a kind reception among our friends in the Silver State.

IT is thought that Germany will return to the bi-metallic policy.

A Breezy Time and a Booming Market.

Ths *Evening Post*, of sound jndgmsnt gensrally on mining matters, avers that this is going to be a grand year for mining excitements, especially on the Comstock rangs. And this excitemsnt is not going to bs a tams affair either, nor yet local in its effects—it is to bs wide-spread and a vsry whirlwind, swseping the country from the Atlantic to the Pacific. And in this we suspect our contemporary is right. Ws gusss things ars going to bs a little breezy in the stock world bsfors long. And why not! Are not our finances in a bsalthful condition and ths country in a prosperous way? Though not sxactly flourishing our industries ars improving, and there is not hy one per cent. as much misery in ths land as there was a year or two ago.

Through soms slightly restricted expenditure and the practics of a little more economy our psople havs so traveled up out of the valley of tribulation and suffering that thsy can percsivs on the far off horizon a faint gleam of hsttsr times. Of courss they can, and hsing a sensible people and grateful withal, shall they not now show their appreciation of such slight amendment in their material affairs by indulging in a littls stock spcculation? Now that they can afford it, shall they not hazard a littls monsy in the mining sharc markst which promises soon such animation and profit? We should say thsy might, and advise all wbo require furthsr lessons in this school to coms right up and take them now. If their system needs this sort of medicins it is as well to take it and gst cursd at once.

To a person of this kind we would say, if you have not the money in bank or just where you can lay your band upon it, why, pawn your watcb, spout your jewelry, mortgage yonr homestead or hypothecate your wages and raiso it. This, in tbe first instance; it will hs time snough to abstract the publio fnuds committed to your care, misapply fiduciary trusts and steal from your employer after thess privats resources have been exhausted. But in no event should you neglect the opportunity afforded to make money hy this promised booming of the stock market. To all who have not yet had enough to do with this wretched business of stock gamhling ws would say, jump in and at the approaching upheaval havs dons with it. Don't be scrupulous, don't delay; discount the good tims coming and make hasts to be rich. Catch ths scent and follow the trail of fleeting fortuns though it lead through insanity and suicide down to ths chambers of final psrdition. Go in, you may not live to ses another booming market, aud even though you loose your money you may yet enjoy yourssIf, for, as Hudibras puts it,

> "Soms think ths pleasure is as great
> In being cbsated as to cheat,"

As remarked at the outset, we should not be surprised to see greater animation in mining shares before long. A movement looking to that end is in progress. The machine is bsing charged and after a few more turns of the crank will begin to sparkle and splutter, preparatory to throwing off those brilliant corruscations that so electrify the stock market. If when it gets well at work a good many sball be struck with metaphorical lightning it will be in accordance with past experience and the purpose for whicb the thing was gotten up.

METEOROLOGICAL SUMMARY FOR MAY.—The report of the United States Signal Service officer of San Francisco, for the month of May is summarized as follows: The mean hight of barometer for the month was 30.10; mean temperature, 55.9; mean humidity, 70.7; prevailing winds, west; highest barometer, 30.29; lowest, 29.92; highest temperature, 75°; lowest 45°; monthly range, 26.5°; greatest velocity of wind, 30 miles per hour; total number of miles trayeled hy wind, 7,923; total rainfall, 2.33 inches. Rainfall in May during former years: 1872, .18 inches; 1873, 3.00 inches; 1874, .66 inches; 1875, .22 inches; 1876, .24 inches; 1877, .18 inches; 1878, .16 inches.

THE Senate has passed the bill making subsidiary silver coins interchangeable with greenbacks or standard silver dollars.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Working Base Ores in Utah.

EDITORS PRESS:—Believing that au article on the subject of amalgamating hass metal ores will he of interest to your readers, I send you the following account of the successful working of hase metal tailings at the Marsae mill, in this place, by H. S. Jacohs, a professional amalgamator and expert of long practical expsrience. I will treat the subject as fully as it may he done, without trenching upon professional secrets, for, like other skilled labor, this handling of ores becomes a complicated art proportionately with ths increase of the bese metals, and the difficulty of separating the precious metals therefrom without great loss of quicksilver.

In order to do this euccessfully the amalgamator must possess a considerable knowledge of metallurgy and also of chemietry, in so far as it relates to the dissolving power of chemicale upon sulphurets, pellurets, antimony, arsenic, etc.; and tends to keep the quicksilver in perfect form eo that amalgamation may take place before new combinations, are formed of tbe freed metale.

Only a few years ago it was considered impracticable, if not impossible, to beneficiate oree containing more than from 5% to 10% lead, or half that quantity of antimony, arsenic or zinc, by amalgamation. But this clase of ores after roasting in the Stetefeldt furnace can be successfully treated, as the working of the Ontario ores at this place fully establishes. This is the worst ore I have ever seen treated by amalgamation. Although very rich, it is full of the base metals mentioned, the most of the lower levels containing a much larger percentage of these than cited above, and without this furnace could not be worked to a profit. The ores taken from the surface and upper levels of the Ontario were, when the mill was huilt, comparatively free milling. Had the ores on top heen as base as at present, the company would probably have tried smelting from the start. It is well for the owners of this class of mines that circumstances have compelled this company to show what may be done by skill and enterprise.

It is impossible from the surface ores of this Territory, to predict what may be the nature of those only a few hundred feet below. Free milling ore on the surface may change to rich galena, or rich galena to chlorides as we go down, eo that the kind of reduction worke required is a problem to he solved only by deep exploration. Despite the moet skillful treatment a certain percentage passes off with the first working, to be again treated in the form of tailings, after they have passed through a process of decomposition and oxidation, so far ae the nature of the metale and minerals will admit of the same. In California it is well known that the sulphurets from gold-bearing rock, extracted from below the water levels, known ae "raw eulphurets," cannot be euccessfully treated by the ordinary pan process without the aid of powerful decomposing chemicals, though this can be worked to 85% or 90% after lying exposed to the atmosphere until the iron is thoroughly oxidized. Thie result, however, is not obtained with the Ontario tailings. Antimony, zinc, gray copper and arsenic, if they are subject to decomposition at all, decompose in so slow and imperceptihle a manner that human patience would be exhausted waiting the natural action of the elements in this direction. How then can they be treated?

Before answering this question it is necessary to state that the Marsae mill is owned and was built by a company of Michigan men who believed they had a mine of milling ore in the Flagstaff, a belief that bas not yet been verified. The Ontario company, before building a mill of their own, leased and ran the Marsae; it is the working of these tailings, and also tailings from the Ontario mill, some of them roasted and some raw, of which we propose to speak. These tailings, having heen often examined by practical men, were sent to San Francisco, and there tried and condemned as refractory and unworkable to a profit, although they contained, as tested by fire assays, an average of $30 per ton.

After the Ontario company had completed their own reduction works and ceased to operate the Marsae mill, it remained idle for a time, until Mr. Edward P. Ferry, a brother of the Senator from Michigan, took hold of the property, with a view of testing, practically, the mooted question whether these rebellious remains could he worked to a profit. He was fortunate enough to eecure the eervices of Mr. H. S. Jacohs, a practical and scientific metallurgist and amalgamator, who now confesses that he was at first deceived by imperfect preliminary assays, which showed only the silver contained, without the base elements to be contended with, declaring that he would not have undertaken the task if a proper analysie had been given him. Having entered upon the task he determined to pereevere, and is now working these ores with a profit of near $200 per day over expenses, though old mill men predicted entire failure or great lose of quicksilver. The tailings here contained so much pay, and the Marsae company had expended so much money in the building and outfitting the mill, etc., that they were loth to discard it altogethsr. They tried concentration and found the material would pay, hut much of the best of it was wasted. Yet they could not consent to have the mill lying dead property, with 20,000 tons of tailings before it that should he worked and which are now giving employment to 100 people. All was done by the employees of the Ontario company, in the first working of the ore, that they could possihly accomplish. Ths escaping silver is wrepped up in combination with antimony, zinc and gray copper, which can only he attacked hy powerful chemical action of a kind which would he inoperativs in the whole mass of ore. To effect a more perfect amalgamation, the whole of the metals must he changed to chlorides. The loss that still goes off with the tailings is that portion of the hase metals that contain silver, which will not chloridize. One of the worst, if not the very worst metal in this ore, is the gray copper mentioned. It contains antimony, sulphur, iron, arsenic and copper, with silver. It is believed that this is the richest base, and that a large percentage of the silver goes off in this combination which cannot be decomposed by such an amonnt of chemicals as it would be profitable to employ for that purpose, working the stuff in quantity. It ie needless to eay to those having a knowledge of amalgamation, that all of the base metals enumerated have a sickening effect upon the qnicksilver that must be constantly worked againet. The treatment that will keep it in good form a few days cannot be continued *ad infinitum*. For instance, in the early employment of sodium amalgam, it was soon found that by constant use it lost the desired effect, wherefore some other chemical had to be employed to attack the disease. It was formerly helieved that frequent retorting would cleanse the quicksilver. This, however, ie only a temporary expedient; the sensitive metal must have its stimulants. One of the finest improvements made by Mr. Jacobs, and which will be appreciated by old amalgamatore, is the employment of a syphon in the settlere to constantly draw the water from the enrface. The nozzle being only an inch helow the surface draws off the contents, without taking quicksilver or drawing the plugs, which are distant from each other about ten inches. The loss of quicksilver, in working by this plan these difficult materials, ie less than half a pound per ton, ehowing that the portion that cannot he saved is not lost in this way. Thc allowable lose of quicksilver in working Comstock ores was formerly three pounds per ton. How much that has heen reduced of late years, I am not prepared to say, but the actual loss in moet mills far exceeds a half pound with ordinary oree. "'49ER."

Park City, Utah, May 20th, 1879.

Letter from the Comstock.

EDITORS PRESS:—The principal work going on at the mines in tbis vicinity is preparatory to the development and extraction of ore. The Alta and Benton bave, for a long time, been engaged in einking to different levels, opening stations and extending drifts along the lode preparatory to crosscutting at various points. When thie is commenced, owing to the condition the minee are in, ore extraction, wheu begun, can be continued to much advantage, but little dead work being thereafter needed. These mines shonld be enabled to continue the outpnt of ore constantly for a long time, that ie if ore bodiee exiet in them—a fact which ought to be pretty well established hy this time. They have the same lode as tbe Justice. The matrix of the metals is principally gypsum, the same ae in the Juetice and Occidental mines. If the Forman shaft is continued to a certain depth it will no doubt strike tbe same lode, which, of course, is entirely independent of the one on which the Overman and Caledonia were originally located. The Forman ehaft is now being sunk by the Crown Point, Belcher, Segregated Belcher, Overman and Caledonia companies, and will he the one through which these mines will be eventually worked. It is eome distance east of the new Yellow Jacket ehaft. Besides the Yellow Jacket mine heing worked through their new shaft, the Imperial Con., Bulbon, Alpha, Exchequer, Confidence, and the other small mines in that vicinity, will also do their work through that shaft, which ie now the deepest perpendicular shaft in the State, being over 2,500 feet in depth. The greateet sloping depth attained by any mine here ie that of the Belcher incline, which is now about 2,700 feet, and is to be continued on to a depth of 3,000 feet. With all the labor and expenditure of money it ie to be hoped that the stockholders will be rewarded through the development of a hig bonanza. If having attained a depth of 3,000 feet, and the ground at that depth has been explored in different directions, a body of rich ore is not found, then it may be considered to he an abandoned mine. As for continuing the working to any greater depth, that would be almost impossihle, and if any deposit was found it would have to be almost pure silver to make its extraction profitable, as the heat of the water and air would be almost intolerable. It is possihle, at great expense, to cool the air, but not the water. The Chollar, Potosi, Hale & Norcrose and Savage are doing nothing more than keeping matters and things about the mines in order; waiting for the Sutro drain tunnel to hs completed, when these compenies propose to reveal to the world the bonanzas that they would have us helieve are huried there. They are now in a condition to dispose of their surplus water cheaply. This place depends on their success largely. The Gould & Curry and Best & Belcher are also idle, except keeping things in shape; waiting for the sinking of the Osbiston shaft. The most that they ars doing is the running of a drift, jointly, east to connect with that shaft when in reaches the 1700-foot level. The sub-drain in the Sutro tunnel will not he completed hefore the 1st of July, when the work of enlarging the tunnel, where it is not of the requisite size, will be commenced, and which will take much time and money to complete. The work on the lateral tunnels, north and south, can, and probably will, he carried on at the same time. The yield of ore from the Con. Virginia and California has been much less this month than for April, which makes it look as though no May dividends would be paid. Tbe Ophir is taking out about 70 tons of ore daily, and there is some prospect that the amount may he increased, yet this is not absolutely certain, although a short time ago the puhlic was given to understand that the output of ore would steadily increase.

J. D.

Virginia City, Nev., May 30tb, 1879.

The Horn Silver Mine.

Mr. W. A. Hooker, Mining Engineer, eends the Salt Lake *Tribune* the following report of Utah's bonanza, the Horn Silver mine: This immense hody of ore, reported to he the greatest yet diecovered on the continent, lios in the San Francisco mining district, Beaver county, 225 miles eouthwest from Salt Lake. It was diecovered September 24th, 1875, by James Ryan and Samuel Hawkes, who sunk a shaft ahout 30 feet on the ore, when they sold their claim the February following, to Messrs. A. G. Campbell, Matthew Cullen, Dennis Ryan and A. Byram. The purchasers immediately eet ahout developing the property, their labor resulting in proviug the vein to a depth of over 280 feet, and extracting 25,000 tons of ore which has been turned into bullion.

Almost the first work done in the mine was the driving of a short tunnel towarde the footwall, at a point 150 feet eoutherly from the original ehaft, and within this tunnel a winze was commenced. Subsequently the ground above was removed from the entrance to make room for the working shaft. The ore is here partly covered with a cap-rock of quartzite; but in blasting down this material, and leveling off the surface, ore was discovered for a distance of 50 feet. The report gives minute details of the work doue in the mine, of which the following is the summary: The principal working shaft is near the center of the claim, at tbe discovery. It extends vertically 113 feet to the hottom of the third level. The first level is distant 46 feet from tbe mouth of the shaft. Twenty-eight feet below, or 74 fcet from the surface ie the second level; and 40 feet helow this again, or 113 feet from the eurface, is the third level. The fourth level, 91 feet below the third, is connected with it by three winzes. The fifth level is 50 feet helow the fourth, or 255 feet from the month of the working shaft. The old ehaft lies 145 feet north of the working ehaft. It was continued down to the line of the second level, and connected with it by a drift.

The ore thus far removed has been taken from between the firet and third levels; the lower levele having been driven merely to explore the vein. The first level is entirely in ore, no indications of a wall being observable. Betwecn the first and secoud levels are three floors, and still no indication of a wall is seen; the timbers being eurrounded on all sides with ore. The total length of the second level, measured in a straight line, is 295 feet. Between the second and third levels there are five floors, all of which are eurrounded with ore. The old shaft was sunk its entire depth in ore.

The length of the third level in a straight line is 300 feet. The southern end consiste of a drift 56 feet long. Near its beginning, on the west side, is what appears to be footwall clay, and a similar material appears at the further end, which is thought to mark the approach to the hanging wall. This level is connected with the fonrth by three winzes. No. 2 is the only one in use, and the only one accessihle. It is 91 feet in depth, etriking footwall clay ncar thc bottom, and ehows pure ore its entire length. In the fourth level a different character of ore is reached, which lcaches readily and carries a fair amount of silver. About 100 tons has been taken from this level, which was treated euccessfully in the leaching worke in Frieco. The main drift on this level has been driven on the boundary line between the smelting and the leaching ores. The timbers in the eouthwestern end of this level rest directly on the eolid footwall. The wall rock is concealed below the timhering, bnt ferruginous clay overlies it. This affords a hasis for measuring the exact width of the vein, one of the few places in the mine where a measurement can he made. Here its horizontal width is 45 feet. The fifth level consists of a single drift, which discloses excellent smelting ore; near the bottom of the winze it merges into footwall clay.

The milling ores constitute the richest portions of the deposit, carrying from 75 to 200 ounces of silver to the ton, while smaller samples run into the thousande. The smelting ores comprise the greater portion of the ors mass, heing soft and earthy, consisting esssntially of sulphate of lead, with some plumhic ocher and carhonate of lead, all carrying silver. The lead ranges from 30% to 60%, and the silver from 30 to 75 ounces. The leeching ore, as mentioned above, occurs in the fourth and fifth levels; it differs from the other ores in appearance, and is white, red and yellow. A partial analysis of this ore showed 86 ounces of silver to the ton. Ths average of 1,271 tons reduced by the Frisco Smelting Company, up to March 1st, 1878, was 44½% of silver and 41% of lced, and the average of 5,612 tons reduced hy the sams company from March, 1878, to February 1st, 1879, gave suhstantially the same results. In estimating the amount of ore exposed in the present workings, Mr. Hooker, after a careful measurement, and allowing for wastage, horses, etc. (figuring 10 cuhic feet to the ton), finds 513,000 tons of ore in sight in the mine.

The quantity of ore extracted up to February 1st last is given at 22,712 tons. During Febraery about 90 tons daily was taken out, making a total of 25,000 tons. The cost of taking out this amount of ore a day is figured at $3.05 per ton. The cost of smelting one ton of ore is stated at $18.54, bnt this cau be materially reduced by extending the facilitiee and on the completion of the railroad to Frisco. One ton of base bullion is derived from 2⅜ tons of ore. The cost of producing this ton of base bullion, including everything (freight to Chicago and expense of refining added in) is $108.09. The product ie as follows:

92.50% lead at $70	$ 64.75
107.7 ozs. silver at $1.10	111.87
Total	$176.62
Balance, profit on 2⅜ tons of ore	68.53
Or profit per ton of ore	$25.86

Mr. Hooker concludes his report as follows: While it would seem to be impossible to exaggerate the wealth of this property, the estimatee made in this report are believed to be rather under than above what may be reasonably anticipated upon a purely financial basis, and certainly with such favorable circumstances on all sides—au unlimited supply of ore of excellent quality, good and cheap fuel and fluxes, direct communication with market, and, it is to be hoped, judicious management, the conditione of a most successful enterprise appear to he satisfied.

The property now having passed into the hands of a company abundantly able to extend its facilitiee and inorease its output, and the completion of the railroad to Frisco heing a matter of ehort time, the cost of mining and reducing the ore will be considerably reduced, and the margin of profit correspondingly increased. This report confirms all that has hitherto heen said of Utah's great bonanza.

Re-locating Mining Claims.

For the information of parties making inquiry in regard to the law governing the re-location of mining claims, we here pubbsh the same, which is ae follows: "The re-location of abandoned lode claims shall he by sinking a new discovery shaft and fixiug new boundaries, in the same manner as if it were the location of a new claim; or the re-locator may sink the original discovery shaft 10 feet deeper than it was at the time of abandonmeut aud erect new or adopt the old boundaries, renewing the posts if removed or destroyed. In either case a new location stake shall be erected. In any case, whether the whole or part of any abandoned claim ie taken, the location certificate may state that the whole or any part of the new location is located as ahandoned property."

In this connection it may be well to state what has been judicially decided constitutes an abandonment of a claim, and which, as will be seen, rests in the intention. "An abandonment takee place when the ground is left by the locator, *without any intention of returning* or making any further use of it, independent of 'any mining rule or regulation.'" We are inclined to think, however, that where all legal requirements have been complied with, the intention to abandon would have to he proved in a very positive manner, and could not he established hy mere inference.

HISTORY OF THE YELLOW JACKET SHAFT.—There is kept at the Yellow Jacket new office a perfect history of the new shaft, and in euch a way that it can be reviewed at all times. It consists of specimens of the rock taken from every five feet of the shaft. These are kept in a convenient cabinet arranged for the purpose and fitted up with drawers and partitione in the drawers for keeping each epecimen of the rock by itself, distinctly labeled and ready to be referred to at a moment'e notice. This of itself ie very interesting, but the study of this history is greatly facilitated by another arrangement. A portion of each specimen is reduced to a pulp and spread to the thinness of paper on a slide, ready to be euhmitted to the microscope. The ingredients composing the rock are thus unmistakably set forth and in such a way that comparison can be made between any two portions of the shaft. These of themselves form an interesting study. The ends to be eubserved hy this collection are obvious.—*Gold Hill News.*

THE price of silver hae lately undergone a marked advance in both London and New York, the market being still strong with an npward tendency. The outlook for the producers of this metal ie encouraging.

MECHANICAL PROGRESS.

Molds and Cores for Casting Steel.

Steel made by tho open hearth furnace comes therefrom very much hotter than when melted by any other known process, Mr. George Cowing, of Cleveland, Ohio, has, therefore, been induced to invont an improved mode of casting. It is on accouut of this intense heat of the molten steel that difficulties heve arisen in castiag, as the coutact of tho steel with the walls of the mold fuses tho material of the mold and forms a flux or scoria that coats tbe casting and is difficult to remove. This effect takes place with all materials that havo been heretofore used for uiolds. Common sand, plumbago, charcoal, coke, and other matorials have beeu tried, but the foreigu mattere contaiued in these substances are of such a nature that the succcssful preventiou of flux or scoria has not been heretofore accomplished. Tho object of his invention is to coastruct a mold from a substance that is adapted for ordiuary uso as molding material and possessee refractory qualitiee sufficient to successfully resist the tendency to flux when brought in contact with the hottest molten steel. According to his invention, silica is used in the construction of molds for thie purpose, as it has been discovered that pure silica, with suitable binding material, answers the requirements set forth, and that by its use, steel castings may be produced almost or entirely free from the flux or scoria. Iu proportion as the silica used for molds contains limestone, feldspar, mica, or othsr silicates, oxide of iron, or foroign matters of any kind, the castings will bo coated ae described, and sand, such as is used for molds, contains silica more or less mingled with the substances named.

Tbis fect, without doubt, explains the reason why it has been heretofore considered impracticable to use sand molds or molds made from powdered stone, old clay pots, or like material for casting steel from an open beartb furnace. Ia oarrying out this invention it is preferred to obtain the silica from rock crystal, white pebbliss, or white sand; if white pebblee are used they ehould first be pulverized and thoroughly freed from oxide of iron or other foreign matters. When ahout to be formed into molds the silica is to be mixed with any appropriato binding material, such as molasses, sour beer, flour, or other glntinous substance, eilicate of alumina, or the like, care being taken to employ no subetance containing any metallic oxide, or anything that migbt flux. A sufficient qnantity of the binding material will be mixed with the pulverized silica to form a plastic mass that can be molded, and will retain its shape after molding. An additional advantage ohtained hy the application of this invention is the ability to cast mild steel—*i.* e., steel having a low percentage of carhon, which cannot he done in molds consisting of or containing plumbago, graphite, coke, or other forms of carbon without subsequent annealing. As etated bofore, he is aware that materials containing more or less silica have been used for molds, but in such materials the refractory qualities of silica which render it useful for the purpose are neutralized by the other materials.

Salt in the Manufacture of Finished Iron.

The question of the best method of applying salt in tbe puddling process has just been discussed by the managere of the mills and forges of South Staffordshire and East Worcestershire at a numerously attended meeting of their associations under the presidency of Mr. Price, manager of the Brettle Lane Iron Works, Stourbridge. Members stated they had thrown dry salt upon tbe bottom of the puddling furnace before the charge was put in, and upon the iron as it was about coming to the boil; that tbey had used it as a mixture with manganese, and as a mixture with firo-clay and red-ore. It had also been used in solution with water to saturate the bull-dog in the preparatiou of the fettling, and its use in soluticn adopted by Messrs. Nettleford was also epoken of. The quantity of salt used varied in nearly every case. As much as four pounds of dry salt had been thrown upon lean iron beginning to thicken, and the result was that the iron boiled fluid; when shingled, was hard like steel; when broken as a har, was highly crystalline; and after heing boiled, re-heated and drawn out tbrough the rolls, was very hrittle. Thrown upon the furnecs-bottom salt benefited the fettling. Used as a "physic" with manganese in iron for sheets it was found of advantage, since the bars were clear, and when rolled out the sheets bad a good surface. In getting up lean and soft iron for sheets it was found of especial advantage as a hardener. The mixture was deemed good for steel iron. Mr. Jeremiah Jones, manager of the Terry Hill works, bad with advantage used dry salt and manganese, in the proportion of two pounds of the former to three ounces of the latter, in the manufacture of iron for sheets. Melt mixed with fire-clay and red-ore and thrown in tbe bottom of the furnace had been found by Mr. William Farnworth, manager of Messrs. E. and W. Baldwin's worke, to harden the sheet-iron, and give the sheets a dry surface.

Mr. Farnworth bad also experieuced good results from throwing cold water on tbe iron wbile it was in tbe furnace. Ae to tbe application of salt and water upon the patented metbod of Mr. Barnett, Mr. Ellis, menager of tbs Primrose Hill Iron Works, said that he had tried it under Mr. Barnett's directions: One pound to one and one-half pounds of salt were dissolved in a quart of water, aad more water was afterwards added. This eolution was applied to a furnace for a fortnight with the result that it improved the fettling and the bottoms. The patentee's charge was, however, for his method of application, too expensive, and it was not continued. Mr. Cresswell, mill and forge manager at the Earl of Dudley's works, had employed tho solution on Mr. Barnett's principle for some months. He used ahout as much salt as had been used at the Primrose Hill Iron Works. It had been employed in a siuglo furnace and in a doublo gas furaace, and the rosults were the more satisfactory from the gas furnace. A comparisou of the yield of a gas furuace worked without tho solution and of ono worked with it showed a larger yield by one quarter and a few pounds from the latter. Tho bulldog was saturated with tho brius, about one gallon was poured on the double furnace bottom, and when tho chargs began to thicken about five quarts was put in on each side of tho doublo furnace. One furnace had been worked throughout a whole week, and no scrap ball had had to be used. Mr. Cresswell had known one fettling stand nine heats.

After hearing those and other similar experiences the meeting was of opinion that where hard steely irou was required the application of salt in eolution was beneficial, but where pliable and ductile iron was needed salt ehould not ho used. The information received was not, however, considered to be complete, and the further discussion of the subject was adjourned till after the annual trip of the association, which will be taken at the close of May, to the Castle Iron Works of Messrs. Nettlefold, in Shropshire, where the patented method ie working euccessfully.—*Wolverhampton (England) Chronicle.*

Casting Metals.

Hollow or ring-shaped ingots of steel or otber metal are ordinarily made by casting the metal in a mold, in the center of which is placed a core of some euitable material, by the removal of which after the ingot or casting has become solid the required ceutral hole is left. This plan of casting the metal rouud a core presents several inconveniences, one of the chief of which is that the casting, if it is thin, is often less sound or less solid than a block of metal would he of the same bulk, but cast without the central hole; moreover, special precautions must iu most cases be taken to avoid the risk of the metal cracking or tearing as it coutracts round the core in the act of cooling.

Witha view to overcome these inconveniences, Messrs. Taylor and Wailes, of Panteg, propose instead of making such ring-shaped ingots or castings in a mold in the center of which a core is fixed, hy the removal of which, after the metal has become solid, the required hole through the ingot or casting is left as above mentioned, they pour the metal into a mold, which is kept in rotation by preference round a vertical axis by mechanical means at sucb a high velocity that the liquid metal as soon as it is poured iuto the mold, is driven by the centrifugal force caused by the rotation of the mold against the inner circumference of the latter, so that as it cools, the metal becomes solidified in the form of a ring-shaped or hollow ingot or casting, the outer surface of whicb has the form of the mold, and the inner surface is more or lcss conical (or if the mold he rotated at a high velocity, the casting will be nearly cylindrical) forming, in fact, a ring-shaped section of tbe paraboloid of revolution which is the form taken by the free surface of a mass of beavy liquid in rapid rotation round a vertical axis. The axis of rotation, instead of being vertical, may, if fonnd more convenient, be inclined or even horizontal, provided that the velocity of rotation of the mold be sufficient to throw tho liquid metal (when poured into it) into the required annular form.

Improvements in Rolling Steel Rails.

The controversy which has arisen respecting the wisdom of a recent purchase of steel rails in England is taking a practical turn by directing the attention of manufacturers to certain improvements which, if adopted, promise to give to the American product an undoubted superiority, in point of durability, compared with any other. Mr. Wm. A. Jewett, a steel manufacturer of Syracuse, N. Y., says, after speaking of tbe manner in which Eaglish rails are rolled on two high trains:

If your train will stand it, roll your rail until the scale will set, and you will then make better rails than the English. That rails rolled as I direct will and do last longer than those made and finished hotter I am fully convinced, and I am equally sure that tbe reason therefor is the one I have given. I do not believe tbat the English railmakers understand this, and that they continue to use the two high train, and hold back the work for a purpose. I do not believe they know anything about it. * * * Were I a railroad manager, I would have all my rails rolled, for the last three passes in a chilled roll, with grooves polished, and let tbem he rolled so cold that the scale would set. Thus I should hring tbe steel to a condition adapted for tbe longest wear, the safest condition in which it can be left.

Wbatever the value of Mr. Jewett's suggestion, it is certain tbat manufacturere of steel rails in the United Statee will not permit the splendid business just opening to them to suffer loss on account of any superior process now be possession of thsir rivals, or what it may in possiblo for them to deviso.—*American Ship.*

HAY-BURNING COOK STOVES.—M. L. Wood, once a superintendent of ths U. I. & E. road, has inveuted a hay-burning cook stove, to consume the straw and grass of Western prairies. Six pounds of such material will burn 56 minutes and create heat equal to the consuming of 20 pounds of hard coal.

COTTON MANUFACTURE IN THE SOUTH.—It is stated that 183 cotton mills have been built in the South since tho war.

SCIENTIFIC PROGRESS.

A NEW AND IMPORTANT MINERAL.—About the 1st of December of last year, Dr. Henry Wurtz received a specimen of a nowly discovered mineral, said to occur in considerable quantities in Utah, where it ie found in veins of pipe clay. This mineral ie of a dark brown color, and waxy feel, and ie easily impressed by the finger nail. Dr. Wurtz made a preliminary examination, and found that it fuses at a little over 70 degrees C., and evidently consists of a number of homologuee of the paraffine series, such as those found in Europe, in Moldavia and Galicia. It is the first deposit of the kind known on this continent, and may prove of great value to that section of the country. Cold ether dissolves about 12% of a soft paraffine of greasy consistence aud having the color of hurnt sienna. It becomes transparent on melting and reeembles the urpethite of Johnston. Boiling ether dissolves about 37%, and leaves on evaporation a hard, waxy material, somewhat darker than the first portion. It is probably to be classed with ozocerite, notwithstanding its apparently greater hardness. The third portion, insoluble in ether, and comprising about 52% of the original mass, is very dark brown and decidedly harder than bseswax. It appears to approacb in character the Moldavian species of zietriskisite, hut its melting point is somewhat lower. Lack of sufficient material has hitherto prevented Dr. Wurtz from determining the varioue points of interest with satisfactory precision.

THE VELOCITY OF SOUND.—A memoir is published by William W. Jacques, in the February number of the *American Journal of Science and Arts*, on the velocity of very loud sounds. Tbe author gives an account of experiments, made at the United States Arsenal at Watertown, Mass., for the purpose of obtaining automatic measurements of the velocity of sound near a cannon. Behind the cannon—a six-pound brass field-piece—he placed at distances of 10, 30, 50, 90 and 100 feet from its mouth ingeniously-constructed membranes, having an electrical connection with a chrouograph capable of recording .00001 of a second. He found that the velocity of the sound was not greatest at the immediate rear of the cannon, but at eome distance from it, where it rose to a maximum "considerably above the ordinary velocity, and then fell gradually to ahout the velocity usually received." When the cannon was turned at right angles to the line of the series of membranes the distance of the maximum velocity of the sound came nearer the cannon. From these facts the antbor concludes that the velocity of sound is a function of its intensity, and that the experiments upon the velocity of sound in whicb a cannon is used contain an error, probably due to the bodily motion of the air near the cannon. The employment of a musical note of low intensity is, therefore, recommeaded to correctly determine the velocity of sound.

NOTE ON HÆMOCYANINE.—Hæmocyanine is the name given to a new substance obtained from tho blood of tbe devil fish, *Octopus vulgaris.* The liquid portion of tbe blood of tbis animal contains an albuminous liquid snbstance which forms, witb oxygen, a stahle compound of a dark blue color. In vacuo, by contact with living tissue, or when kept in closed vessels, dissociation and generation of oxygen ensue. This substance seems to perform the part of the bæmoglobin in tbe blood of warm-blooded animals. It is evaded with oxygen in the respiratory organs of the animal, carries it through the arterial system into the capillaries and tissues. The venous blood of tbe octopus is colorless, the arterial blood dark blue. These changes of color are tbe consequences of respiration. On laying open the main artery of tbe head, we find the blood circulating through the same to be blue as long as the animal breatbes under water. As soon as takeu out of the water the blood loses its color at once. Hæmocyanine may be easily obtained from the blood hy dialyzing the plasm formed by the blood for three or four days. Hereby the salts and otber diffusible euhstances are removed. Tbe remaining liquor is filtered and evaporated, whereby the hæmocyanine is obtained as a blue, gelatinous mass.—*Comptes Rendus.*

THE *Microscopical Journal* states tbat tbe Johns Hopkins University bas established a summer laboratory for the study of zoology. This laboratory is situated on the Chesapeake bay, and is nnder the charge of W. K. Brooks, wbo bas already shown tbe value of the laboratory in the stndy of marine fauna of that location.

ROCK DRILLING BY ELECTRICITY. — In a recently publisbed work of M. Gaston Plente, "Recherchee anr l'Electricite," noticed in one of our Freuch exchanges, the author mentions a new application of electricity which had not been hitherto published by him, aud which is of considerable interest. After describiug tho proces of engraving on glass by electricity, that hs mads known iu 1877, M. Plante goes on to say: "Ws have seen that one of the electrodes conductiug an electrical current of a certain tension being brought in coutact with glass, in the presence of a saline solution, it acts like a graver or diamond by tracing grooves in the surface of tho glass, and oven digs into it quite decply. In spits of its great hardness, rock crystal can also be attacked by tbe same method; and, if not engraved regularly, it at least cracks into small fragments, and is finally disintegrated." In view of this, M. Plante euggests that tho electric currcut, under coaditions analogous to those above described, might be eubstituted for diamouds in the operation of drilling rocks. Ho states that electrodes of platiuum would not be necessary, for here it is not the metal of the electrode that is affected, but the silicious matter in contact with a ealino solution. Metallic points or projections suitably located at tbe extremity of the drill, isolated on a part of its leagtb and actuated by a rotary movement, would lead the electric current to the surface of the rock to be pulverized, and would thus replace those numerous and expensive diamonds which are set in the head of the drills employed in the present system of rock boring.

SCIENTIFIC VIEWS OF NATURE.—Who does not eeo that Galileo, Descartee, Newton, Lavoisier, Laplace, bave changed the foundation of human thought in modifying totally the idea of the universe and its laws, in substituting for the infantile imaginings of non-scientific ages the notion of an eternal order, in wbicb caprice and particular will have no thought? Have they diminished the universe as some think? For my part I think tbe contrary. The skies as we see them are far superior to that eolid vault epaagled witb shining dots and upborne some leagues above us by pillars whicb contented the simpler ages. I do not mucb regret the little epirits that had wont to guide the planets in their orbits; gravitation does the work much better, and if, at times, I have a sad remembrance of the nine angelic choirs wbeeling round the orbs of the seven planets, and for the crystal sea that lays at the feet of the Eternal, I console myself with the thought that the infinite into which we look is really infinite, and a thousand times more sublime to eyes of true contemplation than all the azure circles of Angelico of Fiesole. M. Thiers rarely allowed a fine night to pass without gazing upon that boundlese eea. "It is my mass," he said. In bow far do the chemist's profound views upon the atom surpass the vague notions of matter on which the scbolastic philosophy was fed!—*Renan.*

THE PHENOMENA OF ANIMAL PHOSPHORESCENCE.—Ray Lankester calls attention to the following suggestive treatment of the phenomenon of phosphorescence in animals by H. N. Moseley: "The light emitted hy phosphorescent animals ie quite possibly, in some instances, to be regarded only as an accidental prodnct, and of no use to the animal producing it, altbougb, of course, in some cases, it has been turncd to account for sexual purposes, and may have other uses occasionally. There ie no reason why a constant emission of heat, sucb as takes place in the case of our own bodies, and it is quite conceivable that animals might exist to which obscure heat rays might he visible and to which men and mammals generally migbt be visible."

PLANT AND ANIMAL LIFE.—A striking analogy between animal and plant life has been diecovered by M. Van der Harrt, of Utrecbt. When the common garden beau begins to sprout, it is found to contain a fermeut very closely resembling pepsin, which can be extracted by means of glycerine. Thie ferment has the power of cbanging albuminous into peptonic substances, and starch into glucose. It is found exclusively in the cotyledons. In tbe case of flesh-eating plants, all the steps of digestion seem to take place in the same manner as in animale.

A NEW THEORY OF THE NATURE OF WATER. M. Maiche, in *Les Mondes*, propounds the theory reached aftcr uumerous experimente tbat water is simply hydrogen *plus* electricity, or oxygen *minus* electricity; or in otber words, tbat normal electrified bydrogen constitutes water, and tbat normal diselectrified oxygen produces the same; or tbat hydrogen, oxygen and water are precisely tbe same, differing only in degree of electrification.—*Scientific American.*

ALLOTROPISM IN METALS.—Mr. Schutzenherger, a Frouch scientist, who has recently paid much attention to the allotropic forms of metals, has now announced that he bas succeeded in obtaining antimony, copper, lead and silver in allotropic forms by precipitating the metals from saline solutions by electrolysis and otherwise.

THE BLUE FLAME FROM COMMON SALT.—Dr. Percy Smith has made a spectroscopical investigatiou of the cause of the blue flame given off hy common salt and other chlorides wben thrown into a hot fire. It is not due to either carbon or sulpbur, but simply to hydrochloric acid.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 15.		Week Ending May 22.		Week Ending May 29.		Week Ending June 5.	
Alpha	17	14	23	18	23½	21½	29½	22¾
Alta	6¾	5¾	8½	7½	8¾	7½	10	8¾
Andes	25c	20c	50c	25c	50c	40c	1.35	50c
Alps	....	....	....	....	....	....	....	....
Argenta	1½	1.10	1.20	70c	1½	90c	1.15	1
Atlantic	....	....	....	....	....	....	25c	....
Aurora Tunnel	....	....	20c	....	30c	20c	....	....
Baltimore Con	....	....	1	50c	....	....	1.35	1
Belcher	5⅝	3¾	6	5	6⅜	5⅛	6¼	5⅜
Belmont	40c	30c	40c	30c	45c	40c	75c	55c
Best & Belcher	14½	12¼	19½	14¾	20½	17¼	22	18⅜
Bullion	4.30	3½	7⅜	4⅝	7½	6¼	8⅜	7½
Bechtel	1	60c	2	1	2.70	1.60	2.40	1.90
Belle Isle	40c	30c	60c	35c	1	65c	1.40	1
Bodie	9¾	9½	17½	12	43	21½	41	36½
Benton	4.40	3.40	5	4.35	5½	4.55	7¾	6
Bulwer	12	10½	11⅞	10¾	13½	11	14¼	11½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.90	1¼	1.80	1.60	2¾	1.60	2¼	2
Belvidere	75c	55c	1	75c	2½	90c	2½	1½
Booker	30c	20c	45c	35c	1	30c	1.05	75c
Caledonia	2	1.20	2.35	2	3	2½	3.30	2¾
California	7½	6⅝	7½	6⅜	7	5¾	7	6½
Challenge	2½	2	2.95	2.60	3	2½	3¼	2
Chollar	5½	4.70	7⅝	6½	9	6⅝	9⅜	7⅞
Confidence	12¾	9	14½	12¼	16	13¼	18⅜	15
Con Imperial	1½	1.05	1.65	1.40	1.70	1.45	2	1.65
Con Virginia	7½	6¾	7⅝	6¼	7	5¾	6⅞	6⅛
Crown Point	4.40	3.60	5½	4.60	6	6	6½	5½
Con Washoe	....	....	....	....	....	....	....	....
Champion	15c	10c	25c	20c	45c	25c	45c	35c
Concordia	10c	....	....	....	....	....	30c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	10c	....
Daney	....	....	....	....	....	....	....	....
Day	55c	40c	70c	60c	60c	50c	1½	50c
Eureka Con	16¾	16	18	17½	18	17	18¾	17¾
Exchequer	4¾	3.65	8½	5⅛	8½	7½	9⅜	8
Endowment	20c	15c	25c	20c	25c	....	40c	30c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3½	3.20	3½	3	3.40	3.10	4½	3.45
Gila	10c	....	20c	15c	20c	15c	75c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	13	14	13	15	13	14	13
Goodshaw	25c	....	40c	25c	80c	50c	80c	65c
Gould & Curry	8¼	6¼	10½	8¾	12¾	9¾	13	11½
Hale & Norcross	12¾	10	15½	13½	18	14½	18½	15½
Hillside	2.15	1¾	2¼	2.20	2	1.90	2¼	2
Highbridge	85c	25c	35c	25c	....	....	35c	30c
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	....	15c	....	15c	10c	15c	10c
Independence	3.10	2.80	2¾	2.60	3	2.80	3.90	3
Julia	3.40	3½	4¼	3.60	4¾	3.70	4¾	4.30
Justice	3½	2½	3.85	3.15	3¾	3.30	4.85	3.80
Jackson	6	....	6	....	6	5½	6	5½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4	3.60	5	4	5½	4½	6	5⅛
Kossuth	....	....	10c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	55c	40c	70c	50c	80c	65c	2	70c
Lady Wash	1.35	1	1.45	1½	1.40	1¼	1.95	1.60
Leopard	1.40	1.15	1.40	1	1	....	1	65c
Leviathan	60c	50c	75c	55c	75c	70c	80c	55c
Leeds	70c	....	75c	60c	80c	70c	75c	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	50c	....
Modoc	....	....	....	....	....	....	1¼	10c
Manhattan	2½	2	2½	2.30	2.40	2½	2.35	2½
Martin White	7	6¾	....	....	6¾	....	6½	....
McClinton	80c	60c	1	60c	1.80	1	1½	1½
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	32	27	37¾	34	43	40	45½	42
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	3	....
North Con Virginia	10	7½	10½	9⅛	10⅞	10	11	9
New York	60c	40c	70c	55c	65c	60c	1	65c
Northern Belle	7½	6¾	7	6¼	6¾	6	7	6⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	10c	20c	15c	25c	15c	50c	25c
Occidental	75c	....	....	....	....	....	60c	50c
Ophir	36½	31½	42	35½	40	37	39½	37½
Oriental	50c	....	90c	50c	95c	60c	65c	....
Overman	8	6½	10	8½	11⅞	8¾	12	10½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	3½	....	3	2½
Phil Sheridan	45c	40c	85c	60c	1	25c	1	75c
Potosi	3½	2	4.90	3½	5½	4.60	6¼	5½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3	2.60	3¼	2¾	4¾	3	6½	4½
Richer	30c	25c	60c	....	....	....	80c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11¾	8½	13½	11½	17	12½	17½	15
Seg Belcher	23	22	27	26	....	....	....	....
Sierra Nevada	45	40	50½	44½	54	47	56¾	51½
Silver Hill	2	1.30	2¾	2.05	2½	2	3	2¾
Silver King	8	....	8¾	8½	....	....	8	7
Silver Prize	....	....	....	....	50c	....	50c	40c
Succor	50c	20c	55c	20c	90c	25c	1	80c
Summit	2	1	2	1½	3	1¾	2½	2
Scorpion	2.55	2	4.10	2.60	3.85	2¾	3¾	3
Solid Silver	25c	....	15c	....	15c	5c	20	10
South Bodie	40c	35c	50c	35c	50c	35c	65c	40c
South Standard	....	....	....	....	....	....	25c	20c
Star	45c	40c	50c	....	50c	35c	60c	25c
St. Louis	....	....	30c	....	....	....	....	....
Syndicate	2¾	2.55	3½	2.90	4½	3¾	4½	3.45
Tioga Con	2.35	2.10	3.30	2.30	4	2.20	3.90	3½
Tiptop	80c	75c	85c	75c	80c	70c	90c	75c
Trojan	25c	5c	30c	20c	35c	25c	40c	25c
Union Con	69	53	77	68½	90	80	97	87
Utah	13½	11½	19¼	14	32	18½	31	24
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.15	50c	1.30	1	1.30	1.10	1½	1½
Wells-Fargo	....	....	5c	....	....	....	30c	25c
Woodville	20c	....	....	....	25c	....	50c	25c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	14½	13	19	15⅞	21¾	17½	21½	20

Sales at S. F. Stock Exchange.

Friday A. M., May 30.

1050 Andes....50@75c
295 Alpha....24@22¾
660 Alta....9@8¾
185 Best & Belcher....22@21½
2310 Bullion....7⅞@7½
1375 Benton....6½@6
605 Belcher....6¼@6
350 Baltimore Con....1@1½
250 Confidence....16@15½
2775 Con Imperial..1.65@1.70
190 California....6½@6¾
440 Con Virginia....6½@6¾
775 Chollar....9¾@9¾
405 Crown Point....6½@6½
500 Cosmopolitan....25c
1110 Challenge....3@3½
1545 Caledonia....3½@3
800 C Dorado....2¾@2.70
690 Exchequer....8⅜@9¼
150 Fairfax....1
2270 Flowery....95c@1
300 Green....1
825 Gould & Curry....12¾@13
415 Hale & Nor....17¾@17¼
645 Justice....3.90@3.80
445 Julia....4.60@4½
120 Kentuck....5¾
2230 Lady Bryan....75@70c
50 Leviathan....75c
930 Lady Wash....1¾@1.60
560 Mexican....42¾@43
1310 Mackey....3¼@2.15
800 Mount View....2@2¼
5665 N Bonanza....2@2.10
1475 New York....65@70c
870 North Con Vir....10¾@11
290 Ophir....39½@39
915 Overman....12@11½
105 Occidental....50c
585 Phil Sheridan....90c@1
660 Potosi....6
340 Savage....16¾@16¼
390 S Potosi....75c
100 Succor....1
305 Sierra Nevada....62@51½
200 Senator....15c
1670 Scorpion....3¾@3.60
930 Silver Hill....2.45@2½
850 Solid Silver....10c
600 Trojan....35@30c
395 Utah....27@27¾
140 Union Con....87@89½
930 Ward....1½@1.30
655 Yellow Jacket..21½@20¾

AFTERNOON SESSION.

970 Argenta....1
500 Adenda....1
1125 Booker....60@75c
495 Bodie....36½@37½
200 Belmont....50c
3885 Belle Isle....1@1¼
350 Bechtel....2.35@2.30
140 Bulwer....11¾@12
2290 Belvidere....1½@1.90
965 Black Hawk....2½@2¾
400 Champion....45@35c
680 C Pacific....4@5
300 Day....50c
1255 Dudley....1.15@1⅛
225 Defiance....1½
70 Endowment....30c
130 Eureka Con....18¾@18½
550 Fourth July....80@75c
1060 Gila....20@15c
130 Grand Prize....3½
1845 Goodshaw....75@65c
600 Golden Terra....14@13½
300 Hussey....10c
300 Hillside....2½@2.15
115 Independence....3
400 Jupiter....85@90c
200 Leopard....75c
500 Modoc....10c
1180 McClinton....1½@1.40
1695 Mono....8@8¾
360 Mammoth....14½@15
10 Martin White....6½
30 Northern Belle....6¾
300 Navajo....25c
150 Noonday....2½@2.60
340 N Noonday....1.10
25 Oriental....65c
500 Orient....20c
65 Phenix....3
700 Red Cloud....65@75c
90 Raymond & Ely....5@5½
650 Star....50@60c
250 Silver Prize....40@45c
250 Summit....2½@2.40
295 Syndicate....3¼@3.45
555 S Bodie....50@45c
3545 S Bulwer....1¾@1.45
100 Silver King....7
1665 Tioga Con....3¾@3.40
50 Tiptop....85c
1650 University....80@85c
600 Vortex....85c

Saturday A. M., May 31.

100 Alpha....23
1750 Andes....85@70c
510 Alta....8¾@9
695 Argenta....1
300 Albion....30c
390 Adenda....90@85c
355 Best & Belcher...19¾@20
660 Bullion....7¾@7½
475 Belcher....5¾@5½
300 Benton....6½@6¾
300 Belmont....60@55c
2445 Belle Isle....1¼@1.40
1205 Bechtel....2.40@2
370 Bodie....38¾@41
105 Bulwer....11¼@12
145 Black Hawk....2.60@2½
1385 Belvidere....1.70@1¾
100 Booker....90@95c
80 Con Virginia....6½@6¼
145 California....6¾
320 Chollar....8@7¾
850 Crown Point....5¾@5⅜
1956 Con Imperial..1.65@1.70
110 Confidence....15½@15
395 Challenge....3@2
590 Caledonia....3@3.05
750 Con Dorado....2.80@3
100 Concordia....30c
200 Champion....35@40c
200 C Pacific....5½@5½
100 DeFrees....10c
100 Day....1½
680 Dudley....1¼@1.15
760 Exchequer....8@8¾
105 Eureka Con....18½@18
300 Endowment....30c
1175 Flowery....1@1¼
500 Fourth of July....60c
235 Gould & Curry...11½@11¼
450 Gila....40c
230 Grand Prize....3½@3.45
470 Goodshaw....65@75c
250 Golden Terra....13
120 Giant & O A....7
1190 H & Norcross....15½@16
565 Hillside....2.15@2¼
150 Highbridge....30@35c
50 Jackson....5¾
380 Justice....3.90@4
585 Julia....4½@4.30
630 Jupiter....75@80c
155 Kentuck....5½@5¼
170 L Wash....1¾@1.80
1945 L Bryan....80@70c
500 Leopard....1
400 Leviathan....70@60c
215 Mexican....42¾@42¾
300 Margarita....15c
100 Mary Ann....25c
250 Mountain View....2@1¾
295 Mackey....2.90@2½
440 McClinton....1½@1.40
375 Mammoth....15@14½
510 Mono....9¼@8¾
600 New York....80@75c
3935 N Bonanza....2¾@2.70
195 N Con Virginia....10@9¾
700 Navajo....30c
500 Noonday....2½@2¾
105 Ophir....38¼@38
350 Overman....10½@10⅜
150 Occidental....60c
440 Potosi....5½
150 Phil Sheridan....80c
50 Phenix....2½
350 Paradise....1.45@1.40
105 Raymond & E....6@6½
170 Real del Monte....2
100 Richer....80c
950 Solid Silver....10c
45 Savage....15¼@15
45 Sierra Nevada....52@52½
500 Succor....95c
66 Silver Hill....2¼@2.35
50 Scorpion....3¼@3.40
650 Syndicate....3½@3.60
300 S Potosi....75c
50 Star....60@55c
660 Summit....2½@2½
1295 S Bulwer....1.65@1.55
100 Standard....10
310 South Bodie....55@65c
640 Tioga....3½
100 Trojan....35c
60 Tiptop....85c
250 Utah....26@24
160 Union Con....90@89½
1030 University....1@90c
150 Vortex....85@90c
1090 Ward....1¼@1.40
100 Wells-Fargo....30c
355 Yellow Jacket....20@20⅜

Monday A. M., June 2.

615 Alta....9½@9⅜
1990 Andes....1@1.35
155 Belcher....5⅝
440 Bullion....7½
290 Best & Belcher..19¾@18½
1325 Benton....6⅛@7
1195 California....6⅜@6¾
5535 Con Imperial....1¾@1.80
165 Confidence....15½@15
355 Challenge....3.10@3
380 Crown Point....5⅜@5½
800 C Dorado....2¾@2.60
860 Con Virginia....6⅜@6¾
330 Chollar....8¾@9
945 Caledonia....3.15@3½
1290 Exchequer....8⅞@8
700 Fairfax....95c@1
1090 Flowery....1@1⅛
185 Gould & Curry...11⅞@11½
590 Hale & Nor....16¾@17½
260 Julia....4½
795 Justice....4.10@4¼
150 Leviathan....65@60c
575 Lady Wash....1⅞@1.80
1260 Lady Bryan....1.70@2
570 Mexican....42@42¼
850 Mackey....2.10@2
200 Mountain View....2¼@2
325 North Con Vir....9@9¾
2085 N Bonanza....2.85@2¾
530 New York....85@80c
545 Ophir....37½@38
125 Overman....11⅓@11¾
150 Potosi....5½
50 Phil Sheridan....90c
1260 Silver Hill....2.70@2½
735 Savage....15½@15¼
150 Succor....90c
245 Sierra Nevada....52
450 Solid Silver....10c
1030 Scorpion....3¼@3
1625 Trojan....35@40c
125 Utah....23@23½
205 Union Con....91@92
800 Wells-Fargo....25@30c
1190 Ward....1⅜@1.30
1180 Yellow Jacket....20½@21

AFTERNOON SESSION.

1200 Adenda....75c@1
1160 Albion....25@30c
2445 Argenta....1.10@1
990 Belmont....60@70c
865 Bodie....40
1670 Bechtel....2.35@2.40
105 Bulwer....13@14½
1900 Belvidere....1.80@2½
1050 Booker....95c@1
1365 Belle Isle....1.40@1.30
595 Black Hawk....2¾@2½
875 C Pacific....7@6¾
500 Champion....40@45c
340 Caledonia (B H)....4½
1470 Dudley....1½@1½
300 Day....60c
105 Eureka Con....18
200 Endowment....40@35c
900 Fourth July....80c
650 Gila....45c
500 Giant & O A....7
820 Grand Prize....4½@4
1750 Goodshaw....80@70c
350 Golden Terra....13½
500 Hussey....10c
250 Hamburg....45@50c
1225 Hillside....2½
50 Highbridge....35c
1500 Independence....3@3.15
25 Jackson....5¾
1725 Jupiter....1¼@1
750 Leopard....75@65c
100 Leeds....75c
110 Mammoth....14½@14
1140 May Belle....35@50c
10 Manhattan....2¼
380 Mono....8⅝@8½
100 Modoc....50c
1565 McClinton....1¼@1.40
20 Northern Belle....7
835 Noonday....2¾@3
110 N Noonday....1
1100 Navajo....50@40c
50 Orient....20c
50 Phenix....3
195 Raymond & Ely....6@6½
630 Red Cloud....75@70c
80 Real del Monte....2¼
150 Star....50c
950 South Standard....20c
350 Silver Prize....50c
1795 S Bulwer....1.70@1½
565 Summit....2¼@2
1815 Syndicate....4@4½
725 Tioga Con....3.80@3.90
225 Tiptop....85@80c
1245 University....95c@1
900 Vortex....85@90c

Tuesday A. M., June 3.

190 Alpha....27@26½
2300 Atlantic....25c
2540 Andes....90c@1.05
1555 Alta....9¾@10
1150 Bullion....8¼@6½
610 Belcher....6@6½
185 Best & Belcher....21½@21
830 Benton....7@7¾
340 Confidence....15½@16
2545 Con Imperial..1.85@1.80
370 Crown Point....5⅝@6
840 California....6⅝@6¾
1000 Con Dorado....2.90@2¾
1000 Cosmopolitan....35c
555 Caledonia....3.30@3.20
200 Challenge....3¼
700 Con Virginia....6⅝@6¾
615 Chollar....9@9⅜
1700 Exchequer....9@9½
400 Fairfax....75c
1430 Flowery....1@1.05
400 Green....1@1.10
635 Gould & Curry....12¼@13
220 H & Norcross....18½@17¾
920 Justice....4⅜@4.85
1300 Julia....4½@4¾
150 Kentuck....5½@6
115 Leviathan....60@55c
280 Lady Wash....1.95@1.90
850 L Bryan....1.30@1½
605 Mackey....2@2.05
400 Mexican....45½@45½
350 Mt View....2@2.10
1745 N Bonanza....2.55@2.60
670 North Con Vir....9@9½
1220 New York....90c@1
220 Overman....12@11¾
625 Ophir....39½@38¾
405 Phil Sheridan....90c
715 Potosi....5⅝@6
650 Pioneer....15c
360 Savage....17½@17¼
370 Succor....90@95c
765 Sierra Nevada....55@56¾
200 Solid Silver....10@15c
830 Scorpion....3¼@3.40
200 Senator....20c
150 S Potosi....75c
1720 Silver Hill....3@2.90
1850 Trojan....35@40c
775 Utah....28½@31
220 Union Con....97@95½
1195 Wells Fargo....25@30c
690 Ward....1.40@1.45
100 Woodville....30@25c
695 Yellow Jacket....20½@21

AFTERNOON SESSION.

700 Addenda....80@75c
1395 Argenta....1½@1.15
400 Albion....30@25c
225 Bodie....37½@38½
575 Bechtel....2.05@2.10
585 Booker....1@1.05
1940 Belmont....60@70c
910 Belvidere....1.90@2
135 Bulwer....13¼@13½
955 Black Hawk....2½@2⅝
3495 Belle Isle....1.20@1
1305 C Pacific....6¾@7
100 Chieftain....10c
490 Champion....40@45c
330 Caledonia (B H)....4¼
885 Dudley....1¼@1
800 Day....55@60c
55 Eureka Con....17¾
50 Endowment....40c
800 Goodshaw....70@65c
400 Grand Prize....4½@4.40
210 Golden Terra....13
150 Gila....50c
415 Hillside....2@2.20
1860 Independence..3.60@3.90
210 Jackson....5¾@5½
575 Jupiter....1.20@1½
420 Leopard....70@65c
955 Mono....8@8½
50 May Belle....50c
515 McClinton....1½@1.40
100 Mammoth....13@12
70 Manhattan....2¼@2.30
250 Northern Belle....7
250 Navajo....45c
1040 Noonday....3
875 N Noonday....1@1.05
600 Orient....20c
230 Paradise....1⅓@1.45
750 Red Cloud....65@60c
220 Raymond & Ely....4½@4½
700 Syndicate....4@4½
540 S Bodie....40@50c
650 S Standard....25c
150 Star....50c
800 Summit....2¼@2.10
2325 S Bulwer....1.30@1⅓
100 Tioga....3¾
250 Tiptop....75c
1050 University....90@75c
800 Vortex....85@90c

Wed'sday A. M., June 4.

95 Alpha....27@26
600 Alta....9½@9¼
3090 Atlantic....25c
1750 Andes....85@70c
625 Benton....6¾@6⅞
250 B & Belcher....21@20¾
240 Baltimore Con....1@1.35
800 Bullion....8@7⅞
305 Belcher....6@5⅞
155 Confidence....15¾@18⅜
185 Crown Point....5¾@5⅜
2460 Con Imperial..1.90@1.85
360 Caledonia....2.80@3
720 Con Dorado....2.80@2¾
1000 Cosmopolitan....35@40c
605 California....7@6¾
415 Con Virginia....6⅝@6¾
220 Chollar....8¾@8⅜
260 Challenge....3¼@3.10
1190 Exchequer....9⅛@9⅜
200 Erie....50c
1060 Flowery....90@75c
490 Gould & Curry...12⅞@12¾
100 Geo Douglas....40c
540 Hale & Nor....17¾@18¼
400 Julia....4.60@4½
240 Justice....4.65
120 Kentuck....5¾@5⅜
910 Lady Bryan....1.10@1¼
410 Lady Wash....1¾@1.95
750 Leviathan....60@70c
575 Mexican....44
275 Mackey....2@2.05
200 Mt View....2@2.10
915 N Bonanza....2.15@2
160 North Con Vir....9@9½
670 New York....90@75c
650 Ophir....37¾@37¼
185 Overman....11½@11¼
100 Phil Sheridan....75@80c
575 Potosi....5¼@6
760 Savage....16½@16
1100 Silver Hill....2¾@2.55
375 Succor....90@80c
70 Solid Silver....15c
50 St Louis....50c
510 Sierra Nevada....55@54½
300 S Potosi....30c
250 Scorpion....3.30@3.35
850 Trojan....35c
240 Utah....29@28
495 Union....91@94¾
495 Ward....1.40
50 Wells-Fargo....25c
200 Woodville....35@40c
565 Yellow Jacket...20½@20⅜

AFTERNOON SESSION.

920 Argenta....1.15
250 Albion....30c
250 Addenda....75c
190 Black Hawk....2@2.10
200 Booker....95c@1
900 Belmont....70@75c
485 Belle Isle....1.20@1½
195 Bodie....40@39½
275 Bulwer....13¾@14
790 Belvidere....1.90@2
1795 Bechtel....2@1.90
400 Champion....40c
645 Con Pacific....6¾@6½
1000 Chieftain....10c
100 Caledonia (B H)....4.20
100 DeFrees....10c
1050 Day....50@55c
970 Dudley....90c@1
200 Defiance....1½
250 Eureka Con....17¾
700 Fourth July....80c
130 Grand Prize....4¼
220 Gila....75c
1070 Goodshaw....65c
100 Golden Terra....13@13½
100 Giant & O A....7
200 Hussey....15c
25 Hamburg....50c
450 Highbridge....30c
250 Hillside....2@2.05
400 Independence...3.55@3¾
40 Jackson....6
2300 Jupiter....90c@1
1025 Leopard....65@80c
50 Leeds....75c
200 Manhattan....2.35
800 Modoc....1¼
390 McClinton....1.30@1.40
1130 Mono....9@9½
200 Mammoth....15
550 Navajo....45@40c
50 Northern Belle....7
1250 Noonday....3
350 N Noonday....1
600 Orient....20c
50 Paradise....1½
320 Raymond & Ely....4½
200 Red Cloud....60@55c
165 Standard....32@32½
500 Star....25@40c
900 Syndicate....4½@4¼
260 Summit....2.10@2
240 S Bodie....50@40c
1180 S Bulwer....1¼@1.40
35 Silver King....8
50 Tiptop....90c
370 Tioga Con....3.60@3½
1335 University....85c
200 Vortex....90c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Bodie G M Co	California	2	1 00	Apr 23	May 30	June 19	Wm H Lent	309 Montgomery st
Booker Con G M Co	California	2	25	Apr 23	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Best & Belcher M Co	Nevada	14	1 00	Apr 17	May 21	June 10	Wm Willis	309 Montgomery st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Crown Point Ravine G & S M Co	Nev	6	15	Apr 16	May 20	June 9	J M Buffington	309 California st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
Trojan M Co	Nevada	10	25	Apr 9	June 2	June 23	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Sierra Nevada S M Co	Nevada	57	2 00	Apr 16	May 20	June 10	W W Stetson	309 Montgomery st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Trojan M Co	Nevada	10	25	April 9	June 2	June 23	David Wilder	328 Montgomery st
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev
Wells Fargo M Co	Nevada	12	25	Apr 23	May 24	June 10	O H Bogart	106 Leidesdorff st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
America M Co	Nevada	1	25	May 9	June 11	June 28	R B Noyes	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 1	Jno Crockett	203 Bush st
Almadeu Q M Co	California	2	25	Apr 15	May 17	June 10	J F Mahoney	207 Sansome st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Champion M Co	California	3	15	Apr 15	June 6	July 7	Jno Crockett	203 Bush st
Cherokee Flat Blue Grav Co	California	41	05	Apr 10	May 12	June 10	R N Van Bruut	318 Pine st
Dudley M Co	California	3	25	Apr 8	May 10	June 9	E C Masten	309 Montgomery st
Eagle S M & M Co	Nevada	13	20	Apr 16	May 20	June 10	Jno E Dixon	327 Pine st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 9	F A McGee	Merchants' Ex
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Hidalgo M & S Co	California	1	01	Mar 29	May 8	June 9	J Costa	323 Front st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Mayflower S M Co	Nevada	1	05	Apr 1	June 6	June 30	J W Pew	310 Pine st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Queen Bee M Co	California	3	10	April 22	May 26	June 16	T A White	113 Leidesdorff st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Seg Europa M Co	Nevada	1	25	Apr 4	June 11	June 28	R B Noyes	240 Montgomery st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Sophia G M Co	California	1	02½	Apr 23	June 5	June 23	L L Blood	Merchants' Ex
South Utah M Co	Nevada	2	10	Apr 7	May 10	May 31	O S Healy	Merchants' Exchange
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Lone Tree G & S M Co		Henry Cluskey	318 Pine st	Annual	June 9
George Douglass M Co	——	W W Bausman	409 California st	Special	June 18
Mitchell G & S M Co	——	A C Hammond	401 California st	Annual	June 17
Vanderbilt M & M Co	——	J Morizio	328 Montgomery st	Annual	June 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., May 29.

270 Alta....8½@8¾
270 Alpha....23½
1145 Andes....40@50c
275 Best & Belcher...20@20¼
905 Belcher....6¼@6⅝
695 Bullion....7½@7¼
765 Benton....5¼@5¼
710 California....6¼@6⅝
1375 Crown Point....6@5¾
245 Con Virginia....6¼@6⅜
745 Chollar....9@8⅞
2385 Con Imperial..1.65@1.70
515 Confidence....15¼@16
555 Caledonia....2¾@3
925 Challenge....3@2.95
1770 C Dorado....2½@2.60
720 Exchequer....8¾@8½
950 Flowery....80c@1
1025 Fairfax....1½
560 Gould & Curry...12¼@12¾
495 Hale & Nor....17¾@18
215 Justice....3.60@3.65
1450 Julia....4½@4¾
375 Kentuck....5@5¼
50 Leviathan....75c
1280 L Bryan....65@70c
50 Lady Wash....1.35
660 Mexican....42¾@43
200 Mt View....2@2.10
1380 Mackey....2.90@3
130 New York....60c
1700 N Bonanza....1.90@2.10
760 N Con Vir....10¾@10⅞
710 Ophir....39½@40
285 Overman....11@11½
550 Potosi....5½@5½
540 Phil Sheridan....80c@1
955 Sierra Nevada....53¾@55
790 Savage....16¼@17
140 Succor....85@90c
615 Silver Hill....2.20@2.30
1725 Scorpion....3¼@3½
200 Solid Silver....10c
1900 Trojan....30@35c
380 Union Con....86@87
845 Utah....28@32
1000 Ward....1.20@1½
960 Yellow Jacket...20½@21¾

AFTERNOON SESSION.

440 Aurora T....25@30c
1825 Argenta....1¼@1.15
350 Belmont....50c
2350 Belle Isle....95c@1
870 Bodie....34@35
1465 Bechtel....2@2.10
535 Bulwer....12½@13
1640 Booker....1@1.10
760 Black Hawk....2¾
3700 Belvidere....1½@2
2845 Champion....35@45c
200 Caledonia (B H)....5
745 C Pacific....3½@4
910 Dudley....1.10@1½
100 Day....50c
120 Eureka Con....18
200 Endowment....30c
1200 Fourth July....65@60c
215 Grand Prize....3.40@3½
225 Golden Terra....14
2325 Goodshaw....70@75c
370 Hillside....2
100 Highbridge....30c
770 Independence....3
65 Jackson....5½@5½
1500 Jupiter....1@1.05
210 Mammoth....12@13
2170 McClinton....1.05@1¼
1610 Mono....6½@7
680 Noonday....2½@2½
400 N Noonday....1.10@1½
300 Navajo....15c
400 Northern Belle....6¾@7
50 Oriental....50c
100 Phenix....3
320 Paradise....1.40
200 Raymond & Ely...4¾@5½
1 0 Real del Monte..2½@2¾
650 Red Cloud....75c
1470 Summit....2.40@2¾
50 Syndicate....3
850 S Bulwer....1@1.10
250 Silver Prize....45c
400 Star....50c
2050 S Bodie....45@50c
100 Tiptop....75c
1420 Tioga Con....2½@2.90
3100 University....70@90c
500 Vortex....85c

Thursd'y A. M., June 5.

195 Alta....9¼
155 Alpha....29@29½
1125 Andes....80@90c
250 Best & Belcher....20½@21
870 Bullion....8⅝@8¾
165 Belcher....5⅝@5¾
360 Benton....6¾@7
180 Confidence....15½@15
120 California....6¾
100 Chollar....8¾
355 Con Virginia....6¾
260 Crown Point....6¾@5⅞
2435 Con Imperial....2
170 Challenge....3.20
560 Caledonia....2¾@2.90
1300 Cosmopolitan....45@40c
1290 Con Dorado....2.80@2
1460 Exchequer....9¾@9⅞
400 Erie....50c
300 Flowery....90c
805 Gould & Curry....12¾
350 Hale & Nor....16@17½
410 Julia....4.60@4.65
1420 Justice....4½@4.05
80 Kentuck....5½
570 Lady Bryan....1.20@1¼
540 Lady Wash....1.80@1.85
450 Leviathan....75@80c
295 Mexican....44
100 Morning Star....3
350 Mt View....2¼@2.10
570 Mackey....2.05@2
450 New York....85@95c
150 N Sierra Nevada....15c
535 North Con Vir....9
640 N Bonanza....2.15@2¼
245 Ophir....37¾@37½
85 Overman....11
180 Potosi....6¼
20 Plutus....1.35
50 Pioneer....20c
55 Savage....16¾@16⅞
245 Sierra Nevada...54¼@54¾
640 Silver Hill....2.70@2.80
200 Senator....20c
1480 Scorpion....3.40@3¾
400 Solid Silver....15@20c
310 Trojan....25@35c
200 Utah....28@28½
20 Union Con....92@91
550 Woodville....40@50c
850 Wells-Fargo....30c
570 Ward....1.35@1½
295 Yellow Jacket...20¾@20½

AFTERNOON SESSION.

785 Argenta....1.10@1.05
550 Albion....30c
500 Adams Hill....5
600 Addenda....75@80c
380 Belmont....70c
120 Bodie....38½@39
280 Bechtel....1¾@1.80
625 Belle Isle....1.15@1½
550 Booker....90@95c
1110 Black Hawk....2@2.05
805 Bulwer....13@12¾
365 Belvidere....1½@1.80
570 Champion....40c
800 Caledonia (BH)....4½@4¾
1000 Chieftain....10c
1000 Crœsus....10c
495 C Pacific....6½@6⅝
1295 Day....55@50c
100 DeFrees....10c
100 Defiance....1½
545 Dudley....90c@1
150 Endowment....30c
140 Eureka Con....17¾
50 Fourth July....80c
425 Grand Prize....4@4½
1300 Gila....65@75c
160 Giant & O A....6¾
950 Goodshaw....60@55c
830 Hillside....2@1.95
650 Hussey....10c
475 Highbridge....30c
555 Independence....3¾@3.85
240 Jackson....5½
1200 Jupiter....95c@1½
1480 Leopard....70@65c
30 Leeds....75c
325 McClinton....1.30@1½
1005 Mono....8½@8¾
950 Modoc....1¼
235 Mammoth....14
10 Martin White....6
10 May Belle....50c
145 Manhattan....2.35@2½
60 Northern Belle....7@6½
2000 Navajo....35c
2000 Noonday....2.90
1875 N Noonday....1
850 Orient....20c
400 Paradise....1½
50 Phenix....2½
230 Raymond & Ely..4¾@4.60
50 Richer....70c
130 Red Cloud....45@60c
490 Summit....2@2½
1150 S Standard....25c
350 S Bodie....40@50c
2615 S Bulwer....1½@1.40
320 Star....40@35c
800 Tiptop....90c
50 Tuscarora....15c
625 Tioga Con....3½
3950 University....70@85c
600 Vortex....95c@1

California Board—Latest Sales.

Wed'sday A. M., June 4.

700 Ætna....30c
40 Alpha....25¾@25½
50 Alta....9¾@9¾
150 Andes....85c
120 Atlantic....35@22½c
40 Belcher....5¾@6
30 Best & Belcher....21½
50 Bullion....7⅞@8
30 California....6¾
50 Con Virginia....6¾
300 Con Imperial...1.85@1.90
40 Crown Point....5¾@5.65
30 Challenge....3.10
140 Caledonia....3¼
40 C Pacific....7
100 Cosmopolitan....35c
200 Coso Con....3@4c
60 Exchequer....9½@9¾
200 Goodshaw....70c
30 Gould & Curry....12¾
20 Hale & Nor....18

60 Julia..........4.65@4.60
30 Justice..........4½
200 Leo..........25c
160 Leviathan..........7½c
150 Lady Bryan..........1.35
40 Mexican..........44
300 Mint..........18@17c
1000 Monumental..........3c
300 N Sierra Nevada.15@12c
50 Ophir..........37½@38½
30 Potosi..........5½
40 Savage..........16½
100 Senator..........35c
60 Silver Jacket..........75c
1250 S Utah..........20@17c
400 S Bodie..........50@53c
400 Silver Prize..........49c
20 Union..........88½
3075 Wales..........1@1½
100 Wells-Fargo..........29c
20 Yellow Jacket..........20½

AFTERNOON SESSION.

50 Alpha..........26½@26½
100 Almaden Q..........30c
10 Andes..........75c
60 Alta..........9½@9½
200 Ætna..........15@25c

30 Belcher..........5½@5½
10 Best & Belcher..........20½
100 Bullion..........8½@8½
130 Caledonia..........2.80
40 Con Virginia..........6½
40 Crown Point..........5½
200 Con Imperial....1½@1.95
30 California..........6½
30 Concordia..........35c
100 Coso Con..........5c
50 C Pacific..........7
550 Cosmopolitan.....42@45c
40 Exchequer..........9½@9½
200 Enterprise..........1½
30 Gould & Curry..........12½
50 Hale & Nor.....18½@15½
40 Julia..........4.65
30 Justice..........4½
20 Mexican..........44½
100 Newark..........20c
750 N Sierra Nevada .15@14c
30 Ophir..........37½
100 Orient..........20c
30 Potosi..........5½
20 Savage..........16½
950 S Utah..........19@21c
200 Wales..........1½
30 Yellow Jacket..........20½

Pacific Board—Latest Sales.

Wed'sday A.M., June 4.

60 Andes..........80c
160 Alta..........9½@10
80 Alpha..........26@27
150 Benton..........7@7½
240 Belcher..........5½@5.95
10 Bodie..........40
100 Best & Belcher...21½@20½
470 Bullion..........8½@8
100 Chollar..........9@8½
10 Con Imperial..........1.88
100 Con Virginia.....6½@6.55
310 California.....6.85@6.95
120 Crown Point.....5½@5.70
60 Caledonia..........2.90
430 Exchequer..........9½@9½
500 Flowery..........75c
105 Gould & Curry....13@12½
100 Hale & Nor.......18@17½
130 Julia..........4 60
350 Justice........4.65@4.55
50 Kentuck..........5½
20 Lady Bryan..........1.35
135 Mexican..........43½@44
170 New York..........85@95c
50 N Bonanza..........2½
240 Ophir..........38½@37½
30 Overman..........11½
185 Savage..........17@16½
140 Scorpion..........3½@3.45
65 Sierra Nevada....54½@55
100 Silver Hill..........2.80
500 Trojan..........35c
50 Utah..........28½@28½
50 Union Con..........94
40 Yellow Jacket..........20½

AFTERNOON SESSION.

120 Andes..........70@75c
30 Bodie..........39½

80 Benton..........6½
50 Bechtel..........2
210 Belcher..........5½@5½
170 Bullion..........8½@8½
120 Crown Point.....5.70@5½
80 Chollar..........8½@9
40 California..........6½
100 Caledonia..........2.90
90 Con Imperial..........1.90
100 Con Virginia..........6½
170 Exchequer..........9½
200 Geo Douglas..........50c
50 Gould & Curry...12½@12½
100 Herald..........50c
40 Justice..........4½
100 M White..........6½
10 Mexican..........44½
20 Mammoth..........16
45 Mono..........9
65 Mackey..........2
20 N Bonanza..........2.15
220 New York.......85@87½c
10 North Con Vir..........9
100 Nob Hill..........45c
500 North Sierra Nev.15@17c
100 Ophir..........37½@37½
20 Overman..........11½
560 Silver Hill.......2.70@2½
700 Solid Silver..........10c
700 Star..........40@50c
70 Savage..........16½@16½
140 Sierra Nevada....55@54½
50 S Bodie..........45c
2050 S Utah..........20@22c
150 Silver Prize..........40c
100 Trojan..........35c
100 Ward..........1.40
1000 W Standard..........1
10 Yellow Jacket..........20½

Mining Share Market.

The stock market continues healthy. Since the inception of the present activity the growing character of the market has steadily developed, till from the present outlook there is every indication of an immediate strong and widespread improvement in affairs. There have been fluctuations, many and violent, but in every case the recession has been followed by reaction, and the net result has been forward. We have again to notice a phenomenon before spoken of, viz., that the wildcats and more worthless stocks are in the lead and much more active than those more legitimately worthy. This is especially to be seen in the Bodies. The present advance may be referred chiefly to two causes, first, the spirit of speculation induced by the increased interest and larger investments of Eastern operators in our favorite stocks; and second, the actual developments made of late in many mines, together with the brilliant prospects held out by many others. Bodie, if not in the lead, has at least divided the honors with the Comstock during the past week. Both fluctuated largely, the one rising generally as the other receded. There is one class of operators who refuse to deal in anything but the Comstocks, and to these is the increase of business in these stocks during the week largely due. Dealers have not yet become wholly confident, but they are wide-awake and thoroughly watchful, and ready to embrace any and every opportunity which may offer a reasonably safe investment.

A Fountain Pen.—The McKinnon fountain pen, a device recently introduced here and which we have used, has a hollow handle in which a supply of ink is carried, and the fluid flows from the point in the act of writing, thus avoiding the necessity of the use of an inkstand. One of the main difficulties in this class of pens heretofore has been to insure a free and certain delivery of the ink, and also to bring the instrument within the size and weight of an ordinary pen. This is a handsome implement and writes smoothly, being somewhat like a lead pencil in this respect. A feature in its construction is that there is no liability of blotting or dropping of ink. It is very easily filled and the supply will ordinarily last for several days. It may be carried in the pocket like a pencil, and is ready for use at any time. The general agency for the Pacific coast is at No. 24 Geary street, also at the Palace and Baldwin hotels, in this city.

Poor, But Gifted.—Two men, under the advice of Mrs. Bowers, the seeress, are digging for coal out on the deserts of Nevada. This lady is able to indicate the locality of mineral bodies; a gift, in her case, connected with two marvels, one of which is that she herself remains miraculously poor.

The Russian bridge over the Volga, now in progress, is to be over four miles long and will cost $3,500,000.

A great increase of European immigration is setting in towards the United States.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Lincoln.—*Ledger*, May 31: The Lincoln mill has temporarily suspended operations. Work in the mine continues. Contracts have been let for running levels, and while the work is progressing it is thought unadvisable to try to keep the mill running. It will probably take till July to get the developments sufficiently ahead to commence crushing rock again.

Miscellaneous.—At the Amador gravel claim, hydraulic operations were started last week, but it was found necessary to shut down, owing to the weakness of the branch ditch. A force is at work repairing and strengthening the water way, and in a few days more the washing process will be resumed. The Keystone last month cleaned up $41,000. It has been decided to have a clean-up twice a month, the amount of bullion being too large to handle in one day. The last clean-up made was for a run of two weeks, and yielded over $10,000, independent of sulphurets. A partial clean-up was made recently on C. D. Horne's gravel claim, at Butte City, which turned out handsomely. The developments in the Gover mine, at New Chicago, have not been so encouraging lately. Another assessment of 50 cents per share has been levied upon the stockholders. The Oneida mill is running only 20 stamps at present. The Consolidated Amador mill is still running on gouge matter from the refuse dumps. A contract for sinking another 100 ft in the new shaft has been let. The new shaft near the Mahoney ground is making rapid progress downwards. The new hoisting machinery lately purchased in New York, is expected soon. It is reported in Sutter that the Wildham mine has been sold to a New York company.

Plymouth Notes.—The Plymouth mill and mine are henceforward to be closed on Sunday. A change in the underground foremanship has taken place. Jackson Little, an old miner in the Phœnix, is now boss. Timbers are coming down the ditch pretty freely now, and soon they will have a good stock on hand again. There is talk of sinking a new shaft south of the Phœnix. A man named Hill is negotiating for the Empire mine at Enterprise; and if suitable terms can be agreed upon with the owner, work will shortly be resumed. Water has been struck in the New London mine, and the workings have come to a standstill in consequence, hand power being too slow a process of getting rid of the water.

CALAVERAS.

Mill Repaired.—*Chronicle*, May 31: The five-stamp battery at the Safe Deposit mine, Old Woman's gulch, formerly the Hoey & Sliter, has been overhauled and thoroughly repaired. The battery is now in condition to do good service, and work will be pushed forward in the mine with renewed vigor. The Safe Deposit, under the superintendency of E. Rigney, Esq., is paying handsomely.

New Mill.—The new 10-stamp quartz mill that for some time past has been in process of construction at the Mount Tmolus mine, Jesus Maria district, is completed. The machinery has been put in motion, and worked first-rate for a first trial.

West Point Items.—*Citizen*, May 31: Everything in the shape of mining is looking very favorable. Mr. Thos. Portcoe and John Roe's quartz mill broke the machinery recently. It came in contact with a quartz boulder of about 1,000 pounds used for a drag that caused the collapse. They had a resort and adopted it immediately. They went to work and cleaned out their arastra and obtained 114 ounces of hard squeezed amalgam, and started for the nearest foundry for repairs. Mr. T. Fenneesy and his partner have been cleaning up lately. Their rock paid $50 per ton.

EL DORADO.

A Good Yield.—*Mountain Democrat*, May 31: Superintendent Chase, of the McClellan mine, Mud Springs township, reports a yield of $1,000 from three and a half days' run on rock from the main shaft.

INYO.

Modock.—Since making connection between shaft and upraise, they have been putting connection drift in shape for bulkhead and connecting with pipe to face of tunnel. They have this work well along, and will commence prospecting as soon as this is finished. Tunnel on 1000 level has been run 50 ft, and is still in fine ground either for ore or progress. The showing for a continuation of the ore body in first stope, 1000 level, is excellent. They have some very high-grade ore standing in this stope, and the prospects for its again opening out are very good. Assays from two pieces from this point yesterday ran $2,200 and $2,800.

Rex Montis.—Messrs. Potter & Ward, of the Rex Montis, after their recent thorough examination and investigation of the company property, have authorized the resumption of active mining and milling operations on a large scale. An order has been given the Black Rock sawmill for supplies of lumber and timbers. A force will be put upon the mines, extracting ore and prospecting. The mill will be run on company or custom ore continually. In the purchase or working of outside ores, the most liberal terms are offered to prospectors and miners for ore of all descriptions that will pay to work. A lot of about 20 tons of fine gold ore has been already purchased for the Fish Springs mine, which will be put through immediately. The reputation of Supt. Holt and foreman Walker for ability and fair dealing in such matters will be sufficient to set many mine owners at work getting out and shipping ore.

Indiana.—Messrs. Boley & Tuttle continue the work of extracting rich ore from their mine near Swansea. Assays made by Mr. Woodhull of the three samples taken from the dump piles showed—No. 1, 1,595 31-100 ounces in silver per ton; No. 2, 770 40-100 ounces, and No. 3, 648 ounces. A shipment of 10 or 12 tons of this class of ore to San Francisco is now being made.

Mines Opposite Independence.—Confidence No. 1 and Confidence No. 2 are the property of the old San Carlos company. A shaft 72 ft deep has been sunk on No. 1. The ledge shows a width of about three ft, the pay streak from 12 to 20 inches. The ore is black, rich looking, copper-stained metal, the assays averaging $72 per ton in silver and from 8% to 10% of lead. Occasional small kidneys of black lead ore have been discovered in the vein matter, which assay as high as $400 per ton. This ledge cuts across the canyon, and its course to the northwest is plainly defined as it ascends the opposite spur of the mountain. Confidence No. 2, or the middle ledge, bears about the same description as to size, but carries much finer ore; it is quartz with black sulphurets of silver. Assays of unselected samples resulted in $70 silver and $8.80 in gold per ton. A tunnel 65 ft in length has been run to tap the ledge a little less distance in depth, and stops about 30 ft short of getting anywhere. The deepest opening is only 18 ft in rich ore at the bottom. The ledge has been stripped 1,200 ft, showing a streak of fine metal every few feet along its surface course. Running along the summit of the hill and parallel with the mines below, is the Bluebird mine, belonging to the same parties. In this the vein of ore is slightly smaller, but the gangue and wall rock appear more favorable and more indicative of a permanent, contact vein. The ore sampled and assayed runs $61. A shaft 20 ft deep exposes ore and well-defined ledge matter to the bottom. All these ledges stand nearly perpendicular, the ore belts cutting through at nearly right angles with the general formation. On top, and so far as they have been opened, these claims certainly look well. About 45 tons of ore stacked up at the several dumps—the richest of which has not yet been tested by assay—attests in itself to their present and probable future value.

New Mill.—Messrs. Phillips & Woolsey have purchased battery, etc., from the old Cervantes mill at Lone Pine, and have the same now on the ground at Crysopolis, for use in the construction of a five-stamp gold and silver mill. Such a concern has come to be a necessity for that side of the river, and mine owners in Union district will not be slow to avail themselves of its advantages. Besides the mines being opened by Messrs. P. & W., the mines of Hopper, Cartier, Densmore and many others, will contribute their quota of rich ore to keep the mill producing bullion.

MONO.

Placer Mining.—*News*, May 27: The "salted" placer mines still hold out, as evidenced by the work being done on Green street, above Wood. Jim Land has had the under-pinning of his house shoveled away by miners, and is now up in the air on stilts, so to speak. The old-fashioned rocker, planted directly in the middle of the road, with an industrious miner constantly at work rocking away, is suggestive of the old days of '49. The men at work, both in sluicing and at the rocker, are doing well; in fact making upwards of $5 per day to the man. There is plenty of gold left in the gravel which covers Silver Hill, and more room left for men who wish to work.

Lucky Jim.—This is the name of a new discovery made on the east slope of Bodie bluff, which promises to exceed in richness anything yet found in the district. Lucky Jim, while strolling over the hills, came upon a formation which he judged sufficiently encouraging in appearance to warrant a little outlay of muscle; he went to work on it and now has a shaft 85 ft deep. It is located 1,000 ft northeast from the Dudley mine, and from the distance followed down shows fine gold interspersed throughout the rock. At the bottom of the shaft a vein two and one-half ft in width has been uncovered, and the indications are that it will widen as depth is attained. The prospect for a mine in this locality is exceedingly encouraging, and adds another proof to the theory of the eastward trend of the ore channel on Bodie bluff.

Red Cloud.—East crosscut on the 400 level is in 312 ft from shaft; progress during the week, 30 ft. Are running for Westchester ledge, which is the extension of the Defiance. Cut the ledge in the shaft at 250 ft, and obtained assays varying from $20 to $43. In 30 days, developments of worth and interest may be looked for in this mine.

Maryland Con.—Work is still being carried on vigorously at this mine, and with most encouraging results. The vein being followed down, is now two and a half ft wide of good ore, with every indication of improving in quality and quantity as distance is attained.

Richer.—Shaft down 250 ft. Have gained a distance of 190 ft in the north drift, and find good ore in fissure, coming in in streaks of from five to ten inches in width, and bearing every appearance of soon consolidating into a fine ore body. About the 15th of June the main shaft will be down to the 300 level, when important developments may be looked for.

Standard Con.—*Standard*, May 29: The north drift from the east crosscut, 385 level, main shaft, has been advanced 10 ft; total length, 210 ft. The ledge is 15 ft wide, of very fine ore. The upraise on this ledge is up 90 ft; progress, 15 ft. The ledge here is four and one-half ft wide, of good ore. The winze on the Cook ledge has been sunk 13 ft during the week; total depth, 97 ft. The ledge in the bottom is two ft wide, of good ore. The west crosscut, 700 level, is in 155 ft; progress, 15 ft. There has been no change to note in the character of the formation passed through. The rock is still very hard. The south drift on the Gildea ledge has been extended 17 ft; total length, 176 ft. The ledge is three ft wide, and looks well. The stopes are all looking very well. In the West Standard, the ledge is 12 ft wide, of very rich ore. Some ore has been stoped from the Gildea. The ledge is three and one-half ft wide, of very fair milling ore. In the stopes, 550 level, south drift, the ledge averages five ft wide, of good ore. In the south drift, 300 level, the ledge is three ft wide. In the north drift, 200 level, the ledge, where stoping is being done, is four ft wide, of good ore. The ledge in the stopes, north drift from main shaft, is four ft wide, and looks well.

Bodie.—The main east crosscut, second level, is in 170 ft. The west crosscut, on the same level, is in 97 ft. The west crosscut, third level, is in 177 ft. West crosscut, same level, 59 ft. Drift No. 1 north, third level, is in 189 ft. Drift No. 2 north, same level, 09 ft. Drift No. 2 south, same level, 47 ft. The two last drifts are on the new vein. Winzes are going down on this vein in both the north and south drifts. An upraise is also being made on this vein, which is now about 50 ft above the drift. The first level in the Bodie mine is 200 ft from the surface in the new shaft; the second level is 306 ft; and the fourth 433 ft.

NEVADA.

The Providence Mine.—*Transcript*, June 1: The prospects of the Providence mine, in this district, are gradually improving. New ore bodies are being opened by the development of an additional series of veins that run in the fissure, which is over 150 ft wide. It has two incline shafts, which have reached a depth of 1,200 ft. There are thousands of ft of ground opened up, and vast quantities of ore in readiness to be transported to the mill. There are stopes on the 600, 800 and 900 levels, from a single one of which six men could take out enough rock regularly to keep the present milling capacity of the company in operation for years. The 600 and 800 levels are nearly 2,000 ft long, showing pay ore the entire length.

Talbot's Gravel Claim.—Talbot's blue gravel claim, at the head of Gold Flat, is looking well. The channel has been prospected for a distance of 200 ft on the line, and is opened up for about 600 ft. Lately some rich nuggets of gold were found on the bedrock. The lead varies from six to ten ft in thickness. It underlies all former workings, and was discovered at a comparatively recent date.

El Capitan Mine.—Work on the El Capitan mine has been progressing favorably. The incline is down 42 ft, and water has been struck, which will delay further sinking until machinery can be erected. In the meantime, the workingmen will be kept busy taking out ore.

Other Notes.—*Foothill Tidings*, May 31: Rube Thomas continues to run his hydraulic claims on the "Slide" day and night, the late rains having kept up the water supply better than he hoped for. Splendid rock is continually coming from the Knight of Malta mine. It took two days to repair a break in the main ditch of the South Yuba canal company which occurred recently near Bear Valley. C. Hersh, a prominent mining expert of San Francisco, has been viewing some of the leading mines in Nevada and Placer counties in the interests of San Francisco capitalists. He is more than satisfied with the outlook. The Blue Tent company and Sailor Flat hydraulic claims at Blue Tent are having an unusually profitable season. D. T. Hughes, Superintendent of the former, says that water is plentiful and the supply will last for some time yet. Moore's Flat is quite dull at the present time, as there are only two mines being worked. The Boston company is the only one running which employs white labor. About 50 men are kept at work in this claim. The other mine being worked is the Chinese claim. A large cave which occurred in the south side of the bank at the Manzanita mine last week, will save the company $1,000 worth of blasting and hydraulicing. M. Oarver, Esq., for some time past Superintendent of the Murchie mine, has resigned his position, said resignation to take effect June 1st.

PLACER.

New Mine and Mill.—*Herald*, May 31: Messrs. Stewart and Low, last summer, commenced running a prospect tunnel into a gravel hill a little over two miles below Auburn. They would occasionally leave their tunnel and prospect more or less on the quartz veins in the same vicinity. In this way they discovered several quartz ledges that prospected well, and on one in particular, the indications were so flattering that they were encouraged to take active steps for its development. They sunk on the ledge some depth, and still finding the rock rich, they went to work to erect a five-stamp mill. This mill was recently completed and is now in operation, and from the best information obtainable, the rock they are running through is very rich. In addition to their quartz mine, they still keep at work on their tunnel, and have just reached the rim of the channel.

More Enterprise.—E. W. Roberts, some years ago Superintendent of the old Auburn quartz mine, on Rock creek, has returned to that district and commenced active operations. He has taken hold of the mine heretofore operated by Heenan and Molin, on Rock creek, and has also put men to work cleaning out the shaft on the old Crandall mine, on Duncan hill, for the purpose of enabling a better examination of the ledge, with the view of bonding or buying it.

SIERRA.

North Fork.—*Mountain Messenger*, May 31: This claim is now paying considerably over expenses, and is about clear of debt. The owners deserve much credit for the tireless perseverance with which they have brought out this mine; and it now bids fair to soon become one of the most remunerative in this section of the country. Present indications are that the quartz ledge may soon yield rich ore. A new air shaft is being constructed. Work is still suspended in the South, but may be resumed in summer.

Bald Mountain Extension.—Watson Bayles is now in nearly 800 ft with the air-line tunnel and the bedrock is so soft that it can be easily broken and pulled down with little effort. It is believed that but little or no hard rock will be encountered in the progress of this risky but promising financial venture. Thus far over $6,000 has been expended on the tunnel. Only 200 ft remain to effect the completion of the present contract.

Kenton.—The prospects of the Kenton quartz mine are daily improving. An extensive body of rich ore is developed and ready for extraction. It is safe to say that over 1,000 tons is now in sight in the mine. The taking out and crushing has now been going on for several weeks, and with highly favorable results. There is sufficient water to run all the machinery, and the expense is consequently light. About 20 skilled miners are now employed at the Kenton, besides a considerable force of other workmen.

TUOLUMNE.

Oroveland.—Cor. *Independent*, May 31: The "Spring mine" is still on the improve. The owners have now drifted into the hill from the ravine, where Barnes' spring is situated, about 30 ft, and are now about 20 ft below the surface of the ground at the end of the drift, where they have made a crosscut to ascertain the width of the vein, which proves to be 10 ft and is composed of alternate layers of partially decomposed yellowish looking quartz and gold-bearing talc slate, dipping at an angle of about 45 degrees to the north. There are no croppings at the surface to indicate the presence of the vein. The ravine below the mine had been very rich, and at an early day had been thoroughly mined up to the point where the vein crosses it, but very little attention had ever been paid to the vein itself, although there had been two or three little holes dug in it a few feet deep; but nothing seems to have been found to encourage farther exploration at that time, and probably would not for many years to come, had not some strangers happened to drift into the village, having a prospect of permanent work at the Mount Jefferson mine or mill. But the mill where they were employed having stopped for want of rock, two of the millmen, after trying several other places without any very marked success, had this place pointed out to them, and finding a small prospect which they thought would justify further research, they located a claim 1,500 ft in length, and commenced in a moderate way to sink and drift upon the vein; as they went down, or further into the hill, the rock seemed to improve, until they began to think it worth while to try some of it in the mill; failing to get the use of the mill they suspended operations for awhile. Work has been recommenced, they have taken out more rock, and finally got the use of the mill and put through about 12 tons; which turned out rather above their expectations. They have been at work ever since developing the mine and taking out rock, and now have quite a large pile upon the dump ready for the mill. Samples from different parts of the mine and the dump were assayed, in every instance splendid results being obtained, ranging from $20 per ton way up into the thousands; and this rock was taken from different places, the whole width of the vein, not less than 10 ft wide.

NEVADA.

WASHOE DISTRICT.

Union Con.—Gold Hill *News*, June 4: The joint Mexican incline winze from the 1000 level has connected with the joint upraise from the 2000 level to meet it, and greatly increased ventilation on both these levels is the result. The main north drift, 2000 level, is making about six feet per day through hard porphyry; total length, 370 ft.

Belcher.—The drift east from the 2700 station is in 50 ft, and in very favorable looking ground. Sinking in the incline has been resumed and it is now 40 ft below the 2760 level. The crosscut, 2500 level, 430 ft south of the incline, is in 60 ft, its face in a good-looking formation of quartz and porphyry.

Con. Virginia.—The west drift, 850 level, is now in 250 ft, and continues in hard, blasting porphyry. The south drift, 1500 level, running west of the old stopes, is in 68 ft from crosscut No. 2. Crosscut No. 1, 1850 level, joint with California, is being advanced as usual through low grade quartz, ventilation having been greatly improved by a fan set up for the purpose.

Alta.—The drifts north and south on the 1750 level are progressing favorably, that south into Alta ground being in 50 ft and that north into Benton 40 ft. Drifting north on the 1450 and 1550 levels, both workings being in quartz.

Sierra Nevada.—The ore stopes on the 2200 level continue to look well and are yielding their 65 tons per day of good ore. The flow of water still averages 125,000 gallons per day.

Sutro Tunnel.—Work is proceeding as usual. The sub-drain will be completed about the middle of July. Mr. Sutro declares, however, that this need make no difference with the mines, as he has contracted to take their water.

Julia Con.—The temperature of the 1300 and 2000 levels have been lowered considerably since the connection between the Hale & Norcross and the Julia branch of the Sutro tunnel. As a consequence, repairs to the workings on the 2000 level are progressing more favorably.

California.—The joint Con. drift west, 850 level, is averaging four and a half ft per day through hard porphyry. The north drift, 1950 level, from No. 3 winze, is in 30 ft. Sinking has been resumed at the C. & C. shaft.

Savage.—The pipe which is to convey the water of the mine to the Sutro tunnel is being sunk and covered to avoid the heat. The water is about at a standstill.

Mexican.—Connection has been made between the joint Union winze from the 1600 level and the upraise from the 2000 level, and the ventilation on these levels has greatly improved in consequence.

Ward.—The shaft has attained a depth of 1,473 ft, the bottom in good sinking ground, which, however, carries considerable water. East crosscut, 800 level, is in 620 ft.

North Bonanza & Flowery.—The incline has reached the 400 level. On the 200 level the north drift has been carried under the Rule winze, and an upraise is to be made from this level to connect with it. Two crosscuts have been run, and will be pushed forward as soon as that in Flowery gets into the vein proper.

Justice.—On the 1550 level the main lateral drift south and the west crosscut are encountering quartz giving increased assays as those workings approach the formation under the developments of the 1300 level. The workings from the new Waller Defeat shaft turn out from 55 to 60 tons of ore per day, of which the greater portion is of high grade.

Con. Imperial.—The north drift, 2600 level, is averaging six ft per day toward the point where the joint Alpha winze from the 2400 level will intersect it; total length, 256 ft, the face in quartz and porphyry.

Ophir.—The incline is 80 ft on the slope below the 2300 station. The face is in a favorable-looking formation containing stringers of quartz. The east drift, 2300 level, is in 70 ft and is passing through vein porphyry.

Trojan.—The northeast drift on the third level is in

Continued on page 372.

On Certain Much-Abused Mollusks.

[By Robert E. C. Stearns.]

In Victor Hugo's very popular novel, *"Les Travailleurs de la Mer,"* the domain of nature being either etale or insufficient, the enterprising author manufactured a new species, a monstrosity, which he invested with characters belonging to widely separate forms of animal etructure. If a hibernicism is permissible, it may be said that he *describes a nondescript*, mixing in an incongruous jumble unrelated peculiarities of different divisions of the animal kingdom.

The average uovel reader whose appetite is aroused by the motion or activity of the narrative, and whose interest is retained by the momeutum as well as by the glamour of Hugo's percussive and explosive verbal pyrotechny, it may be presumed is not sufficiently well informed iu euch matters either to notice, or be offended by, euch trivial crimes against nature.

Hugo connected his invention with the cuttlefishes by calling it *"la pieuvre,"* which is the provincial or local name among the fishermen of the Channel Islande for the eight-footed cuttles (Octopoda) of the region, the "Poulpe" of French authors. Herein lies his offense.

As, eoon after the appearance of this book, Mr. H. Crosse, one of the intelligent and able editors of tbe *Journal de Conchyliologie* (April, 1866), under the title of "Un Mollusque hien maltraite,"* pointed out Hugo'e numerous absurdities and special inaccuracies, there is no necessity for indicating them again; but as we have to notice other sins of a similar nature, if lese heinous, by other sinners, it may be well to quote in part the concluding portion, of Mr. Crosse'e justifiable and pertinent criticism:

"It is * * * the duty of those who have * * * devoted their lives to the study of science to point out and rectify euch gross errors, much more dangerous when they emanate from so eminent a writer as M. Victor Hugo than if they came from an obscure author. We must add that, though this unlucky chapter ie full of every kind of enormity and of facts absolutely false as to science, the paper of Parie which has the largest circulation, although not the most intelligent, has especially selected it as a specimen of the work, and transcribed it at full length with the most fulsome eulogies."

M. Crosse, in closing, ironically adds:

"We see thereby that the instruction of the masses in the natural sciences is in good hands and well directed. M. Michelet, also a confused *litterateur* in regard to science, had already drawn quite an amusing and fanciful portrait of tbe *Poulpe;* but after that eketched by Victor Hugo nothing more can be added. It ie easy enough to make it more accurate; but to frame it more fantastically would be almost an impossibility."

In the *Popular Science Monthly* for January of the current year (p. 345), we have a paper on "The Devil-fish and its Relatives," a chapter from a book† in press at the time, in which Hugo'e sensational name is adopted, and either for padding or piquancy, perhaps both, a part of hie "terribly vivid description" is quoted. The writer adds, as a mild qualification, "Though incorrect in several scientific details, the description is the best we have had, though Jules Verne's is almost as dramatic and nearer to Nature."

The title, and the foregoing extract, brief though it be, is sufficient to indicate to the scientific student or intelligent reader the quality of the article and the probable character of the book. If Verne'e "general description" had been a little more dramatic and a little further from Nature, we may assume that the author would have quoted him instead of Hugo! On a succeeding page (347) we are presented with a sensational picture, "Fig. 2. The Giant Squid," in tbe great double and daring act as the circus folk would expreee it, of clasping a square-ended skiff or boat, while at the eame time thie devilieh fiehy "Giant Squid," uot eatisfied with etealing the man's boat, is actually "going for" the man himself, and had, up to the last time that we look at the picture, already wound or twieted *three* arme around the man'e *two* legs. Such deliberately cruel conduct on the part of this "Giant Squid" indicatee that "The Devil-fish and ite Relativee" are cold-blooded animale, a fact of phyeiological importance; so inferentially we get an occasional chunk of knowledge to pay ue for the time expended. We left the poor man (perhaps a legal voter) in a precarious eituation, probably getting ready to "be *drunk* alive." The picture indicates that drunkenness in eome of its forms was prevalent at the time it wae made, for the proportions of this particularly malicious "devil-fieh" are not thoee of any known epecies, while to point the *tail* (if not the moral) the conventional devil's tail of the "old maetere" is grafted on or in thie unique form, in a way to produce a startling effect on weak nerves.

Will the author pleace inform us what particular epeciee of cuttlefish ie represented in the figure? It is undoubtedly a new form! The disproportionately emall eize of the fins (or tail), the peculiar form of the eame and mode of attachment, prove this to be a new, distinct, and rare epecies. Is it an octopod or a decapod? Though called a "squid," which would warrant the assumption that it hae ten arms, only seven are visible; however, the rest may be in the second cabin! As no one has ever eeen a cephaloped built on such a model, with the posterior portion of the body tapering and attenuated to a point, with a heart-shaped tail stuck on it, euggesting a whaler's bomb-lance, we are forced to the conclusion that Mr. Damon has discovered a new species, which he had better describe, ere the man in the skiff "is *drunk* alive." Before this, however, he should copyright the picture, and get a patent for the tail! On page 349 we are informed that "According to scientific classification, the octopus belongs to the division of soft-bodied *Mollusca*, and the class of *Cephalopoda*—meaning 'feet proceeding from the head.'" Is there a division of hard-bodied mollusca, and do the decapods belong to it? Again, we are iuformed, "Of the Octopoda family is the small paper nautilus or argonaut. How few of our readers who have admired thie beautiful shell, *with its mother-of-pearl lining*" (italics are ours), "have realized that its former inhabitant was own cousin to the horrible devil-fieh." Oh, my! there he goes again, and "poor but respectable" Mrs. Argonaut is defamed and charged indirectly with being a relative to, if not *particeps criminis* with, that apochryphal devil-fish of Hugo's. The *mother-of-pearl lining* in an argonaut shell ie something new. Mr. Damon has invented another epecies, or else he is ignorant of what he has written about. Produce your pearly-lined argonaut, and the dealers and conchological *dilletanti* of Europe aud America will purchase all your specimens at fancy prices.

Tryon, at the closo of his general remarks on the *Cephalopoda*, in his Manual of Conchology, referring to this paper, misquotee the title, but says, "Those who prefer modern marvels will find in it a choice assortment."

If such be popular science, the less of it the better.

In *Harper's Magazine* for February, we have a profusely illustrated article, entitled, "The Treasures of the Deep," in which the artist has done grievous wrong to certain helpless mollusks by making several right-handed or dextral forms, left-handed or sinistral, ae may be seen by turning to page 329, the upper group, which includes what the author calls "Venus' Comb" (*Murex tenuispina* of Lamarck); the second form covered with tubercles known to naturalists as *Murex haustellum* of Linnæus; also the cone-shell *C. nobilis*, the top-shell *Trochus niloticus*, and the shuttle-ehell *Ovula* (*Volva*) *volva*, (not *Ovalum valva*, as printed), are all thus misrepresented.

While certain species of Mollusca—marine, fluviatile and terrestrial—are einistral, the great majority are dextral or right-handed. A few epecies iu each of the three divisions are both dextral and sinistral, but the forms referred to above are always dextral.

As the author, on page 331, compliments "the accomplished artiets who cngravcd these shells and the cut of the uautilus," (more properly *Argonaut*), we may infer that the draughtsman is to blame for these perversions.

Ianthina communis, the violet snail, appears as *Ianthana*, and the author's idea of nacre is not quite lucent, when he tells us the spindle-shell ie "pearly white," and so one gets bit by bit, a scrap of information, until finally the scrap is reduced to a crumb, and the last crumb which we will refer to is that "*Spondylus regius* is probably the rarest shell in the sea," and Dr. Chenu's old story about the learned professor who sold his "wife's jewelry and silver spoons to purchase one of theee rare specimens," is reeurrected, et cetera, to point a moral or to give, as in a previous case, piquancy and padding to the prosy text.

Without guessing at the weight of the paper, we may pass on with the remark, that it is essentially light reading; from pearls to ivory may do, but from Cleopatra to Walrussee we fear will be regarded by readers of classical proclivities, as a new form of that old "etep from the sublime to the ridiculous." Mark Antony, Esq., being deceased, it is probable hie feelinge will not be hurt; were he around as formerly, he would certainly make it lively for the author. Readere of another clase will probably detect a elight top-dreeeing of diluted popular science.

In pursuance of the practical advice given elsewhere to Mr. Damon in relation to his pearly argonaut, we would suggeet that the creator of the sinietral monetroeities, figured in *Harper's*, ehould at once diepoee of his precious epecimens to the museume, where the curioue, whether ecientific or otherwise, may see them. They would command high prices, being undoubtedly unique.

From the monthliee to Webster's big dictionary* may he regarded ae paseing from gay to grave, from lively to eeverc.

Next to the Bible and Koran, mighty in all its massy corpulence and ponderoue dignity, comes the big dictionary! The solemnity of ite phyeiognomy is awful! In some portions of even Christian countries, where the Bible—alae!—ie little ueed, or only a emall-sized edition ie accessible, witnesees are sworn upon this portly tome. Next in potency to a rooeter to force the unwilling Mongolian to the truth, comes the big dictionary, with the myeterious power of its accumulated and concentrated wiedom.

Within the covers of thie awe-inspiring volume we might expect to find ample, unabridged, and impartial juetice. No! Even here certain defeneeleee mollueks are the victime of pictorial infelicities and left-banded compliments.

The *Cephalopods*, eo cruelly used by the otbers, are again badly treated. The definition of the word *Cephalopod* ie well enough eo far as it goes, but for a figure we are presented with the shell of an *Ammonite*. Upon consideration of the fact that the *Ammonites* are an extinct form, without a living representative for numberless centuries, and that the present seas of the globe contain numerous living species and multitudes of individuals of *Cephalopods*,* and that the figure given is wholly irrelevant to the definition; and that while the Ammonites were or are Cephalopods, the latter are by no means *Ammonites* any more than a horse is a mare, the absurdity of the foregoing is at once apparent. While the Ammonite and the Cuttle-fish are properly figured, the unfortunate Cephalopode are needlessly humiliated!

To illuetrate the family of *Entomostomata* we have two figures, viz.: 1. *Ricinula horrida;* 2. *Cancillaria reticulata*. It will be noted that the generic name in the latter is misspelt; it should be *Cancellaria*, as the caucellated sculpture of the ehells suggested the generic name. Both of these well-known dextral or right-handed shells are figured as sinistral; they are aleo presented apex down. When the actual shells are held in the proper position, with the apex up, it will be eeen that the mouth, as the opening is called, opens on the right-hand side.

Helix (4 Zool.), the snail shell, is represented by a revereed *Bulimus* or *Partula*. We should naturally expect to find a typical Helix as figured by some of the old authors, say *H. pomatia*, the snail of the Roman epicures, or *H. aspersa*, also an edible species, largely used in Europe both in ancient and modern times.

Melania aurita (see Melanian), a dextral shell, is made sinistral in the wood-cut, and nothing is said as to whether this numerous and widely dietributed form is marine, fluviatile, or terrestrial.

For *Nautilus* we bave a figure *Argonauta argo* (shell and animal) as stated; while the Argonauta is frequently called the "paper nautilus," the true nautilus shell is internally chambered, as stated in the accompanying definition, and is also nacreous or pearly, while the shell of the *Argonaut* is neither chambered nor pearly. The absurdity of the figure in this connection is made more conspicuous by the note which follows the definition.

Again, it is rather curious that while uuder the definition of *Mollusk* there is given in the group of figuree those of a recent *cephalopod*, as well as the true *Nautilus*, animal and shell (the latter in section, so as to sbow the chambers), also a *Helix*, animal and shell—that such inappropriate figures, to eay the least, should have been placed against each of the above words, as before shown. Ae to the definition of *Nautilus*, it should he said that the ehell is not spiral, but involute and discoidal. The definition of *Paludina*, though brief, is well enough; but the figure of *P. vivipara*, as given, is sinistral, aud the mouth, which in nature is simple, round, and continuoue, is made with a thickened and reflexed peristome.

For Periwinkle we are furnished with what is intended as a portrait of *Littorina littorea*, as stated in the definition (1 Zool.); a dextral shell between tide-marks, but sinistral, with its mouth on the wrong side, when found insido the covere or on the dry land of the dictionary. The large and showy shell, *Triton* (Tritonium now), always dextral, is represented by *T. tritonis* in the reversed figure. The same figure is made to do a double duty, like the chest of drawers in Goldsmith's "Deserted Village." For opposite the term *Trumpet Shell* "tother side" is placed uppermost, and we are told that it is "a univalvular ehell of the form of a trumpet, a species of *Buccinum*." This definition is neither eatisfactory as to the origin of the term, nor in the etatement of its conchological relations. The ancient sculptors and artists placed the shell in the hands of the sea gods, the Tritous, for whom the shell was named,† and who are generally represented with the apex to their lips, blowing the ehell. It ie ueed even now by the natives of eome of the Indo-Pacific islande as a war trumpet. In the early days of conchology, eome of the old authore grouped the geueral form with the *Buccinida*, but has long eince been removed from that poeition.

Againet the word *Turbinated*, we find a speciee of ehell of the group *Turbo*, as an illustration, figured as sinietral; of course in this connection it makee but little difference, a sinistral form illustrating the definition as well ae a dextral; hut not only the epecies reprceented (*T. Marmoratus*), but all of those to which it ie related are dextral ehells. The definition *Univalve* is illuetrated by a speciee of *Triton*; the name attached to it ie "Buccinum undatum," quite a different form.

Scalaria, always a dextral shell in nature, though einietral in the dictionary, is illuetrated by the common European *S. communis*. The popular name for the general form ie *Wentle-trap*. On turning to this word, a definition of which is given, a poor sinistral figure of the large Indo-Pacific epeciee, *Scalaria pretiosa*, is presented for thie well-known dextral shell. Even the common form *Strombus*, ehowy marine shelle, eome epecies of which are notably abundant, hence frequently met with in ordinary collections, and alwaye dextral, is repreeented by a left-handed figure.

Vertigo (2 Zool.). Defined as "a genus of gaeteropodous mollusca witb a cylindrically fusiform ehell." Upon turning to *fusiform*, a word derived from *fusus*, a spindle, we find the definition to be "shaped like a spindle, tapering at each end." The definition is the same as that in conchology. It does not apply to the shells of Vertigo, which are small, stumpy *pupiform* spiral shells, some species being einietral, and othere dextral, with curiously notched or twisted mouths.

We will not at this time prolong our inquiry into the conchological or malacological integrity of this, that, or the other big dictionary. Painful though it may be to point out the weak and human side in so pretentious a ponderosity, it is more painful etill to think of its inhumanity to those helpless forms, which have no Bergh to protect them, and which are also lost sight of by the various societies for the prevention of cruelty to animals! And here wo will close with these appropriate lines from Cowper, which might have been written for the occasion:

> "I would not enter on my list of friends
> (Though graced with polished manners and fine sense,
> Yet wanting sensibility) the man
> Who needlessly sets foot upon a worm.
> An inadvertent step may crush the snail
> That crawls at evening in the public path;
> But he that has humanity, forewarn'd,
> Will tread aside and let the reptile live."

Down the Columbia to the Sea.

The Columbia river is the natural outlet for all the vast region drained by its waters and is destined to be the principal channel of commerce for the immense trade which will come as soon as there is railroad connection between the great river of the West and the Union Pacific railroad. The great advantage which this route presents in its freedom from deep snows and its directness through the center of the country to be traversed more than counterbalances all the disadvantages and difficulties attending the entrance over the bar at the mouth of the river. Since the day that Capt. Gray entered the river with the ship *Columbia*, without a pilot, and without any previous knowledge of the waters he was navigating, thousande of vessels of every description and capacity have crossed the bar coming in and going out at all seasons of the year and in all kinds of weather. That accidente should have somctimes happened to vessels is not surprising, as the same thiug has occurred at the entrance to every port; but it is remarkable that after all that has been said about the difficulties and daugers of this passage, not an inetance is on record where a vessel known to be seaworthy and entering the river in the day time and with a pilot has suffered any serioue accident. Even were the dangers of navigation real instead of being iu a great part imaginary, and the accidents to vessels tenfold what they have been, the river would still continue to bo navigated and its entrance continue to be one of the principal harbors on the Pacific coast. It is very well known that the loss of the *Great Republic*, which, though one of the largest steamers afloat, had so often come in and gone out in perfect safety, was in no way owing to any real danger existing on the bar and in the harbor, but solely to the carelessness of the captain and the pilot in coming in after night. It is perfectly safe to say that with a proper degree of prudence and care on the part of masters of vessels and pilots accidents would be of as rare occurrence at the mouth of the Columbia as at the entrance to any other port.

The people of the Puget Sound country, and those of the upper Columbia basin, are naturally in favor of the route across the Cascade mountains from Priest Rapids on the Columbia to Seattle or some other point on the sound. The advantages and disadvantages of this ronte they will have an opportunity of testing when the Nortb Pacific is completed, as it ie now pretty well settled that that road will be built across the Cascade mountains to the sound.

For the people of southern Idaho and eastern Oregon the route down the Columbia will bs preferred for many reasone, while their interest in the other route to the eea is confined to whatever of favorable competition it may bring.—*Idaho Statesman.*

The Robertson Process.—What is called the Robertson procees of treating rebellious ore ie the invention of John A. Roberteou, of Oakland, Cal. It ie eo simple and uncomplicated that one wonders it wae not thought of before. The Reno *Gazette* saye that W. H. Tredway of that place hae experimented with ores from a number of minee, all of them more or less rebellioue, with uniform euccese. The coet of working ores is trifling and all kinds of ore yield to the same treatment. Mr. Tredway's method is to break the ore up into emall pieces, after which he roaste it in an ordinary portable assay furnace of iron. When it is eufficiently roaeted, it is thrown, hot, into a chemical hath, made by diesolving salt, blueetone and syenite of potaseium in water. The ore ie then washed off with cold water, placed in a miniature pan mill, and ground to a fine pulp, quicksilver being put in to amalgamate the precioue metals. After roasting, the ore ie eoft and brittle, and grinde up easily. The pulp is then panned in an ordinary gold pan, and the amalgam retorted in a simple retort made eepecially for prospector's uee. The erection of a furnace and treating the oree with the chemical bath would be all the changes neceseary in an ordinary stamp mill, for working ores by this procese. Reduction works on the Robertson plan are in euccessful operation in Sacramento, with a capacity for about one ton per hour.—*Silver State.*

*A translation may be found in the *American Journal of Conchology*, Vol. II., pp. 294, 296.

†From "Ocean Wonders," in the press of D. Appleton & Co.

*Webster's Unabridged Pictorial Dictionary, 1876.

*The common squid used as bait by fishermen is abundant on portions of the coast of New England; and the large *Octopus punctatus*, Gabb, is not rare in the fish markets of San Francisco.

†*Vide* "Woodward's Manual."

The Winnemucca and Oregon Railroad

The projected railroad from Winnemucca to Oregon is again attracting attention. Some four years ago Congress granted the right of way through the public domain to this enterprise, and the belief was general that work would he commenced on the road immediately. Subsequently a corps of engineers, under the auspices of the Central Pacific Railroad Company made a preliminiary survey of the route, but for the past two or three years nothing has heen made puhlic relative to the matter. It was predicted at the time when it was said arrangemeuts were completed for the grading of the road, that it would not be built until self-protection compelled the Central Pacific Railroad Company to do it to prevsnt an opposition road from being built from tbs terminus of the Union Pacific west through Idaho to Oregon. That time is now at hand. The Utah Northern railroad, which connects with the Uniou Pacific at Ogden, is heing pushed rapidly, and there is a strong prohahility that that road will he continued west through Idaho to Oregon.

The policy of the Central Pacific Company seems to be to control all railroads running saatward from ths Pacific coast, and to prevent competition from the seaboard with the Union Pacific. The company will thersfore havs to build a hranch line from Winnemucca or some place in this vicinity to the northwest to prsvent tbe Utah Northern, which ie being built by Jay Gould, from continuing that road west through Idaho. Winnemucca is the most northerly point touched hy the Central Pacific road in central Nevada, and is therefore the most eligihle place for the intersection of a road to Oregon. Beeides, there is a beavily timhered region within 200 miles of here on the line of the proposed road, which of itself will be a great inducement to huild the road, as Nevada and Utah must always depend on tbe Sierra Nevada for tbeir lumher supply. Reno will make a determined effort to have the road built north from that point; but as it is about 100 miles south of Winnemucca, its general geographical position is against it, and unless its citizens offer extraordinary inducements in the way of suhscriptions, it will not be likely to secure the coveted prize.—*Silver State.*

Cajon Pass Coal.—There are, at present, two separate companies who are running tunnele on promising veins. The first is composed of Messrs. Lawrence & Tay. They have run a tnnnel into the hill on the east side of tbe road running through the pass, about half a mile north of the toll-house and some hundred feet ahove the road. This tunnel has heen driven ahout 60 feet, following the dip of tbe vein. This was about 45 degrees at the surface, hut is gradnally approaching the horizontal. The hanging wall is saudstone and the foot wall clay, which is regarded as an exceedingly favorahle indication. Although the vein was scarcely more than a trace on the surface, it has steadily widened until it is now over a foot thick. The coal is hard and compact, presents a shining fracture, and seems to he almost free from eulphur. J. S. Bright has tried it in the forge for hlacksmithing purposes and pronounces it to be very good. The company is determined to prosecute work until it shall thoronghly demonstrate the value of the mine. At present their prospects seem to be bright. On the west side of the pass a company, composed of Messrs. Sisemore, Snyder, Bennett and others, have commenced two tunnels. These are three-quarters of a mile farther north thau that on the east side, and have heen run in horizontally, cutting the vein the whole way. The first is in fifteen feet and the other eight feet. This vein dips at an angle of about 70 degrees, and seems to be of as good quality as the other. This company expect to prosecute their prospecting vigorously, and will soon he able to tell definitely what may he expected.—*Colton Semi-Tropic.*

The Utah Northern Railroad.—A writer in the Salt Lake *Tribune*, who has heen contrihuting a seriee of able articles on the "Resources and Attractions of Utah," hae the following to say concerning the railroad which is now advanced to Snake river: The Utah Northern is a protege of the Union Pacific. It is narrow-gauge; starts north from Ogden, runs along the base of the mountaine about 45 miles, crosses a low summit into Cache valley, strikee across eastward to Logan, then north to Franklin, just over the Idaho line; thence it escapee via Marsh creek, and descends the Port Neuf to Snake river. It is now completed to the Eagle Rock crossing of Snake river, ahout 200 miles from Ogden, and will doubtless be continned northward into Montana, and northwestward through Idaho to the mouth of the Columbia. The road was etarted to accommodate the local settlements rather than as a through line; hence its comparative indirectness and the width of ite gauge. It is the only means of access to northern Utah and eouthern Idaho, the banks of whose principal river for 200 miles in length containe gold enough to make placer mining profitable. Snake River valley and the rich silver mines on the head of Salmon river are at present the attraction which fill the eyee of the roving prospectors for mines, and the Utah Northern is sure of a prosperous future. About 80 milee of it are in Utah, and it will he a Utah road etill, when it shall have reached the Pacific with its left and Saskatchewan with its right arm.

Useful Information.

Spontaneous Combustion—Some Remarkable Cases and their Explanation.

M. Cosson recsntly called ths attsntion of the French Academy of Sciencs to a singular accident that had occurred a short time previously in his lahoratory. Eight days sgo, said hs, my lahoratory hecame ths scsne of a sudden outbreak of firo. The board flooring in the neighborhood of a stove spontaneously ignited. In consequencs of a similar accident, two years ago, I had caused tho hoard in the vicinity of the stove to bo replaced by a marhls slah. Notwithstanding this precaution the fire broke out in the wood around the marhle. Ths heat to which tbe wood was exposed at the points where it ignited was not very great; the air had only a temperature of 25°. But without douht there had been a slow carbouization of the wood and a rapid ahsorhtion of the oxygen of tho air, and in consequence a production of caloric sufficient to cause ths combustion. Heroin lies a danger which should he impressed on the minds of architects and huilders.

This reminded M. Faye of a case of spontaneous comhustion that had recently occurred at the houss of a friend of his at Passy. The fire was due to the continuous action of the heat of a stove on the surrounding wood-work.

M. Dumas adduced several analogous examples, all of which he explained by that property of finely divided bodies wherehy they ahsorh air very energetically and generate heat. In powder factorics, for instance, the pulverized carbon very often ignites of itself. It is for this reason tbat the practice has heen generally adopted of pulverizing it in conjunction with eulphur, because sulphnr deprives it of the property mentioned.

In such instances as those cited, tbe wood deprived of its moieture by long exposure to heat becomes transformed into a euhstance analogons to lignite or peat. In fact, it ie changed into a condition that may be compared to that of powdered wood. In this state it condenses the air and takes fire. It wae thue that, on one occaeion in his experience, a beam in a coach-house exposed to hot air took fire spontaneously. Sometimee in theaters the lampman's box, filled with miscellaneous oily rubbish, becomes spontaneously ignited. The greasy odds and ende contained therein condense the oxygen of the air. In manufactories where Adrianople red is applied on cotton impregnated with greasy material, spontaneous comhustion takes place very often.

M. Dumas cited one more singular fact of which he was a witness in the etudio of a painter. The artiet had taken a piece of cotton to hrush and clean his canvas. He gavc the oily eurface a good rubhing and put the cotton aside. Very soon the cotton ignited epontaneously.

The all-sufficient explanation of these and like cases ie the fact that a minutely-divided and air-conducting suhstance has the capahility of producing suddenly a high temperature.—*Exchange.*

To Detect Gas Escaping.—To find the leak, first see that no buruers have heen left accidentally turned on. Thie is often the case where the cock has no stop, and ie caueed by the cock being partially turned around again so as to open the vent. Imperfect stop-cocks for this reason are dangerous, and shonld be promptly repaired. Try all the joints of the gas-fittings, by bringing a lighted match near them, to ignite the escaping gas if any there he. In case it is found by the sense of smell that the gas is escaping either within the floor or walle, do not on any account apply a match near a crevice. Turn off the gas at the meter, and send for a gas-fitter at once. In ordinary leaks, the burner or joint should be unscrewed, and white lead or common bar-soap rubhed in the threads hefore screwing home again.

Stout calico ie made water-proof by the Chinese with a preparation which provee efficient in any climate, and is eupposed to be composed of the following ingredients: Boiled oil, one quart; soft-eoap, one ounce, and beeswax, one ounce, the whole to he boiled until reduced to three-quarters of its quantity when mixed. The calico treated with this mixture answers well for life-saving apparatus.

Salycilic Acid as a Preservative of Water.—A German scientist has preserved drinking water containing much organic matter for three years by adding one grain of salycilic acid to one pint. The water was kept in a stoppered bottle which was opened from time to time, and it tasted perfectly fresh at the end of the three years.—*Amer. Jour. Pharmacy.*

To Prevent Explosions when Casting Lead.—The whole trouble may be stopped by putting a piece of roein, ahout the size of a hickory nnt, into the ladle and allowing it to melt hefore pouring.

To purify rancid butter, work it up with a solution of hi-carbate of soda, chloride of sodium, sugar and tartaric acid. A patent has heen taken out for the process, which it ie claimed will restore the moet rancid hutter.

Starch soaked for a year in a cold saturated solution of common ealt is gradually converted into glucose.

How to Grind Edge Tools.

Edge tools are fitted up hy grinding. The sharp grit of the grindstons, being harder than the iron or steel, euts vsry small channels in the surfaco of ths metal, and the revolving disk carries away all ths minnte particles that are detached hy the grit. If ws were to examine the surface of tbe tool that has just hssu removed from ths grindstone nnder the lens of a powerful microscope, it would appear, as it were, like the rongh surface of a field which has recently been scarified with some implement which formed alternats ridges and furrows. Hence, as thess ridges and furrows ruu together from hoth sides at the cnttiug edge, the newly ground edge seems to hs formed of a system of minnts testh, rather than to consist of a smooth edge. For this reason a tool is first ground on a coarss stone, so as to wsar the surfacs of tbc steel away rapidly; thsn it is polished on a wheel of much finar grit; and finally, in order to reduce the serrature as much as possihls, a whetstons of ths finest grit must be employed. This gives a cutting edge having the smallest possihlc serration. A razor, for example, does not have a perfect cutting edge, as one may perccive hy viewing it through a microscope. Beginners are sometimes instructed, when grinding edge tools, to havs the stone rsvolve toward the cutting edge, and sometimes from it. When the first griuding is heing done, it is a matter of indifference whsther this is done or not; hut when the finishing touches are applied near and at the very edge, a grinder can always complete his task with more accuracy if the periphery of the grindstone revolves toward the cutting edge, as the steel that is worn away will be removed more easily; whereas, when a etone runs in the oppoeite direction, the grinder can not always tell exactly when the side of the tool is fully ground up to the edge. This is more especially true when the steel has a rather low or soft temper. The stone, when running from the edge, will not sweep away every particle of the metal that hangs as a "feather;" hut when the stone revolvee toward the edge, there will he no "feather edge" to deceive the eye of the grinder.—*Cassell's Household Guide.*

Bananas as a material for the manufactnre of alcohol are proposed. It is said that their great cheapness in conntries where tbey are grown and their richness in sugar eminently fit them for this purpose, and that a profitable investment of capital wonld be fonnd in the establishment of alcohol dietilleries in Venezuela and other lands where this fruit is grown in ahundance. Experiments in the manufacture of sugar from the fruit have proved unsuccessfnl. The pulp of the hanana contains, according to analysie of MM. Marcano and Muntz, 8.5% of cane sugar, and 6.4% of grape sugar.

Cement for Cast Iron.—Five parts of sulphur, two parts of graphite, and two parts of fine iron filings are melted together, taking care that the sulphur does not catch fire. The parts, previously warmed, are covered with the cement, reduced to a pasty consistence on a fire, and firmly pressed together. Thie cement, it is said, is very well adapted to fill out leaks in cast iron vessels.

Corks are made both air-tight and water-tight if plunged in melted paraffine, aud kept there for about five miuutes. Thus prepared, they can he easily cut and bored, and may be inserted in, or withdrawn from, hottles witbout any difficulty.

To Clean Silk.—A teaspoonful of powdered horax dissolved in one quart of tepid water is good for cleaning old black dress of silk, cashmere or alpaca.

Good Health.

Worth Remembering.

1. Child two years old has an attack of croup at night. Doctor at a distance. What is to be done?

The ohild should be immediately undressed and put in a warm bath. Then give an emetic composed of one part of antimony wine to two of ipecac. The dose is a teaspoonful. If the antimony is not handy, give warm water, mustard and water, or any other simple emetic; dry the child and wrap it carefully in a warm blanket.

2. Some one's nose bleeds and cannot be etopped.

Take a plug of lint, moisten, dip in equal parts of powdered alum and gum arahic and inseert in the nose. Bathe the forehead in cold water.

3. Child eats a piece of bread on which arsenic has been spread for killing rats.

Give plenty of warm water, new milk in large quantities, gruel and linseed tea; foment the howels. Scrape iron rust off anything, mix with warm water and give in large draughts frequently. Never give large drafts of fluids until those given before have been vomited, hecause the etomach will not contract properly if filled, and the ohject is to get rid of the poison as quickly as possihle.

4. A young lady site in a draft and comes heme with a had sore throat.

Wrap flannel around the throat, keeping out of draft and sudden changes of atmosphere, and every half hour take a pinch of chloride of potash, place it on the tongue and allow it to dissolve in the mouth.

5. Child falls hackwards in a tub of water and is much scalded.

Carsfully undress the child, lay it on a hed, on its hreast if the back is scalded; bs surs all drafts ars excluded; thsn dust ovsr the parts scalded with bi-carhonate of soda; lay muslin ovcr it; then make a tent by placing two hoxes with a board ovcr them in ths bed, to prevent the covering from pressing on the scald; cover up warmly.

Mower cuts driver's legs as he is thrown from seat. Put a tight handags around the limb ahove the cut, slip a cork nndsr it in the direction of a line drawn from ths inner part of the knee to a little outside of the groin. Draw the edges of the cut together with sticking plaster.

6. Child has a bad earache. Dip a plug of cotton wool in olive oil, warm it and place it in the ear. Wrap up ths head aud keep it out of drafts.

A Word to Insurance Officers.—The *Plumber and Sanitary Engineer* suggests to life insurance companies, that instead of marsly hammering at a man's chest to find if he has a tendency to any disease, would it not hs well for the medical sxaminers of lifs insurancs companies to inquire if he has not got a cesspool leaking into his well, or untrappsd pipes beneath his hasins and closets? More persons die of zymotic diseases in New York than from almost any other malady, yst a man living in tbe midst of contagious influences, and hence daily liable to take diphtheria or typhoid fever, would yet find little trouble in getting a heavy policy on his life. If insurance officers would give this suhject their attention they might save many losses to their companies, and also henefit the public generally; for if men found that their homes were rated as "hazardous," they would eoon hegin to think of finding a remedy for the difficulty.

Alum in Bread.—Alum is sometimes used by bakers to make a good-looking loaf from an inferior quality of flour. The danger to health of using it freely has often heen adverted to, and we notice that an eminent English medical authority says that the general use of alum hy hakers is one of the most fertile causes of dyepepsia, liver and bowel complaints in adults, and of debility and rickets in children. Bad teeth and their early decay is another consequence of the daily use of alum in food. It is claimed by physiologists that when there is alum in flour, the bone matter of the bread (phosphate of lime) instead of becoming assimilated by the syetem, is either wholly or in part converted into a salt of alumina, which is useless and incapable of appropriation.

Treatment for Distemper.—It will be interesting to lovers of the canine species to hear of a simple remedy for distemper. At the quarterly meeting of the Scottish Metropolitan Veterinary Medical Society Mr. Baird mentioned the case of a colly dog in the last etage of the disease, and which its owner had determined to destroy. Shortly after being treated with dosee of strong coffee and a little sweet milk, the animal, however, so far recovered as to he ahle to etand and walk. The chairman of the meeting said the case seemed almost unique. —*London Lancet.*

Mr. Robert Rawlinson, in a paper on "Sanitary Science," says: "As the strength of a nation is in the health of the people, it must he the duty of governments to see that means of health are secured to every child born into the world. There is no value apart from human life, and as the poor cannot provide their own dwelling-places, and as experience from the first dawn of history proves that defective tenements produce disease in excess, it must he a prime duty of a government so to legislate, order and regulate that health ehall be possible within the cottage."

A Cure for Poison Oak.—Now that tbe picnic season attracts thousands of people into the country, we reprint tbe following cure for "oak poison," which several persons claim to have used with complete euccess: Dilute sweet spirits of niter with the same quantity of cold water; apply with a white cloth every ten minutes until cured. When of a few houre' contraction it seldom requires more than one application.

Ozone in Relation to Health.—Heretofore ozone has been considered highly conducive to health—that it is an exceedingly healthful principle in the atmosphere, but several scientists have recently taken the opposite view, and seem to he revealing facts which are heginning to startle those who helieve ozone and "ozonized" articles of food or of medicine are quite universally beneficial.

Eucalyptus for Cold in the Head.—A European writer asserts that acute coryza, or cold in the head, is cured in half an hour hy chewiug the leaf of the eucalyptus and slowly swallowing the saliva. Its action is douhtlessly similar to that of cuhehs, which will produce the same effect.

The Empress of Germany offers an international prize for the hest treatise tending to facilitate the cure of diphtheria.

On Certain Much-Abused Mollusks.

[By Robert E. C. Stearns.]

In Victor Hugo's very popular novel, *"Les Travailleurs de la Mer,"* the domain of nature being either stale or insufficient, the enterprising author manufactured a new species, a monstrosity, which he invested with characters belonging to widely separate forms of animal structure. If a hibernicism is permissible, it may be said that he *describes a nondescript*, mixing in an incongruous jumble unrelated peculiarities of different divisions of the animal kingdom.

The average novel reader whose appetite is aroused by the motion or activity of the narrative, and whose interest is retained by the momeutum as well as hy the glamour of Hugo's percussive and explosive verbal pyrotecbny, it may be presumed is not sufficiently well informed iu such matters either to notice, or he offended hy, euch trivial crimes against nature.

Hugo connected his invention with the cuttlefishes by calling it *"la pieuvre,"* whicb is the provincial or local name among the fishermen of the Channel Islands for the eight-footed cuttles (Octopoda) of the region, the "Poulpe" of French authors. Herein liee his offense.

As, soon after the appearance of thie hook, Mr. H. Crosse, one of the intelligent and ahle editore of the *Journal de Conchyliologie* (April, 1866), under the title of "Un Mollusque hien maltraite,"* pointed out Hugo's numerous aheurdities and special inaccuracies, there ie no necessity for indicating them again; but as we have to notice other sins of a similar nature, if less heinous, by other sinners, it may he well to quote in part the concluding portion, of Mr. Crosse'e justifiahle and pertinent criticism:

"It is * * * the duty of those who have * * * devoted their lives to the study of science to point out and rectify euch gross errors, much more dangerous when they emanate from so eminent a writer ae M. Victor Hugo than if they came from an obscure author. We must add that, though this unlucky chapter is full of every kind of enormity and of facts absolutely false as to science, the paper of Paris which has the largest circulation, although not the moet intelligent, has especially selected it as a specimen of tbe work, and transcribed it at full length with the most fulsome eulogies."

M. Crosse, in closing, ironically adds:

"We see therehy that the instruction of tbe masses in the natural sciencee is in good hands and well directed. M. Michelet, also a confused *litterateur* in regard to science, had already drawn quite an amusing and fanciful portrait of tbe *Poulpe;* but after that sketched by Victor Hugo nothing more can he added. It is easy enough to make it more accurate; but to frame it more fantastically would be almost an impossibility."

In the *Popular Science Monthly* for January of the current year (p. 345), we have a paper on "The Devil-fish and its Relatives," a chapter from a book† in press at the time, in which Hugo's sensational name is adopted, and either for padding or piquancy, perhaps hoth, a part of his "terrihly vivid description" is quoted. The writer adds, as a mild qualificatiou, "Though incorrect in several scientific details, the description is the best we have had, though Jules Verne's is almost as dramatic and nearer to Nature."

The title, and the foregoing extract, brief thongh it be, is sufficient to iudicate to tbe scientific student or intelligent reader the quality of the article aud the probable character of the book. If Verne's "general description" had been a little more dramatic and a little further from Nature, we may aseume that the author would have quoted him instead of Hugo! On a succeeding page (347) we are presented with a sensational picture, "Fig. 2. The Giant Squid," in the great double and daring act ae the circus folk would express it, of clasping a square-ended skiff or boat, while at the same time this devilish fishy "Giant Squid," uot satisfied with stealing the man's boat, is actually "going for" the man himself, aud had, up to the last time that we look at the picture, already wound or twisted *three* arms around the man's *two* legs. Such deliherately cruel conduct on the part of this "Giant Squid" indicates that "The Devil-fish and its Relative" are cold-blooded animals, a fact of phyeiological importance; so inferentially we get an occasional chunk of knowledge to pay ue for the time expended. We left the poor man (perhaps a legal voter) in a precarious eituation, probably getting ready to "he *drunk* alive." The picture indicates that drunkenness in some of its forms was prevalent at the time it was made, for the proportions of this particularly malicious "devil-fish" are not those of any known species, while to point the *tail* (if not the moral) the conventional devil's tail of the "old mastere" is grafted on or in this unique form, in a way to produce a startling effect on weak nerves.

Will the author please inform us what particular species of cuttlefish is represented in the figure? It is undoubtedly a new form! The disproportionately small size of the fins (or tail), the peculiar form of the same and mode of attachment, prove this to he a new, distinct, and rare species. Is it an octopod or a decapod? Though called a "squid," which would warrant the assumption that it has ten arms, only seven are visihle; however, the rest may be in the second cabin! As no one has ever seen a cephaloped huilt on such a model, with the posterior portion of the hody tapering and attenuated to a point, witb a heart-shaped tail stuck on it, suggesting a whaler's bomb-lance, we are forced to the conclusion that Mr. Damon has discovered a new species, which he had better describe, ere the man in the skiff "is *drunk* alive." Before this, however, he should copyright the picture, and get a patent for the tail! On page 349 we are informed that "According to scientific claseification, the octopus helongs to the division of soft-bodied *Mollusca*, and the class of *Cephalopoda*—meaning 'feet proceeding from the head.'" Is there a division of hard-hodied mollusca, and do the decapods helong to it? Again, we are informed, "Of the Octopoda family is the small paper nautilus or argonaut. How few of our readers who have admired this heautiful shell, *with its mother-of-pearl lining*" (italics are oure), "have realized that its former inhahitant was own cousin to the borrihle devil-fish." Oh, my! there he goes again, and "poor but respectahle" Mrs. Argonaut is defamed and charged indirectly with heing a relative to, if not *particeps criminis* with, that apochryphal devil-fish of Hugo'e. The *mother-of-pearl lining* in an argonaut shell is eomething new. Mr. Damon has invented another epecies, or else he is ignorant of what he has written ahout. Produce your pearly-lined argonaut, and the dealers and conchological *dilletanti* of Europe aud America will purchase all your epecimene at fancy prices.

Tryon, at the closc of his general remarks on the *Cephalopoda*, in his Manual of Conchology, referring to this paper, misquotes the title, hut says, "Those who prefer modern marvels will find in it a choice assortment."

If such be popular ecience, the less of it the better.

In *Harper's Magazine* for Fehruary, we have a profusely illustrated article, entitled, "The Treasures of the Deep," in which the artist has done grievous wrong to certain helpless mollusks by making eeveral right-handed or dextral forms, left-handed or einistral, as may he seen hy turning to page 329, the upper group, which includes what the author calls "Venue' Comh" (*Murex tenuispina* of Lamarck); the second form covered with tuhercles known to naturalists as *Murex haustellum* of Linnæus; also the cone-shell *C. nobilis*, the top-shell *Trochus niloticus*, and the ehuttle-shell *Ovula* (*Volva*) *volva*, (not *Ovalum valva*, ae printed), are all thus misreprcsented.

Wbile certain species of Mollusca—marine, fluviatile and terrestrial—are einistral, the great majority are dextral or right-handed. A few species iu each of the three divisions are hoth dextral and sinietral, hut the forms referred to above are always dextral.

As the author, on page 331, compliments "the accomplished artists who engraved these shells and the cut of the nautilus," (more properly *Argonaut*), we may infer that the draughteman is to hlame for these perversions.

Ianthina communis, the violet snail, appears as *Ianthana*, and the author's idea of nacre is not quite lucent, when he tells us the epindle-shell is "pearly white," and eo one gets bit by bit, a scrap of information, until finally the scrap is reduced to a crumb, and the last crumb which we will refer to is that "*Spondylus regius* is prohahly the rarest ehell in the sea," and Dr. Chenu's old etory about the learned professor who sold his "wife's jewelry and silver spoons to purchase one of these rare specimens," is resurrected, et cetera, to point a moral or to give, as in a previous case, piquancy and padding to the prosy text.

Without guessing at the weight of the paper, we may pass on with the remark, that it is essentially light reading; from pearls to ivory may do, but from Cleopatra to Walrusses we fear will be regarded by readers of classical proclivities, as a new form of that old "step from the sublime to the ridiculous." Mark Antony, Esq., heing deceased, it is probable his feelings will not be hurt; were he around as formerly, he would certainly make it lively for the author. Readers of another class will probably detect a slight top-dressing of diluted popular science.

In pursuance of the practical advice given elsewhere to Mr. Damon in relation to his pearly argonaut, we would euggest that the creator of the sinistral monetrosities, figured in *Harper's*, ehould at once dispose of his precious specimene to the museums, where the curious, whether scientific or otherwise, may see them. They would command high prices, being undoubtedly unique.

From the monthliee to Webster'e big dictionary* may be regarded as passing from gay to grave, from lively to eeverc.

Next to the Bihle and Koran, mighty in all its massy corpulence and ponderous dignity, comes the big dictionary! The solemnity of its physiognomy is awful! In some portions of even Christian countries, where the Bihle—alas!—is little used, or only a small-sized edition is accessible, witnesses are sworn upon this portly tome. Next in potency to a rooster to force the unwilling Mongolian to the truth, comes the big dictionary, with the mysterious power of its accumulated and concentrated wisdom.

Within the covers of this awe-inspiring volume we might expect to find ample, unabridged, and impartial justice. No! Even here certain defenseless mollusks are the victims of pictorial infelicitiee and left-handed compliments.

The *Cephalopods*, so cruelly used hy the otbers, are again badly treated. The definition of the word *Cephalopod* is well enough so far as it goes, hut for a figure we are presented witb the shell of an *Ammonite*. Upon consideration of the fact that the *Ammonites* are an extinct form, without a living representative for uumberless centuries, and that the present seas of the globe contain numerous living species and multitudes of individuals of *Cephalopods*,* and that the figure given is wholly irrelevant to the definition; and that while the Ammonites were or are Cephalopods, the latter are hy no means *Ammonites* any more than a horse is a mare, the absurdity of the foregoing is at once apparent. While the Ammonite and the Cuttle-fish are properly figured, the unfortunate Cephalopods are needlessly humiliated!

To illustrate the family of *Entomostomata* we have two figures, viz.: 1. *Ricinula horrida;* 2. *Cancillaria reticulata*. It will he noted that the generic name in the latter is misspelt; it should he *Cancellaria*, as the cancellated sculpture of the ehells suggested the generic name. Both of these well-known dextral or right-handed shells are figured as einistral; they are also presented apex down. When the actual shells are held in the proper position, with the apex up, it will he seen that the mouth, as the opening is called, opens on the right-hand eide.

Helix (4 Zool.), the snail ehell, is represented hy a reversed *Bulimus* or *Partula*. We should naturally expect to find a typical Helix as figured by some of the old authors, say *H. pomatia*, the snail of the Romau epicures, or *H. aspersa*, also an edible species, largely used in Europe hoth in ancient and modern times.

Melania aurita (see Melaniau), a dextral shell ie made einistral in the wood-cut, and nothiug ie said as to whether this numerous and widely distrihuted form is marine, fluviatile, or terrestrial.

For *Nautilus* we have a figure *Argonauta arg* (shell and animal) as stated; while the Argonauta is frequently called the "paper nautilus," the true nautilus shell is internally chamhered ae stated in the accompauying definition, and is also nacreous or pearly, while the shell of the *Argonaut* is neither chamhered nor pearly. The absurdity of the figure in this connection is made more conspicuous by the note which follows the definition.

Again, it is rather curious that while unde the definition of *Mollusk* there is given in the group of figures those of a recent *cephalopod*, a well as the true *Nautilus*, animal and shell (th latter in section, so as to show the chambers) also a *Helix*, animal and shell—that such inappropriate figures, to say the least, should have been placed against each of the ahove words, a hefore shown. As to the definition of *Nautilus* it ehould he said that the shell is not spiral, hu involute and discoidal. The definition of *Paludina*, tbough brief, is well euough; but the figure of *P. vivipara*, as given, is sinistral, aud the mouth, wbich in nature is simple, round, and continuous, is made with a thickened and reflexed peristome.

For Periwinkle we are furnished with what i intended as a portrait of *Littorina littorea*, a stated in the definition (1 Zool.); a dextral shel between tide-marks, hut sinistral, with it mouth ou the wrong side, when found iusi the covers or on the dry land of the diction The large and showy shell, *Triton* (Trit now), always dextral, is represented by *T tonis* iu the reversed figure. The same made to do a double duty, like the drawers in Goldsmith's "Descrted For opposite the term *Trumpet* eide" is placed uppermost, and we it is "a univalvular shell of the pet, a species of *Buccinum*." neither satisfactory as to the nor in the statement of its tions. The ancient sculpt the shell in the hands of tons, for whom the ehel are generally represent lips, blowing the shel the natives of some as a war trumpet. chology, some of geueral form wi since been rem

Against the cies of shell of tion, figured as s nection it makes tral form illustratiu dextral; but not only *Marmoratus*), hut all o are dextral shells. Th illustrated by a species of tached to it ie "Buccinum different form.

Scalaria, always a dextral though sinietral in the dictionary, by the common European *S. co* popular name for the general for *trap*. On turning to this word, which is given, a poor sinistra large Indo-Pacific species, *Scu* presented for this well-kno Even the common form *Strom* ehells, eome species of which dant, hence frequently met collections, and alwaye dex hy a left-handed figure.

Vertigo (2 Zool.). Defi gasteropodous mollusca wit form shell." Upon turning to *fusiform*, derived from *fusus*, a spindle, we find the tion to he "shaped like a spindle, tapering end." The definition is the same as conchology. It does not apply to the Vertigo, which are small, stumpy spiral shells, some species heing sinis others dextral, with curiously twisted months.

We will not at this time prolong into the conchological or malacologi of this, that, or the other big diction though it may he to point out the man side in so pretentioue a por more painful still to think of its those helpless forms, which hav protect them, and which are al hy the various societies for th cruelty to animals! And her with these appropriate lines fro might have heen written for t

"I would not enter on my list
(Though graced with polished
Yet wanting sensibility) the n
Who needlessly sets foot upon
An inadvertent step may cru
That crawls at evening in th
But he that has humanity, f
Will tread aside and let the

Down the Columb

The Columbia river is all the vast region drain destined to be the pri merce for the immense as soon as there is railr the great river of the Pacific railroad. The this route presents i snows and its direct the country to he tra balances all the dis atteuding the entra mouth of the river. Gray entered the r without a pilot, knowledge of the thousande of ves capacity have cr going out at all kinds of weather eometimes happe as the same thin to every port; all that has he daugers of this record where and entering a pilot bas s were the da heiug iu a dente to ve the river and its e cipal h well k whi ha s

*A translation may be found in the *American Journal of Conchology*, Vol. II., pp. 294, 296.

†"Ocean World," by D. Appleton & Co.

Webster's Unabridged Pictorial Dictionary, 1876.

*The common squid used as bait on portions of the coast of large *Octopus punctatus*, Gabb, markets of San Francisco.

†*Vide* "Woodward's Manual.

The Winnemucca

The projected rail Oregon is again at four years ago way thro ugh t and th quarely a of the

t of Industrial Success.

joyed reading an articlo hy an sh economist, in a leadiug Ameri- n which great problems of success u a world's trade and industry wers As we proceeded through ths reful analysis of industrial couditions great nations, and drew therefrom ns pointing to ths causes of stagnation ression, we were struck more forcibly r hsfore with the fact that success, and ns of its attainment, are essentially ths whother it be the success of an individual, nation with a population of mauy mil- There is no discovery in this position; ld as it is trus; and yet we ars too prons k upon national prosperity as something lly unlike that of an individual—as a grand from some highsr powsr, and not as a con- ion of affairs affected by the sams class of usss and influencss as those which shape our n lifs successes. And yet thus it is: the ruths of political economy liks other great ruths cover alike the great and ths small in life and action, and hring us to hardship or pros- perity according to our deeds.

It is not our purpose to follow tbe writer in his outline of causes producing the depression which has been felt all over the civilized world. Rather would we take ths hint which the writ- ing implies and draw from general and wide- reaching causes soms special lessons for in- dividual adoption. It is shown that each of the great nations, which are now struggling undsr depressed trads and unrequited industry, bas, during recent years, undertaken some wild and unwise line of expenditure which has been greatsr in cost than the surplus earnings of the country, and has trenchsd upon fixed capital in some manner. Relying upon marks of unusual prosperity, nations have pusbed forward extrav- agant schemes which soou leaped beyond tbe limits of surplus earuings and beyond imme-

OF SAN XAVIER DEL BAC, NEAR TUCSON, ARIZONA.

diate productive needs, and thus have burdens settled down heavily upon the people, repress- ing trads and checking industry. How like the history of many individuals is this chapter from ths life of nations? How many instances do we see on all sides wbere men havs refused to make their actual surpluses some measurs of their new ventures, but rather bavs yieldsd full adherence to enterprises and projects which gratified their fancies or hlinded them with ths illusive hope of some grsat and speedy aggrandizement. Following these splendid visions of easy fortunes hy fortunate stroke rathsr than hy husbanding of labor's rewards, they have horrowed from every lender, and, as their air castles vanished, they find themselvss laden with great weights which they can only dischargs by return to ths old pathway of diligent lahor and self-denying economy. It is a weary work, after one has fed on fancies and dreamcd of no lahor but tbs waving of a magical wand, to return to the toil of the plow, the sledge, or even to the tiring monotony of merchandising. And yet the rs- turn must hs made, and bappy is hs who soonest takss the hint. For years we have besu living in an atmosphere of veuture and great uudcr- takings. Thus our whols industrial life has been tingcd more or less with refracted light, and not illumined with the clear white gleam of labor and its rewards. During the last few years we have been suffering from the collapse of great hollow ideas which inflated our hrains until our skulls seemed nigh to bursting. Now the wrecks of industrial fallacies seem to be clearing away before the returning tide of truth, and there is hope for the return of the good and enduring prosperity of earlier days.

The world's history is a long tribute to the virtaes of industry aud economy, and a warn- ing agaiust their opposites. The experience of this last era when it shall be written, will but strengthen the old truth. It will point the true course to nations and to individuals. It is a hopeful sign for the future of California's in- dustries that the lesson is heing widely learned. The arts of production were never more closely studied than now, for it ie a vital point that wastes shall be stopped and effective work pro- moted. Lst our industries now have their proper place in the minds of ths people. Let the deluding thrall of specious schemes pass away. Let us coms down to the soil, the min- eral, ths metal, assured that though the steps be hard aud the progress slow, ws are in the true path which will lead ns away from the dehris of exploded fallacies into the free open field of houest effort and temperats living. By this sign ws shall conquer; and California will sre long he known, not as the land of great illu- sions, but as ths home of a labor-loving, economi- cal and prosperous people—a land living no longer in the memory of an illustrious past, hut in the realization of a more glorious present, and cherishing the hope of a futurs beyoud anything ws now can know.

* "The Stagnation of Trade, and its Cause," by Prof Bonamy Price, in *North American Review* for June.

Eastern Money and Western Mines.

In so far as such fact can hs supposed to have any significance, ths adoption of a new Consti- tution by ths people of California has not de- terred Eastern capitalists from invssting in our mines. Hardly ever has the business of bny- ing, bonding or otherwise dsaling in these prop- erties heen more active than of late. There is, ns we well know, much idls capital in eastward lying countries. The monsy repositories thsro are repletc with unemployed funds. Investors are casting about for ventures that promise security coupled with a fairly profitable issue. They regard our gold aud silver mines with favor. But thcir sxperience in the mines of the far west has not always been happy. They havs now and again met with financial reverses off this way. So they havs grown a little more chary than at first. They are willing to embark their means freely in mining, hut thsy insist on having properties of merit in rcturn, and in this requirement ws trust there will be no letting up. On this point we hops they will show themselves exacting—inexorable. There are plenty of first-class mines in this country for sals at moderats prices. It is just as easy to obtain a good ons as a poor oue, of wbicb lattsr thers have been too many already palmed off on ths Eastern public.

Among receut transactions of really sterling properties, ws note the sale of ths Taylor Flat hydraulic mines with water franchise, etc., to moneyed men in Indianapolis, United Statss Treasurer New, being ons of the two or three purchasers. This property is situated in Trinity county and is highly spoken of by those acquainted with it. The Buckeye water and hydraulic company, owners of extsnsivs gold- bsaring gravel lands, ditches, water rights, etc., also in Trinity, havs just obtaiued in ths East the large sum of money necessary for extend- ing their main ditch to its principal source of water supply, for finishing the long hedrock tunnel now in progress and otherwiss putting their grounds in good shape for the hsavy and profitable production that awaits a resumption of operations.

Samuel Leet, of Oakland, bas just completsd the sale of a large hydraulic property located on the Forest Hill divide, Placer county, for the sum of half a million dollars, one-fifth of which has been paid down. The buyers resids in the East and bave mads a good purchase. The gravel here is of sxcellsnt quality and great depth. The mins has been opened and equipped, has ample outlst, water supply, etc. The Ward silvsr mine, in the Reese River country, has also changed hands of late, and will hs worked hy Eastern capital. This mine, which liss in ths rich mineral belt that has given distinction to Lander Hill, has a singular history. Having been located at the tims of ths Rsess River ex- citement, it was considered for a while one of the most promising properties in that locality, the croppings carrying ors of an exceeding high grads. These rich surface deposits having bsen hurriedly worked out, the locators abandonsd the claim, which was neglected until recently, when a miner named Thomas Ward took it up, had it recorded and went to work upon it. Aftsr sinking hut a short distance the rich ors cams in again, and following it, the owner, who had not a dollar at the start, has since taksn out enough ore to make him a tolerably rich man. The last lot of ore extracted by him, amounting to 232 tons, yielded at the Man- hattan mill a gross product of $104,000, being an average of more than $400 per ton. The ore hody is shaping for a large deposit, and this is now rsgarded the most promising property on Lander Hill. The new owners havs commenced a deep exploratory and working shaft, and taken other steps looking to systematic and thorough development as well as the extensive benefici- ating of the ores, sucb as the erection of hoisting works, mills, furnaces, etc.

We hear of many other similar sales to par- ties abroad, the details of which we will take pains to collect for early publication, and which tend to show that confidence in the value of mining properties on this coast has not of late suffered impairment in the estimation of Eastern investors. Not only in the purchase of miuing properties does this well-sustained con- fideuce manifest itself, hut also in the purchase of mining shares, many of the orders for which come from the East. Heavy deposits on East- ern account have also been made in our city hanks, these funds to be dishursed in purchase of mining stocks. The shares of several of our more prominent mines, such as the Standard, Bulwer, Bodie, etc., nre meeting with large sale at the New York mining board, wh[illegible] ey [illegible] not only well re[illegible]ived, h[illegible] to [illegible] favorite.

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The Week.

The steadily-increasing excitement in mining shares, the continued encouraging reports of new and extensive finds, and the hustle attendant on the cleaning up and closing down of so many mines for the season, is awakening redoubled interest in the work, and casting a brighter and more encouraging glow over the whole field of mining interests. In California, Inyo reports fine prospects in the Modoc, and speaks an encouraging word for the once famous Panamint mines; Bodie district is rising in favor so fast that her developments cannot keep pace with the inflation; Nevada and Placer are closing up as necessity compels, and the sound of their picks is gradually giving way to the chink of their bullion. Siskiyou is coming bravely to the front as a mineral producer, and prospectors are largely flocking in upon her.

From Nevada we have the same old promise held out of "splendid indications" in the Comstocks, but as yet we fail to grasp the reality. Oregon is blessed with a new lease of life in the abundance of her recent rains. Conflicting reports come to us from Idaho as to the real value, the actual worth, of the Snake River and other placers. The newspaper factions are about equally divided on the question, one side being bitterly denunciatory and the other as loud in their praise. Evidently these are not "poor-men's" mines, for without use of the costly "plate" machines no profit whatever is obtainable. This may explain the controversy. In Colorado the still discouraging reports from Leadville are more than balanced by the brilliant outlook at Silver Cliff and Ten Mile. Finally, Utah has severely suffered in the destruction of Silver Reef by fire.

THE promised discoveries in electric light seem not to have alarmed the holders of London gas stocks, shares in which have not greatly depreciated nor changed hands of late.

The Robertson Process.

The Robertson process is the latest aspirant for public favor in the metallurgical lins, and is now attracting greet attention, as all such things do at first. Many persons bslisvs in it thoroughly, and think it destined to "create a revolution in the processes of ore reduction," a conventional phrase which has been applied to every process yet attempted which gave ths slightest signs of success. Others again say there is nothing in it whatever; that it does not do what is claimed for it; and that in six months it will only be classed with the numerous failures in the same line of which so many have been chronicled. In order that our readers may know exactly what Mr. Rohertson claims for his process, we give a copy of ths patent, which is worded as follows:

The object of my invention is to perform in a single operation what has required two or three operations, and much time to effect in the process of extracting precious metale from rebellious ores—that is to say, hy thoroughly desulphurizing the ore and bringing the precious metal to a condition to amalgamate freely, aggregating the same, and freeing it entirely from the influence and union with the base metals.

To effect this object I place a vat or receiver of sufficient capacity to hold the ore of the most convenient quantity for a single operation—say one ton—and immerse the same in a quantity of water sufficient to cover it. The required quantity of salt to make a thick brine, or as much as can he held in eolutiou with the same, is then used, adding thereto ahout one-half pound of cyanide of potassium and one-half pound of sulphate of copper, forming a eolution of salt and cyanide of potaseium in the ahove described manner. The ton or other desired quantity of ore is slowly heated to a red heat, and afterward plunged, while red-hot, into the aforesaid solution, the ore being broken up to ahout the same size that it is broken for milling. By hringing the ore in contact with the solution it becomes thoroughly desulphurized.

The entire operation of desulphurizing and disintegrating the quartz and sulphurets is almost instantaneous.

Iron pyrites and sulphurets generally are reduced to a very fine flour or almost impalpahle powder, and the quartz is disintegrated, that it may he readily picked to pieces with the hands, and requires so little ruhbing that it may he readily prepared for amalgamation in an ordinary amalgamating-pan.

The action of the cyanide of potassium, in connection with the sulphate of copper, cleans, hrightens, and immediately prepares the precious metals, for amalgamation with the quicksilver, no matter how fine and impalpable the same may be.

The solution composed of the ahove ingredients, and the manner of treating the ore previous to its being brought in coutact with the same, render the operation of extracting the precious metals from the ore very eimple and effectual, and accomplisb it in a very short time.

The claim allowed by the Patent Office on the process is as follows:

"The process of separating precious metals from the ore by heating the ore to a red heat, and afterward plunging it into a solution of salt, sulphate of copper and cyanide of potassium in ahout the proportions set forth."

There is nothing particularly new in this process except the plunging of the heated ore into the *special* solution named. If heated and plunged into any other suitable solution the patent would be avoided. The dieintegration of rock by throwing it into water or throwing water upon it, is "as old as the hills." When Hannihal crossed the Alps, in the year 218 B. C., we are told by Livy and Polybius, that he "hlasted" his way through difficult passes, by building fires against tbe rocks and then throwing the acid lees or dregs of the soldiers' wine on the heated rocks, thus elacking or disintegrating them, repeating the operation until the passage wae formed. A patent was filed in the United States Patent Office in 1868, on the application and the use of the cyanidee in extracting gold and silver from their ores; and in the same patent there is a clause on the combination of mercury, salt and sulphate of copper. In 1864 a patent was obtained, in which the ore was reduced to a powder, preparatory to separating the metal hy subjecting it, as taken from the quarry, to the action of the heat long enough to drive off the sulphur, when it ie suddenly cooled, while, in a highly heated etate, by being let fall into a vessel containing water, or preferably dilute eulphuric or other acid, whereby it was caused to crack or crumble into atoms. The claims in the process were: 1. The process of treating ores consisting in heating, quenching, grinding and amalgamating. 2. Precipitating the heated ore directly from the kiln into a bath of acidulated liquid previous to the grinding operation.

Again, in 1865, a patent was granted in which ore was subjected to a high heat and then suddenly cooled in an alkaline solution. The ore was again then heated and cooled, and if not eufficiently disintegrated, the operation was repeated. The claim on this patent was, "1st., the application of treating rock or ores while in a heated state with an alkaline solution, for the purpose of partial disintegration, desnlphurization and oxidation of the same." The 2d claim was for re-treating to effect a *complete* disintegration, oxidatiou and desulphurization. Anothsr patent in the same year consists in heating the ore to a high degree and cooling it suddenly in a solution of selt and water, and repeating the process. The claim on this was "the application of treating rock or ores whils in a heated state with a saline solution, for the purpose of disintegration, desulphurization and oxidation of the same."

Other methods of a similar charactsr are described in hooks of refersnce, which we have not space to mention. An application for a patent was made by some gentlcmen in this city in 1874 for a process of reducing ores hy heating them to a red heat and while in that condition plnnging them into a solution of salt and cyanide of potassium. This application was rejected, no patent hsing allowed, as the Patent Offics saw nothing new in the process. Still, Rohertson does the same, simply adding sulphate of copper, and procures ths patent, as this particular solution had not heen patented for the purpose. The persons referred to filed caveats last yeer on an improved solution, and, we are informed, propose to sue Robertson for infringing on their rights. This is their own concern, however, and we know nothing of the merits of the controversy.

The use of salt, eulphate of copper and cyanide of potassium in working ores is common in various ways, and Robertson'e patent covers only his special way of treating the ores in the particular solution.

We simply cite the examples above given to show that the new procese ie not a radical change on those previously tried. Very few of these processes survive that infantile period in which only small samples of ore are treated. Fryer was to "create a revolution," hut didn't. The treatment of copper ores hy marsh gas worked in this city on a small scale, well; but after works costing $60,000 were put up a couple of years ago, the whole thing failed.

The Rohertson process has now reached the more crucial stage, when large quantities require to he treated, and which has eo generally proved fatal to this class of experiments. Having successfully managed the traditional pound of ore, it is now called upon to handle tons. That it cau do this the inventor claims, as some who have witnessed its operatione are prepared to admit. Others, however, and among them very competent judges, give it as their opinion that this process fails when tested on a large scale.

Since the above was written, Mr. Taylor, a miner and metallurgist of large experience and of good professional repute, is out in a letter to the *Alta*, wherein he gives the reeults of his examination into the merits of the Rohertson process, which he pronounces a failure. His statement is to the following purport:

Having sent one pound of Meadow Lake ore to Mr. Rohertson to he tested hy his process, he got a return of ahout $50 per ton, nearly all that was in it. Encouraged by this result, he took to Mr. Rohertson eeveral pounde of the same ore, to have it treated in his presence, which was done, the mode of procedure being essentially as we have described it in the patent. The ore was broken into walnut-sized pieces, heated in a common assay furnace, and dropped into the hath, which it was alleged destroyed all the base metal; all that remained to he doue being to pulverize tbe ore, when the gold would readily amalgamate.

Taking the eamples so treated, Mr. Taylor found it impossible to get from them even a trace of gold, the iron sulphurets remaining nearly in their natural condition. Being dissatisfied with this result, he wrote to Mr. Rohertson, asking him to give him an opportunity to test the process on a larger scale, but as this request received no attention, he concluded the inventor did not desire to have hie plan tried in the manner proposed. In the letter to the *Alta*, Mr. Taylor goee on to explain what he considere the defects of Robertson's method, and gives his own views as to the best methods of treating base ores. With this, however, we have nothing to do, our object being simply to describe the new (?) process, and those of similar character previonsly used.

Mr. Robertson has tested various lots of ores to the eatisfaction of the parties concerned, and those thus convinced of the efficacy of the process will, very properly, try it still further. As far ae the science of the process is concerned, it makes very little difference, provided the results accomplished are satisfactory; and all anyone could say concerning it would not convince those who had been successful with it, that the process was crude, unscientific and useless. Those, however, who have had no opportunity of eeeing ore worked under the proper conditions, in the presence of uninterested psrsons, will continue to doubt Mr. Rohertson'e ability to euccessfully beneficiate rebellious ores, nntil it is done on a eufficiently large scale and with a suitable class of oree, to remove it from the ranks of metallurgical experiments, and successfully placed heyond the reach of criticism.

MECHANICS' FAIR PRIZES.—The Board of Directore of the Mechanics' Institute met on Tuesday and decided that at their next fair, which is to open at the Mechanics' pavilion on the 5th of Angust next, but one prize would be given for the best general exhibit, and several cash prizes for the hest exhibition of flowers, fruits, vegetahles, etc. The season tickets will be of the same description as those used at the last exhibition.

The Manhattan Mine and Its Management.

Tbe holders of the Manhattan mining company's stock are hecoming restive under a policy that calls for assessments where dividends were promised, and, as is generally hslieved, ought to be paid. We have lately recsived a numher of letters, mostly from Eastern sbarsholders, making inquiry about this mine, its menagement, prospects, etc.; the writers explaining that they can get no reliable or at least satisfactory information from official sources. In answer to these inquiries we can only say our knowledge of this mine, its condition, prospects and conduct are general and indefinite, and not hy any means of that full and precise kind that these parties seem to requirs. Ths Manhatten mine, or rether mines, for the company own a numher of distinct lodes, is eituated at Austin, in the Reese River district, Lander county, Nevada. The lodes here, though very narrow and incased in granite, occupy regular fissures. They have a generally north and south trend, lie close together and for the most pert are very rich, the ores heing of the chloride variety ahove, with eulphuret or entimonial ores below the water line. Owing to the narrowness of the lodes, the hardness of tbe country rock and the high prices of lumber, ore extraction here as depth is reached hecomes rather costly. Ore reduction is also expensive, recourse to roasting heing necessary and fuel always dear. High prices, in fact, generally prevail here, the hulk of supplies including lumher, requiring to be imported, and the camp heing nearly a hundred miles from the railroad. Bullion cannot therefore he made as cheaply in this Reese River country as in many other parts of Nevada.

On the other hand, as hefore remarked, tbe ores about Austin are mostly of good quality, very little heing worked that contains hy assay less than $200 to the ton. Most of the ore treated mille that amount. For a series of years the ores handled hy the Manhattan company have yielded at about that rate. Despite heavy current expenditures their profits bave, therefore, heen large; so large, that for a long period they were enahled to and did pay liheral and uninterrupted dividends. Why these dividends have ceased and assessments been suhstituted in their place is not apparent to the outsider. The mines, for all the public knows to the contrary, continue to look well. We are informed of no vein pinching or exhaustion of the ore hodies. The same quantity of ore is being raised and milled now as aforetime, and we do not hear that the ores have grown more rebellious or suffered impoverishment. The legitimate outlaye of the company have not lately heen increased. Cost of lahor and supplies tends constantly to lower figures. The Manhattan management took occasion not long since to congratulate themselves on some savings effected through recourse to the trihute system for extracting their ores. Not rightly should outgoes be any larger with them now than they were last year or the year before. They ehould be less. Will they explain then how it ie that they are unable now to make net earnings, as formerly? We mean, explain this in a fair and satisfactory way, for the reasons assigned by them can hardly he accepted as either. If they have debts to pay, as they allege, when were these dehts created, and to whom, and for wbat are they due? And why were they not paid before the shares of the company were worked off on purchasers ignorant of their exietence? As for the discount on silver, that is no greater now nor yet so great as in timee past, and forms a very lame excuse for the present failure to make profits from tbe mine.

Are the directore of the Manhattan company quite sure that there is not eomething wrong about this business? Do they know as a matter of fact that there has not been a job put up here to deceive and swindle these complainants? Such things have been done before. The managers of these properties have a habit of engineering them into a prosperity that will enahle large holders to unload their ehares on the public at high figures, and then, through the levying of assessments, bring about such a decline in prices that these shares can be gathered in at mere nominal rates. As a suspicion of any such purpose on the part of these directors, even though nnfounded, would tend to damage their good names, they should hasten to explain just how it is that the Manhattan mine cannot now pay dividends as it did hefore, and more especially how this property, without having heen crippled in its productive capacities or otherwise undergone any deterioration, has heen converted from a self-sustaining, profit-earning institntion into a stipendary on the stockholders.

MINERAL RESOURCES OF JAPAN.—Deposite of petroleum have long been known to exist in Japan, but they were not, until recently, utilized, that people not being able to refine it. Having learned how to prepare it for burning, they have gone extensively into the business and will now be likely to make enough for their own use, thereby somewhat restricting the outlet for the American article. They have also started in to work their gold, eilver and copper mines, which for agee had been much neglected, though they are quite numerous aud with the aid of improved machinery and methods can probably be worked with profit.

Electricity vs. Gas.

A visit to the bnsy establishment nf Messrs. Goss & Adams, 114 Beale street, machinists nnd fonnders, mannfactnrers of the justly renowned "Corlise" engine, disclosed the fact that active preparatinns nre being made to lignt Kearny street by electricity. It was originally inteuded to use n 100-horse power Corliss engine, but now there is serious talk of increasing the capacity all the way from 100 to 500-horse power.

Mr. Adams can demonstrate clearly the oconomy in the nse of the Corliss engine, the saving being at least 12% over that of any nther engine nf the snme capscity. That it takes the lesd in all large manufactories in the Eastern States whore economy is sought, proves its clnima to be just.

Mr. A. states that he put a 300-horse power Corlisa engine in the Savags mino, which kept the water out and consumed nnly 17 cords of wood per day, while snother engine nf ths same capscity iu the same mine consumed from 30 to 40 cords of wood per day, and thcn could not keep the water down. The question of economy is an important one in electric manipulations.

A visit to the Western Electric Light Company nt 412 Market street, found Mr. W. H. Milliken tho engineer in charge. The Gramms machine and Siemens regulator will be nsed to gensrnte electricity. This cnmpany proposes to put 28 puhlio lights on Kearny strest, four to every block. The Jablochkoff light will be nsed — each one of which has a lighting capacity of 1,000 sperm candles—requiring one-horse power for every light. The Siemens regulator will require from four to six-horse power for every 6,000 and 12,000 candle light. Half ground globes, will he used in place of the objectionable opal globes used in Paris. Mr. Milliken declares tbat 10 cents wortb of labor and fuel will produce moro light by electricity than $3 expended in the same direction for gas. Milton S. Latham as President, J. Clem Uhler, Secretary, and S. D. Field, Superintendent of this company, give every assurance to tbe public that success will be attained. Mr. Latham is now in New York making final arrangements for generators, and is negotiating with Edison for the latest improvements.

Mr. Milliken is engaged in perfecting a means of storing electricity, an invention wbich will be made public as soon as the patent, already applied for, is granted.

Mineral Veins and Deposits.

Our attention baving been called to tbe reading of "A Contribution to tbe History of Mineral Veins," by John Artbur Phillips, before the Geological Society of London, at their very recent mesting, of tbs 30tb of April, 1879, we dssm it but fair to our local author, J. S. Phillips, to state that be has published and strennously endeavored to prove the same ideas in his 1st and 2d editions of the "Explorers', Miners' and Metallurgists' Companion" (a book of 672 octavo pages) more than nine years ago.

This author took especial pains to favor tbe idea, above all others, that the deep and consequently very hnt aqueous solutions brought up the minerals wbich were then deposited in the more shallow colder sections nf the veins; and in his 3d editiou, now being slowly passed throngh the press, be has named in the first part of the book, the *very places and facts* of the above contribution to the Geological Society.

Mr. J. S. Phillips is a close observer, and has professionally traveled tbrougbout this western region, as much as but few men, and in addition to the above statements, he also says: "There are *very many* warm springs in these several Western Statea of tbe United States of America, wbicb are depositing the matrices of silica, lime, magnesia, etc., witb small quantities of the ordinary commercial minerals;" and in another "foot note," he extends this notion even still further by saying: Before closing these chapters on mineral veins and deposits, I would record tbe following ideas, which may, some day, be more fully recognized and established:

"Organic matter, in decomposing condition, is generally present in silicic acid and other earthy solutions, which, wben passing down through the veins and pockets, may serve as the very important reagent for simultaneously releasing and precipitating tbe silicia, alumina, lime, potash, etc., with the gold, silver and base minerals upon the dualistic, lamellose aggregations of the veins, and in the above more irregular deposits; in a manner differing only from petrifactions, by tbe equally disseminated weak solutions of organic and inorganic elements, causing the cleaner and more regular quartz-like deposit."

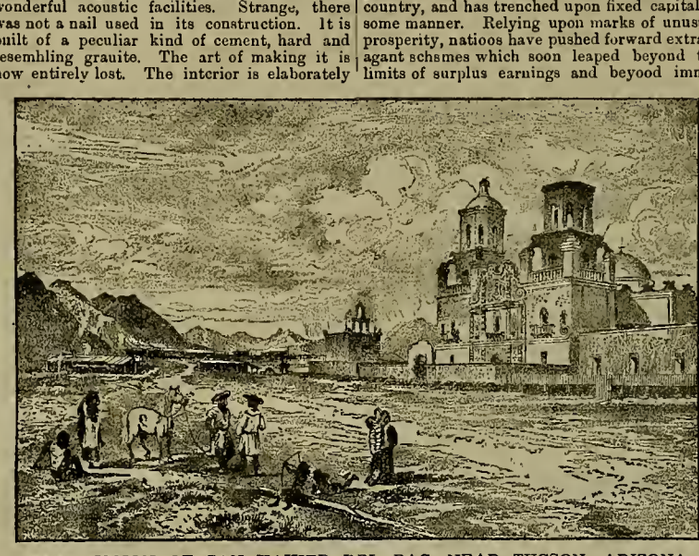
This 3d edition of Mr. Phillips' book is being now printed hy a firm immediately adjoining our own printing office, and we know that these remarks upon the properties named, and such ideas have beeu in print at least six months; and as regard the tbeories, the 1st and 2d editions of the book will show this and many other new theories for itself, and it has been largely circulated, not only here but in England and elsewnere.

Memorial Day was generally celebrated tbroughont the country.

San Xavier del Bac.

The engraving nn this page shows an nld Mission near nne of the oldest towns in the United States, Tucson, Arizona. This interesting relic of the zeal and enterprise of the pedres was photographed by Mr. E. Conklin, and an engraving from the photograph appenrs in his "Picturesqne Arizona," nublished by the "Continent Stereoscopic Co.," of New York city. The Mission is named San Xavier del Bac, snd although nearly 200 years nld, according to Mr. Conklin'a reckoning, it is still in a good state of pressrvatiou, and is npened for religious services to the nativcs, "a half-civilized remnant of a mixture of the Mexico-Indian blood." It is the best preserved Mission ruin in tho Territory, and is one of the boldest of its class in design snd most elaborate in construction. A recent visitor gives a description of the structure, which we reproduco to accompauy the engraving:

Nine miles distant from Tucson, down the vallsy, is the old Mission church of St. Francis Xavier, which is one nf ths greatest objects of interest in the country. It was built about 200 years ago by a community of Franciscans. Compared with a majority of these old churches, it is in a good state of preservation. One of the turrets is gone, but the belfry still stands, in which hang four or five bells in silver cadeuce; the others having been either carried away or stolen. You rcach the belfry by n narrow winding stair, bnilt in the solid wall, the steps worn into deep holes and depressions by ascending and desceudiog footsteps in ycars gone by. The church is cruciform, and is an immeuse edifice, with magnificent arches, nnd with really wonderful acoustic facilities. Strange, there was not a nail used in its construction. It is built of a peculiar kind of cement, hard and resemhling grauite. The art of making it is now entirely lost. The interior is elaborately



THE MISSION OF SAN XAVIER DEL BAC, NEAR TUCSON, ARIZONA.

ornamented; the paintings and colorings upon the walls are still vivid and hright, as though recently executed, and gorgeous in effect. Ths altar-piece and several other pictures are evidently the work of artists, but the others, which are numerous, were done hy pious but not artistic hands. At the end of the transept, high up, midway between the floor and ceiling, is the most ghastly spectacle imaginable. A cross of huge proportions is deeply imbedded in the wall, surrounded by rays of hlack, or dark brown and white. The body once extended upon it has either fallen or heen torn down, leaving one arm, lean and brown as that of a mummy, with bones protruding, nailed to the arm of the cross. It is a spectacle to make one shudder in spite of himself. There are still 75 life-like statues of apostles and saints left staodiug in their nichcs. Upon the faces of some of them the expression is marvelous. Some have fallen down, and otbers are mutilated by time or the irreverent. They all sbow skillful workmanship, and must have been brought by the fathers from Spain. The gilding over and above the main altar is still very heavy and rich. The main altar itself is covered with beaten virgin gold, taken by the monks or their Indian proselytes from tbe mines. The altar service, wbich is also of solid gold, was carried away a few years ago by some priests who came from Mexico for the purpose, and there are but two small vessels left to show what the other and larger pieces must have been. There are still some of the rich vestments left, hut their gorgeous texture is marred by long service and ahuse. The heavy doors are made of solid wood of great thickness, which is joined together in panels hy grooves. The large outer doors were not only made of thick timber, but were covered by tbick sheets of copper, procured from the mines and smelted hy the monks themselves, which, in conjunction with the enormous bar on the inside, make them impervious to any attack from their savage enemy. In connection with the church is the monastery or cloister, and within the surrounding inclosnre is the mortuary chapel—a huge sepulcher, where those who kept their vigils and toiled in a strange, inhospitable land to lead into the paths of peace the henighted nations, rest from their labors and are forgotten.

The Secret of Industrial Success.

We lately enjoyed reading an article by an eminent English economist, in n leading American review,* in which great problems nf success nnd failure in a world's trade and indnstry were discnssed. As we procesded through the writer's careful nnalysis of industrial conditions in all tho great nations, and drew therefrom cnnclusions pointing to ths causes of stagnation and depression, we were struck more forcibly than ever before with the fact that success, and the means of its attainment, are essentially the same, whether it be the success of an individual, or of a nation with a popnlation of many millions. There is no discovery in this position; it is nld as it is true; and yet we are too prone to look upon national prosperity as something wholly uulike that of an individual—as a grand gift from some higher power, and not as a conditiou of affairs affected by the same class of causes and influences as those which shape our own life successes. And yet thus it is: the truths of political ecouomy like othor great truths cover slike the great and the small in life and action, and bring us to hardship or prosperity according to our deeds.

It is not our purpose to follow the writer in his outline of canses producing the depression which has been felt all over the civilized world. Rather would we take the hint which the writing implies and draw from general aud wide-reachiug causes some special lessons for individual adoption. It is shown that each of the great nations, wbich are now struggling under depressed trade and unrequited industry, has, during recent years, undertaksn some wild and unwise line of expenditurs which has been greater in cost than the surplus earnings of the country, and has trenched upon fixed capital in some manner. Relying upon marks of unusual prosperity, natioos have pushed forward extravagant schsmes which soon leaped beyond the limits of surplus earnings and beyood immediate productive needs, and thus have burdens settled down heavily upon the people, repressing trade and checking industry. How like the history of many individuals is this chapter from the life of nations? How many instauces do we see on all sides wbere men have refused to make thoir actual surpluses some measure of their new ventures, but rather bave yielded full adherence to enterprises and projects which gratified their fancies or hlinded them with the illueive hopo of some great and speedy aggrandizement. Following these splendid visions of easy fortunes by fortunate stroke rather than hy busbanding of labor's rewards, tbey have borrowed from every lender, and, as their air castles vanished, they find themselves laden with great weights which they can only discharge by return to the old pathway of diligent labor and self-denying economy. It is a weary work, after one has fed on fancies and dreamed of no labor but tbe waving of a magical wand, to return to tbe toil of the plow, the sledge, or even to the tiring monotony of merchandising. And yet the return must he made, and happy is he who soonest takes the bint. For years we have been living in an atmosphere of veuture and great undortakings. Thus our whole industrial life has been tinged more or less with refracted light, and not illumined witb the clear white gleam of lahor aod its rewards. During the last few years we have been suffering from the collapse of great hollow ideas which inflated our brains until our skulls seemed nigh to bursting. Now the wrecks of industrial fallacies seem to he clearing away before the returning tide of trutb, and there is hope for the return of the good and enduring prosperity of earlier days.

The world's history is a long tribute to the virtues of industry and economy, and a warning against their opposites. The experience of this last era when it shall be written, will bnt strengthen the old truth. It will point the true course to nations and to individuals. It is a hopeful sign for the future of California's industries that the lesson is heing widely learned. The arts of production were never more closely studied thau now, for it is a vital point that wastes sbnll be stopped and effective work promoted. Let nur industries now have their proper place in the minds of the people. Let the deludiug thrall nf specious schemes pass away. Let us come down to the soil, the mineral, the mstal, assured that though the steps be hard aud the progress slow, we ars in the true psth which will lead ns sway from the debris of exploded fallacies into ths free npen field of honest effort and temperats living. By thie sign we shall conquer; nnd California will ere long he known, not as the land of grest illusions, but as tho homo of a labor-loving, economical and prosperous peoplo—a land living no longer in tho memory of nn illustrious past, but in the realization of a moro glorious present, and cherishing the hope of a future beyoud anything we now can know.

* "Ths Stagnation of Trade, and its Cause," by Prof. Bonamy Price, in *North American Review*, for June.

Eastern Money and Western Mines.

In so far as such fact can be supposed to hnve any significsnce, the adoption of a new Constitution by the people of California has not deterred Eastern capitalists from investing in our mines. Hardly ever has the business of bnying, bonding or otherwise dealing in these properties been more active than of lats. There is, as we well know, much idle capital in eastward lying countries. The money repositories thero are replete with unemployed funds. Investors are casting about for ventures that promise security coupled with a fairly profitahls issue. They regard our gold aud silver mines with favor. But their experience in ths mines of the far west has not always been bappy. They havs now and again met with financial reverses off this way. So they have grown a little more chary than at first. They are willing to embark their means freely in mining, but they insist nn having properties of merit in return, and in this requirement we trust there will he no letting up. On this point we hope they will show themselves exacting — inexorable. There are plenty of first-class mines in this country for sale at moderate prices. It is just ns easy tn obtain a good one as a poor oue, of which latter there have been too many already palmed off on the Eastern public.

Among receut transactions of really sterling properties, we note the sale of the Taylnr Flat hydraulic mines with water franchise, etc., to moneyed men in Indianapolis, United States Treasurer New, heing one of the two or three purchasers. This property is situated in Trinity county and is highly spoken nf by those acquainted with it. The Buckeye water and hydraulic company, owners of extensive gold-bearing gravel lands, ditches, water rights, etc., also in Trinity, have just obtaiued in the East the large sum of money necessary for extending their main ditch to its priocipal source of water supply, for finishing tbe long bedrock tunnel now in progress and otherwise putting their grounds in good shape for the heavy nnd profitahle production that awaits a resumption of operations.

Samuel Leet, of Oakland, bas just completsd the sale of a large hydraulic property located on the Forest Hill divide, Placer county, for the sum of half a million dollars, one-fifth of which has been paid down. The buyers reside in the East and bave made a good purchase. The gravel bere is of excellent quality and great depth. The mine has been opcned and equipped, has ample outlst, water supply, etc. Ths Ward silver mine, in the Reese River country, has also cbanged hands of late, and will be worked hy Eastern capital. Tbis mine, which liss in the ricb mineral belt tbat has given distinction to Lander Hill, has a singular history. Having been located at ths time of the Reese River excitement, it was considered for a while one of the most promising properties in that locality, the croppings carrying orc of an exceeding high grade. These rich surface deposits having been hurriedly worked out, the locators ahandoned the claim, which was neglected until recently, when a miner named Tbomas Ward took it up, had it recorded and went to work upon it. After sinking but a short distance the rich ore came in agaiu, and following it, the owner, who had not a dollar at the start, bas since taken out enough ore to make him a tolerably rich man. The last lot of ore extracted by him, amounting to 232 tons, yielded at the Manhattan mill a gross product of $104,000, being an average of more than $400 per ton. The ore body is shaping for a large deposit, and this is now regarded the most promising property on Lander Hill. The new owners bave commenced a deep exploratory and working shaft, and taken other steps looking to systematic and thorough development as well as the extensive beneficiatiog of the ores, such as the erection of hoisting works, mills, furnaces, etc.

We hear of many other similar sales to parties abroad, the details of which we will take pains to collect for early publication, and whicb tend to show that confidence in the value of mining properties on this coast has not of late suffered impairment in the estimation of Eastern investors. Not only in the purchase of miuing properties does this well-sustained confidence manifest itself, but also in the purchase of mining sharcs, many of the orders for which come from the East. Heavy deposits on Eastern account have also heen made in our city banks, thcse funds to be dishursed in purchase of mining stocks. The shares of several of our more prominent mines, such as the Standard, Bulwer, Bodie, etc., are meetiug with large sale at the New York mining board, where they are not only well received, hut seem to be speoial favorites.

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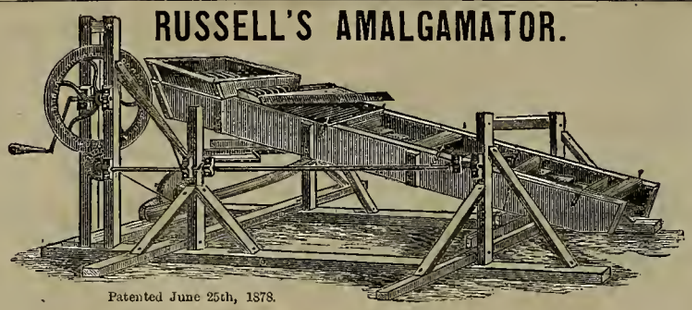

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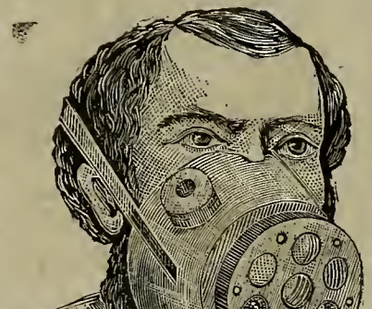

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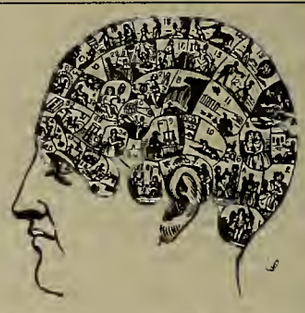

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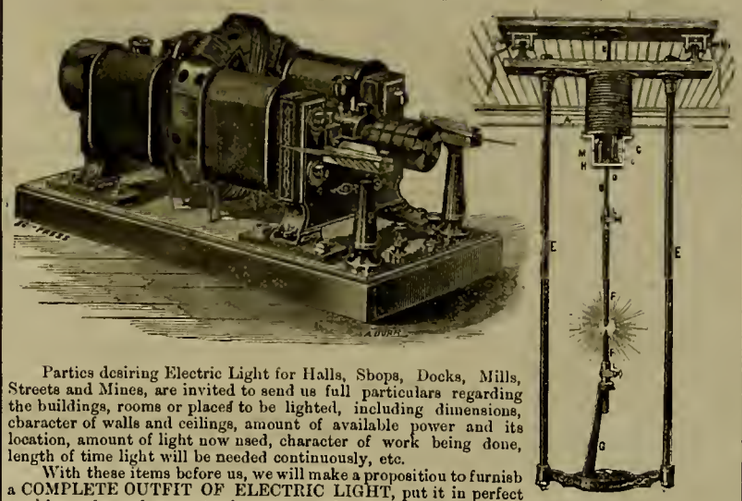

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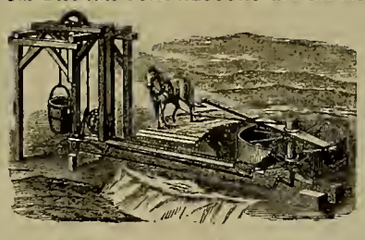

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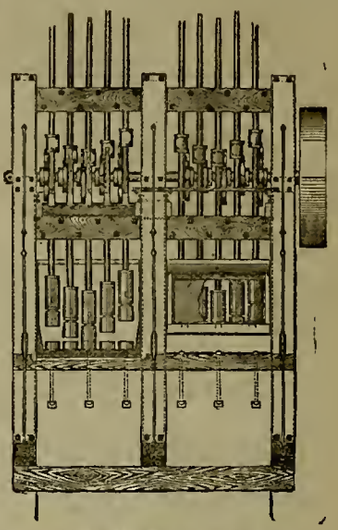

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Dewey & Co { 202 San-some St. } **Patent Ag'ts**

Continued from page 365.

720 ft, still cutting a mixture of clay, quartz and porphyry.

HALE & NORCROSS.—Repairs to the main shaft are still being made. The eighth station is being rebuilt with 16-inch timbers.

YELLOW JACKET.—Putting in the new spur-wheel. The shaft is down 2,577 ft. The drift west, 2500 level, is in 130 ft, the face in dry, hard, blasting porphyry.

BROPHY.—Advancing the tunnel at the rate of three ft per day. The material is a little softer and indications are improving.

BEST & BELCHER.—Sinking at the Osbiston shaft is progressing slowly on account of the strong flow of water.

LEVIATHAN.—On the 750 level the lateral drift north shows about half its face in low-grade ore and hard, vein porphyry. The south lateral drift on the same level continues in porphyry, with good-looking streaks of quartz occasionally coming in.

CROWN POINT.—The north drift, 2500 level, is now in 439 ft. This drift is being pushed along the west line of the ledge, and has encountered some very fine indications. The winze from the 2500 level has been sunk 25 ft below the 2700 level for a sump, and the station is now being opened.

SILVER HILL.—The sump of the incline below the 1300 level has been completed, and the incline is being prepared for lowering the pumps. The Boston and Thompson mills have been set at work reducing rock from the upper workings. Each has a capacity of 15 tons per day.

NORTH CON. VIRGINIA.—The property of this mine has been sold and transferred to the Sierra Nevada, Union Con. and Mexican for $1,100,000, and the deeds are recorded. Sinking is going on as usual.

LADY BRYAN.—The station, 750 level, is chambered out, and drifts are now to he run east and west from it to open up a portion of the mine as yet unprospected.

OULD & CURRY.—The repairs to the drift connecting with the Savage on the 1750 level have been completed. Sinking at the Osbiston shaft is somewhat obstructed hy the heavy flow of water.

HOMESTEAD.—Work is steadily progressing in the joint Homestead drain tunnel. After advancing the tunnel a few ft further a crosscut will be made.

UTAH.—The incline is 564 ft on the slope below the 1350 station. It is encountering a little more quartz as it is carried on down, but as yet this quartz is low grade.

ANDES.—The crosscut east from the top of the upraise from the 350 level is still in good-looking quartz, but of low grade.

MT. HOOD & VANCOUVER.—Still drifting toward the ledge. The average progress has, until lately, been four and one-half ft per day, and a little over four ft are being run daily now. The rock is hard porphyry.

EXCHEQUER.—North drift, 2400 level, is making four ft per day, and gradually entering a formation of low-grade quartz; total length, 460 ft.

NEW YORK.—The incline is being continued on below the 1200 station, and is making about four ft per day. Everything working well.

SUCCOR.—Some fine-looking rock continues to be cut in the north drift, 1100 level, and the drifts east and west, same level, still look well.

BELMONT DISTRICT.

BELMONT.—*Courier*, May 31: The mine presents a marked improvement. The ore body between 300 and 400 levels is looking splendid with the character and quality of ore daily improving. In the 300 level drift they have a streak of nice ore which is increasing in size every foot they advance the drift, and they hope ere long to be able to report a large body of ore in this part of the mine, as the prospects were never more encouraging than at present.

EUREKA DISTRICT.

HAMBURG.—*Sentinel*, June 1: Work throughout the mine has progressed as usual during the past week with no material changes to note. The west crosscut, 600 level, is now in 318 ft, its face is in red broken lime with seams of low-grade ore. The east crosscut from the south drift, 600 level, is now in 60 ft; the rock in the face is unusually hard. The ore body found near the old Hamburg shaft continues to look well, and is yielding ore of extra good quality.

FOURTH OF JULY.—The stopes above the lower tunnel level continue to look well, and are yielding a considerable amount of extra good ore. The north drift, from the bottom of the cave, was continued 18 ft. The vein is small at this point, but it continues to be of good quality. They will commence sinking a winze below the lower tunnel level in a few days.

EUREKA CON.—Mining operations have been continued through the week and good progress made, there having been 181 ft of drifts, winzes and inclines completed during this time. Have commenced cutting out for station at the 14th level. Three furnaces are now running and turning out the usual quantity of bullion. The following work has been done on the several levels: 4th, started drift running northwest, and made 18 ft; 5th, east drift continued 25 ft, and now in 139 ft; 7th, northwest drift continued 14 ft, and now in 65 ft; southeast drift continued 31 ft, and now in 131 ft; 11th, west drift from ore chamber continued 15 ft, and now in 60 ft; 12th, started winze in bottom of west drift, and sunk 24 ft; 13th, east drift continued 15 ft, and now in 92 ft; west drift continued 14 ft, and now in 94 ft; incline sunk 25 ft, and now down 130 ft to the 14th level station.

GOOD HOPE DISTRICT.

GOOD PROGRESS, ETC.—*Silver State*, May 31: Good progress is being made in all the mines in which any work is being done at present. Paige and Kelley have sunk a shaft about 120 ft deep on their claim, and are now drifting on the 80 level. The ledge is about four to five ft thick, with 20 inches of pay ore. It is principally ruby, and of a very high grade. Mr. Rhinehart thinks this is the best claim in the camp at the present time. The U and I mine is producing a good quality of pay ore, and the developments in the mine during the past week or ten days are very encouraging to the owners. The Buckeye has a good ledge, but owing to the hard formation, work progresses slowly. Some rich ore has been taken from the mine, and during the summer the owners will make arrangements, if possible, to have a considerable quantity of it milled. No work is being done on the Silver Brick or the Aurora mines, though when operations ceased, the ledges were looking well and the prospects promising. The flow of water in the Aurora shaft caused a suspension of work, and it will be necessary to put up some machinery before operations can be resumed. It is likely that further developments will be made in the Silver Brick during the summer. A great many sales of feet in the claim have been made recently, and it seems that the owners cannot agree as to the best me thod of working it.

PARADISE DISTRICT.

SEDAN MILL.—*Silver State*, May 31: The Sedan mill is now running steadily on Bullion ore, the proprietor of the mill having purchased all the ore on the Bullion dump—amounting to about 300 tons. The mill, with only five stamps, is producing on an average of $400 worth of bullion daily.

ARIZONA.

SILVER DISTRICT NOTES.—*Sentinel*, May 31: On the Red Cloud, four men are taking out 20 sacks of ore per day. They have uncovered a large body of rich metal at the northern end of the claim, two and one-half ft wide, and are working along at a depth of four ft; solid chunks of metal are broken out weighing over 400 pounds, which are broken up and sacked. This body has been followed to within 10 ft of the adjoining claim, the Emma. Two men are plackering the mesa, finding nuggets of 40 and 50 pounds. The Iron Cap mining company has let a contract for a shaft 100 ft deep, to be completed within 70 days, at $11 per ft, on the Iron Cap mine, and is negotiating contracts for sinking shafts on their five other mines. On the Rover, four men are working in the tunnel taking out ore and four are sinking the shaft in which they have struck ore; the men are working night and day. The shaft of the Black Rock is down 103 ft, at the bottom there is a vein of rich ore four inches wide. The adjoining claim, the Silver Glance, is yielding rich ore, five men are at work. On the Engineer, three men are working; the tunnel is in 50 ft, the drift 12-ft, and the shaft in drift is down 20 ft. At the bottom of the shaft there is a three-ft vein of good ore. The Klara has two men taking out ore. Two men on the Remnant are sinking a shaft, following a 10-inch vein, and are down 14 ft. Interest in the Rough and Ready, Clip, Iron Clad and other claims have been sold and still others bonded.

OREGON.

MINING ITEMS.—*Times*, May 30: The Squaw Lake company has been resetting its pipe, and is by this time moving the gravel at a lively rate. Robb & Co., at the Hamilton diggings, expect to commence making a final clean-up for this season in the course of a week or two. Claims on Silver creek command fair prices. One sold for $300 recently, and several others have changed hands at more reasonable figures. The parties from California prospecting the old Johnson ledge at Blackwell are said to be getting out good ore, which promises to be abundant. E. K. Anderson, at the Forty-Nine diggings near Phœnix, has washed considerable ground during the season, and is sanguine of excellent results. John Egan and others will at once resume the prospecting of a quartz ledge in the Willow Springs district, upon which some work was done last year. James McDonough has several specimens of very rich ore taken from the shaft of the Fort Lane mine at a depth of 40 ft. They exhibit free gold in abundance. Operations will soon be commenced on the ditch that the Savage Bros., F. M. Plymale, J. B. Wrisley and others intend running from Savage creek to some promising gravel beds in the vicinity of Rogue river, two miles beyond. Parties from Briggs' and Silver creeks report that recent storms have delayed mining operations there. Several hundred miners are now in that section getting ready to work the diggings, which in many cases prospect well. J. T. Layton and Kuhli & Bolt, who are running hydraulics on Farris gulch, made excellent clean-ups last week, which establish the value of their diggings. They will have plenty of water for several months to come. Messrs. Chadwick, McNevin and Lightner, who are doing much to revive the failing interest in quartz mining, are also turning their attention to placer mines. They have been and are now visiting several hydraulic claims in this county, and may conclude to invest. Johnson & Allison, mining on Jackson creek, made a partial clean-up last week, which proved a satisfactory one. They picked up several pieces of gold, one of which weighed $4.95, and another over $6. They will he able to pipe a few weeks longer before cleaning up finally.

Proposed Closing of English Coal Mines

The coal miners of the United Kingdom are in trouble and troublesome. The continued downfall of wages, the keen competition of capitalists, and ths constant guerilla warfare carried ou between them and their employers for the past four or five years has rendered them destitute and despsrate, and has led them to attempt united action for the adoption of soms means hy which a continuance of the prssent state of things may he prevented. To this end an important circular has beeu generally issued throughout the kingdom calling on all mining districts to send representatives to a confersnce convened to discuss the advisability of laying the whols of the mining communities of Great Britain idle for from four to six wesks. The following is an extract from the circular:

"Wales has been used as an instrument to hring wages down in Northumberland, and Northumherland, Durham, South Yorkshire and West Yorkshire and Lancashire, Cheshire, Derbyshire, Leicestershirs and North and South Staffordshire have played the same tune. Scotland also has heen passing through a like ordeal, heuce the desirahility for united action in trying to put an end to this ringing the changes on our hard-struggling miners' wages. The profits of colliery owners must not he allowed out of the hard-earned pennies of the miners. It has often heen said hy colliery owners and managers, from the first reduction downwards, that the collieries could not he carried on unless their workmen would concede to a reduction in thsir wages. This was said when coal sold at three times its present selling price, and the sams thiug is said now. Well, if the coal owners could not make a profit with coal selling at 18 shillings per ton, with the coal getters' price on an average at 2 shillings per ton, how in the world are they going to make a profit with coals selling on an average at 6 shillings per ton, with an average to the coal gettsrs of 1 shilling per ton. The statements of the owners ars ahsurd in the extreme, and the miners of this country must not lose sight of the fact that if they were to give the owners the remaining 12 psnnies, if owners cannot live now, neither could they live then."

One district has suggested that each district send in a notice for an advance in wages of 20%, and if the owners do not concede that all cease work until the same he granted. The conference was to meet in the Miners' hall, Barnsley, about the middls of May. As yet nothing has heen heard as to the results of the meeting nor of the action taken.

Bullion Shipments.

Sincs our last issue, we have noticed ths following bullion shipments:

Hillside, from May 30th to June 4th, inclusive, $11,000; Alexander, May 31st, $9,100; Northern Belle, May 28th, $2,428.86; Argenta, June 2d, $10,500; Independence, June 2d, $10,100; Ophir, from May 26th to May 31st, inclusive, $31,945.99; Standard, May 30th, $17,701.70; Christy Con., June 3d, $10,873.

AMONG the speakers at the next Yale commencement will he Chun Lung, a Chinese memher of the class of 1879, who will deliver an oration on "The Chinese in America."

ALL forms of auhscription to the 4% bonds have been closed at the Treasury Department in Washington.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING MAY 27TH, 1879.

LAMP SHADE—P. K. Ouild, Santa Barbara, Cal.
AUDER—Wm. Heyd, S. F.
CONSTRUCTING LEVEES—M. C. Lawlon, S. F.
ROLLER AND PULVERIZER—Geo. Meding, S. F.
SELF-ADJUSTING BRACELET—W. A. L. Miller, S. F.
HORSE CLOTHING—J. C. Simpson, Oakland, Cal.
ORE ROASTER—D. W. Brunton, Silver Peak, Nev.

The following foreign patents have been issued to residents of this coast:

English Patents

Which have passed the great seal:

104.—IMPROVEMENTS IN DRILLING APPARATUS—H. Richmann and U. K. Arnold, S. F. Jan. 10th, 1879.
327.—IMPROVEMENT IN BATHS—W. Wasson and C. N. Harris, Carson, Nev. Jan. 27th, 1879.

German.

5,678.—MANUFACTURE OF SLASS OF PESSLES AND ASPHALT Zadig and Neuberg, S. F. and Hauover. Nov. 10th, 1878.

Victoria.

2,6f9.—IMPROVEMENTS IN APPARATUS EMPLOYED IN THE PROPULSION OF TRAMWAY CARS SY MEANS OF ROPES—Wm. Eppelsheimer, S. F. Jan. 30th, 1879.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telgraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently ohtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

STEAM BOILER.—M. N. Laufenherg, S. F. Dated, May 20th. This improvsment in boilers, consists in a novel construction of the hoiler and fire-box, and the parts relating thereto, so that ths inventor ohtains more heating and tuhe surface, utilizes a certain portion of the firs-box without decreasing its capacity, and prevsnts the clogging of the tuhes, hy inducing certain draft currents in the fire-box depending upon its peculiar shape, ths grate and draft opsnings. While the engine is applicable to all kinds of hoilers and furnaces, it is especially applicable to those where it is intended to uss straw and and other light fuels which the draft has a tendency to carry into and against the ends of the fluss so as to clog them. The objects described the inventor accomplishes hy extending the tuhes into the upper part of the fire-hox, and sccuring them into a tube shect which depends from the crown sheet, at a point hstween the front and rear walls of the fire-hox, said tuhe sheet extending across the fire-box so as to he united with the side walls, while the plate beneath the tuhes is made in the form of an arch so as to concentrate and intsnsify the flame at that point, and also for ths purpose of preventing deposits heneath the tuhes. In comhination with this construction, Mr. Laufenherg employs a peculiar partial grate, having a draft opening or space at the rear and a plate in front, extending a short distance back from ths door so as to direct ths currents of air and assist ths comhustion.

AIR COMPRESSOR.—Jno. B. Pitchford, Gold Hill, Nevada. Datsd May 20th. The improvements in this air compressor consist, first, in a peculiar construction and operation of the discharge valves, wbereby, hy suitahle connection to the stem of said valves, whicb operate in sleeves or cylinders, the supply of water to the air cylinder is automatically regulated, and no water will be used in the cylinder unless the compressor is working, hut not then until the air valve opens, which is the time it is needed. Second, in the use of a peculiar governor in ths steam cylinder which is so connected with ths pipes leading from the compressor to the air receiver, that the speed of the engine is regulated hy the pressure of air in the receiver. Third, in the use of rubber plates on the piston for the purpose of rsducing the clearance spaces, hy means of which almost all the air can he sxpelled from the cylinder at each stroke. It furthsr consists in the method of placing the inlst valves and the drip plates connected with them, and also in comhining hrass rings and hemp packing in the piston so as to carry the moisture all around the piston in ths air cylinder hy capillary attraction and thereby kesp it luhricated.

FIRE LIGHTER.—Chas. E. Thompson, Stockton. Dated May 20th. This invention relates to a device for lighting ths fires of enginss, being more particularly intsnded to he applied to steam fire-engines where it is necessary to start the fire quickly. The improvements consist in mounting on a suitahle har under the grate of the hoiler a cup containing certain chemicals, and placing in said cup a glasa vial of liquid which when mixed with the chemicals in the cup will generate a flame to light the kindlinga in the fire-hox. Levers are arranged to he operated from either end of the engine hy means of cords, so that at the proper moment, hy operating a lever, the glass vial oontaining the liqnid will be broken and the liquid bs mixed with the chemicals so as to generate a flame.

SECURING BOOT STRAPS.—C. W. Lane, Aurora, Nev. Dated May 6th. This is a improved method of securing the straps to boot legs so that they can be more permanently and strongly fastened, and it consists in the employment of a metal clasp or rivet passing through the strap and legging and firmly binding them together.

SELF-CALCULATING WEIGHER.—J. S. Phillips, S. F. Dated May 20th. This is a novel apparatus for assayers' and prospectors' use, whicb is called the "Little Wonder" self-calculating sample and hutton weigher. We recently illustrated and descrihsd this device in detail in the PRESS.

News in Brief.

ARIZONA bas now ten newspapers.

OTTAWA is plagned with the smallpox.

INDIANS are committing murders in Texas.

PRESIDENT HAYES has so far scorsd five vetoes.

ALEXANDRIA, Egypt, is threatened hy a flood.

BARON ROTHSCHILD the great hanksr is dead.

A DISASTROUS cyclons has occurred in Missouri.

THE great Salt laks has rissu 11 fset since 1857.

THE increase of tbe public debt for May was $62,250.

BERMUDA had a heavy earthqnake on the 28tb nlt.

THE rivsr Po has risen and threatened damage to Turin.

AN overflow of Frazer rivsr is doing considerahle damage.

SILVER REEF, Utah, has been largely destroyed hy fire.

SEVENTEEN more Chiness lspsrs have bsen shipped for China.

THE Columbia and Willamette rivers in Oregon, ars rapidly rising.

THE Mechanics' Bank at Montreal, has snspended payment.

THE Dauish Polar expedition has heen heard from, and is safe.

A LARGE barrel factory is to be estahlished at Seattle, W. T.

THERE wsrs 80 deaths and 34 marriagss in the city last week.

MALIGNANT scarlet fever is prevalent in Los Angeles connty.

THE late Kansas cyclone killed 40 people and injured 70 or 80 more.

A MOUNTAIN lion is ravaging the Ravenswood mountains near Austin.

THE Manbattan Savings Bank burglars have at last been discovered.

THERE is a strike in progress among Buffalo, N. Y., "longshoremen."

A TWELFTH part of Warwickshire, Eng.,—100 farms—is advertised to let.

BRITISH troops in South Africa are suffsring from fever and dysentery.

RUSSIAN grain crops are suffering from the ravagss of a small insect.

THE Napa county mines lately shipped 37,750 pounds of quicksilver.

THE Portuguese cahinet has resigned and a new one is to hs appoiuted.

THE new military telsgraph is built to within 18 miles of Lswiston, Idaho.

DURING the month of May ths San Francisco police arrested 1,636 persons.

THE treaty of peace hetween England and Afghanistan has heen ratified.

IT is proposed to commence work on the Panama canal early in the fall.

THIS has heen the coolest season ever experienced so far in Fresno county.

THE Walla Walla *Statesman* pronounces the Snake River mines a "grand fizzle."

THE wheat crop near Salem, Orsgon, averages three fest in hight, and is very large.

SINCE cutting the hay crop, farmers around Chicb ars largely summer-fallowing.

THE first case of sunstroke for the season is rsported from San Luis Ohispo county.

AT the U. S. Mints during May, 1,795,090 pieces were coined, valued at $2,094,508.

THE Khedivs will accspt the nomination of European controllers with extended powsrs.

Two Cheyenne ladies have emharked in the cattle business, with 500 cows each as a starter.

ANDRUS and Brannon islands are fast getting out of watsr and into condition to raise crops.

THERE are 300 hoats engaged in fishing on ths Sacramento river, with two men to each hoat.

A LOAN is to be issued hy Russia for 300,000,000 roubles, to cover the expenses of the late war.

THE Puget Sound U. S. coast survey appropriation has run out, and work has been suspended.

NINE persons have died at Newark, N. J., from drinking poisoned watsr, and other are not expected to live.

Two car-loads of ore from a Battle Mountain mine, lately shipped to Salt Lake City, assayed $20,000.

THERE has heen a great eruption of Mount Etna, and several villages are seriously threatened.

UP to the lat of May the losses in the United States this year from fire have aggregated $32,381,000.

ABOUT 4,000,000 tons of rails are required yearly to replace worn out atock on the railroads now existing.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	6 Copies of No. 1, Jan. 7th.
1871	22	8 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	3 Copies of No. 17, April 27th.
1872	25	2 Complete volumes, last half (of year).
1873	26	4 Copies of No. 8, Feb 22d.
1873	26	3 Copies of No. 0, March 1st.
1873	26	4 Copies of No. 10, March 8th.
1873	26	2 Copies of No. 7, Feb. 15th.
1873	26	1 Copy of No. 6, Feb. 8th.
1873	27	4 Copies of No. 20, Nov. 15th.
1873	27	6 Copies of No. 21, Nov. 22d.
1873	27	4 Copies of No. 24, Dec. 13th.
1876	30	2 Copies of No. 4, Jan. 23rd.
1875	30	2 Copies of No. 5, Jan. 30th.
1875	30	1 Copy of No. 6, Feb. 6th.
1875	30	2 Copies of No. 8, Feb. 20th.

SOUTH PACIFIC COAST RAILROAD.—This popular line has made a reduction in rates between San Francisco and San Jose and Santa Clara, to take effect April 1st, 1870, viz: Regular local tickets between San Francisco and San Jose, $1.76; Santa Clara, $1.65. Round trip tickets (good until used) between San Francisco and San Jose, $3.25; Santa Clara, $3.05. Excursion tickets sold Saturday afternoons and Sunday mornings from San Francisco and Park street, Alameda, to Santa Clara or San Jose and return, $2 50; good only until Monday evening following date of purchase. Commutation tickets good for one round trip daily during calendar month, between San Francisco and San Jose, $20; Santa Clara, $10. Family tickets for 10 rides and 30 rides, also six months and yearly commutation tickets on sale at corresponding reduction in rates.
GEO. H. WAGONER, Gen'l Pass. Agent.
THOS. CARTER, Superintendent.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Friebie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., June 4, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @—
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, June 4, 3 P. M.

SILVER, 1.10@1⅛.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₱ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49⅝. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 89½@90⅛.

LONDON Consols, 97 5-16; Bonds (4½), 105⅛.

QUICKSILVER in S. F., by the flask, ₱ lb, 36c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending June 3, 1879.

HIGHEST AND LOWEST BAROMETER.

May 28	May 29	May 30	May 31	June 1	June 2	June 3
30.243	30.295	30.201	30.138	30.103	30.016	29.955
30.058	30.241	30.104	30.068	30.025	29.924	29.904

MAXIMUM AND MINIMUM THERMOMETER.

65	64	73	75	81	85	75
56	54	54	56.5	58	62	61

MEAN DAILY HUMIDITY.

81	60.7	64.3	66.7	61.3	57.7	60.3

PREVAILING WIND.

W	W	W	W	SW	NW	SW

WIND—MILES TRAVELED.

263	192	220	184	193	114	110

STATE OF WEATHER.

Fair.	Clear.	Clear.	Fair.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

.41						

Total rain during the season, from July 1, 1878, 24.39 in.

THE MINING AND SCIENTIFIC PRESS PATENT AGENCY was established in 1860—the first west of the Rocky Mountains. It has kept step with the rapid march of mechanical improvements. The records in its archives, its constantly increasing library, the accumulation of information of special importance to our home inventors, and the experience of its proprietors in an extensive and long continued personal practice in patent business, affords them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free. Address

DEWEY & CO.,
202 Sansome St., N. E. Cor. Pine,
San Francisco.

DESIRABLE OFFICES TO LET.

We have several sunny Rooms (lately occupied by A. W. Bowman and associates), adjoining the Mining and Scientific Press Patent Agency, at No. 202 Sansome street, corner of Pine, which we will rent permanently on very reasonable terms. Parties desiring pleasant office rooms should call and see them.

DEWEY & CO.,
No. 202 Sansome St., opp. Pacific Bank, May, 1879.

N. B.—Rooms from $15 to $25 per month.

Books for Miners and Millmen.

KUETEL'S ROASTING OF GOLD AND SILVER ORES, and the extraction of their respective metals without quicksilver. Illustrated. 142 pages. 1870. A valuable and carefully written work. Postpaid, $2.50. Published and sold by Dewey & Co., S. F.

KUSTEL'S CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for gold-bearing sulphurets, arseniurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Post-paid, $7.50. Printed and sold by Dewey & Co., S. F.

PHILLIPS' EXPLORERS, MINERS AND METALLURGISTS COMPANION, comprising a practical exposition of the various departments of exploration, mining, engineering, assaying and metallurgy. 672 pages and 83 illustrations. A most valuable and comprehensive book of reference to prospectors and practical miners. Post-paid, $10 50 Sold by Dewey & Co., S. F.

AARON'S TESTING AND WORKING SILVER ORES.—Illustrated. 114 pages. 1876. A useful and practical work, free from technicalities and extremely serviceable for miners' use. Post-paid, $2 Published and sold by Dewey & Co., S. F.

COPP'S HANDBOOK OF MINING LAWS.—Containing the U. S. Mining Laws, Digest of Decisions, Forms, etc. 1877. Pocket size and very handy and convenient for miners. Post-paid, $1. Sold by Dewey & Co., S. F.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, near Drytown, Amador County, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the twenty-first day of May, 1879, an assessment (No. 38) of Fifty Cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin or legal currency of the United States, to the Secretary at the office of the Company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the first day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the eleventh day of August, 1879, to pay the delinquent assessment, together with cost of advertising and expense of sale. By order of the Board of Trustees. W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, Cal.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 1) levied on the 17th day of April, 1870, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amt.
W B Douglass	90	23	$ 2 30
C J Pillsbury	34	2000	200 00
J C Rhoade	93	500	50 00
J C Rhoade	95	3000	300 00
J R Robbins, Trustee	12	500	50 00
J R Robbins, Trustee	15	500	50 00
J R Robbins, Trustee	17	68	6 80
J R Robbins, Trustee	21	1000	100 00
J R Robbins, Trustee	22	1000	100 00
J R Robbins, Trustee	62	1000	100 00
J R Robbins, Trustee	66	134	13 40
J R Robbins, Trustee	77	50	5 00
J R Robbins, Trustee	78	50	5 00
J R Robbins, Trustee	85	100	10 00
J R Robbins, Trustee	86	100	10 00
J R Robbins, Trustee	116	833	83 30
J R Robbins, Trustee	129	76	7 60
J K Cooper, Trustee	107	100	10 00
J K Cooper, Trustee	108	100	10 00
J O Whitney, Trustee	30	1000	100 00
J G Whitney, Trustee	42	500	50 00
J G Whitney, Trustee	43	55	5 50
L A Hinds	55	1000	balance 71 50
Ambroso Hinds	108	100	10 00
T L Bibbine, Trustee	98	100	10 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbine, Trustee	134	1000	100 00
T L Bibbins, Trustee	139	18	1 80
T L Bibbine, Trustee	145	800	80 00
T L Bibbine, Trustee	146	100	10 00
T L Bibbine, Trustee	147	50	5 00
T L Bibbine, Trustee	150	500	50 00
T L Bibbins, Trustee	153	30	3 00
T L Bibbine, Trustee	154	20	2 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbine, Trustee	161	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbine, Trustee	170	500	50 00
T L Bibbins, Trustee	173	77	7 70
T L Bibbine, Trustee	175	100	10 00
T L Bibbins, Trustee	182	100	10 00
T L Bibbins, Trustee	188	50	5 00
T L Bibbins, Trustee	189	50	5 00
T L Bibbine, Trustee	101	500	50 00
T L Bibbins, Trustee	204	500	50 00
M J Rhoads	110	2400	240 00

And in accordance with law, and an order of the Board of Directors, made on the Seventeenth day of April, 1879, so many shares of each parcel of such stock as may necessary will be sold at public auction, in the City of San Francisco, at the office of the Company, on Monday, the Sixteenth day of June, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale. T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

Amusements.

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BARTON & LAWLOR.....Manager.
SARTON HILL.....Acting Manager.

LAWRENCE BARRETT.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BUSH STREET THEATER.

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Open every evening and Saturday Matinee.

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THOMAS MAGUIRE.....Manager.
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CHAS. H. GOODWIN.....Treasurer.
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HOPE IRON WORKS,

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Pattern, Machine and Blacksmith Shop,

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STEVENOT'S
Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.

No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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Chemist and Mining Engineer,

304 Montgomery St., San Francisco.

REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

NOTICE
TO THE
MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Works, are the only parties authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the Licenses of this Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the licenses of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

The following are some of the Mining Companies who have recently adopted this Furnace, the most of which are now in successful operation, many of them running two and some three and four Furnaces.

NEVADA.—Grand Prize, Star, Martin White, Highbridge, Columbia, Alexander, Parsdise Valley, Jeffcreon, Leopard, Eagle, Endowment, Independence.

ARIZONA.—Tiptop, Tiger, Peck, Hackberry, Corbin, Tombstone, Bradshaw.

OREGON—Monumental.

MONTANA—Alice Mine, Butte City.

MEXICO—Trinidad, Harmiguera, Pomoees.

PERU—Cerro de Dasco.

RANKIN, BRAYTON & CO.,
Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned, as they will be vigorously prosecuted and involved in heavy damages.

THE BEST FILEHOLDER.—After having used Dewey's patent elastic hinge fileholder for over a year past, the *News* cheerfully indorses it as the best newspaper fileholder in existence, possessing important advantages over any and all others in use. The holders are neat, light and convenient, and the newspapers are placed in them with the utmost facility and least possible time and exertion. They are the simplest, handiest and cheapest of all. Anybody keeping files of papers in reading rooms, offices or at home, should send at once to the proprietor, A. T. Dewey, San Francisco, and get the only proper fileholder. Samples by mail fifty cents.—*Gold Hill News.*

Iron and Machine Works.

THOS. PENDEROAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

SACRAMENTO BOILER WORKS,

214 & 216 BEALE St., (rear of Ætna Foundry)

J. V. HALL,

PRACTICAL BOILER MAKER,

Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

ALL KINDS OF SHEET IRON WORK.

Repairing promptly attended to at the lowest possible terms.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

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PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Treetle Work, Car Frames and Bolts, Machine Bolts, Set Screwe and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

WM. H. BIRCH. JOHN ARGALL.

California Machine Works,

BIRCH, ARGALL & CO.,

119 Beale Street, San Francisco.

☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Brodie's Pateut Rock Crushers and Steel-Faced Tappits. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

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SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castiugs, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T. care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

UNION IRON WORKS.

Office, 61 First St. | Cor. First & Mission Sts., S. F. | P. O. Box, 2128.

BUILDERS OF

Steam, Air and Hydraulic Machinery.

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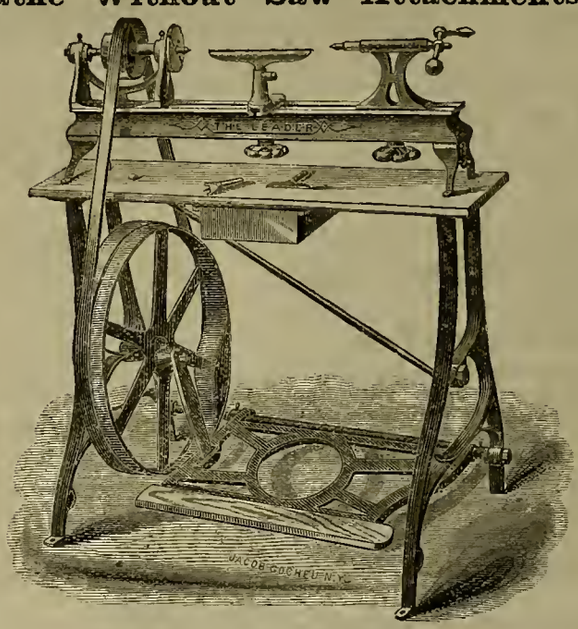

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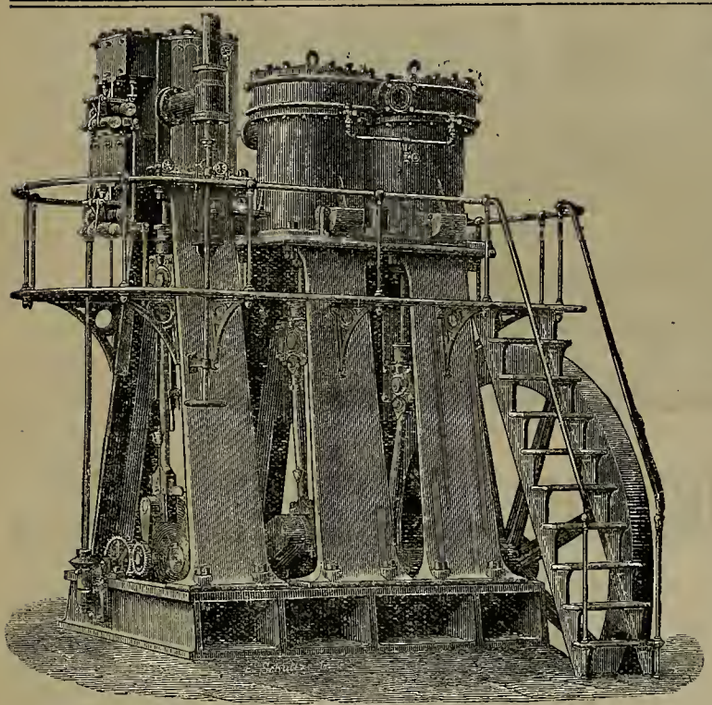

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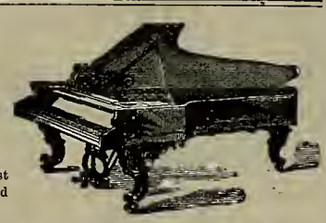

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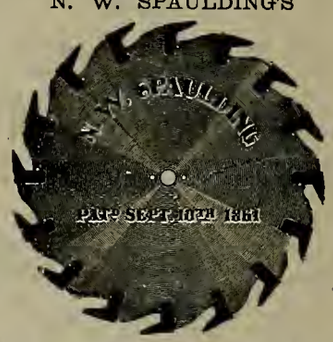

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JUNE 14, 1879.

VOLUME XXXVIII Number 24.

The Discovery of Gold in India.—No. 2.

The dip of the Soutb Wynaad ledges is nearly always to the east, and at tho higber psaks wbere outcrops appear, is very low—only about 10°, the ledge semstimes forming ths back or slope of a billside—on sntering lower ground they are found to increase in dip, and average from 15° to 30°. Almost invariably wbere the le lgs runs parallel to ths run of tbs hill, an abrupt and steep fall will be found to occur to the west of the strike, forming a bold escarpment, while on the sasteru sids the slope of ths hill is very gradual. This is caused by the hard overlie and top of tbe ridge forming a back and protection to the eastern slope, enabling it to resist the action of denudation, while the western has been completely denuded. The underlis on the western sids, the soft foot-wall, and tbe soft scbistose casings beneatb easily disintegrating and crumbling away; thus land slips are formed, rssulting in an escarpment, and the gradual wsaring away of the ledge from west to sast. Fig. 1 shows the section of a hill in the nsigbhorhood of Monarch Reef, whicb, as we msntionsd in a former article, has been tracsd for nins miles. Ths figurs sbows the outcrop of the ledge, and tbe manner in wbich tbe ledge is gradually wearing away from west to east; *a* sbows tbs hard snrface of the ledge, whicb for soms distance forms the surfacs of the eastern slops of ths bill; *b*, soft foot-wall; *c*, *c*, leaders and soft ground, full of ferruginous bands of quartz laminated witb motber rock, decompossd seft laminated, and very varied, but all red or yellow in color; *d*, *d*, tbin strata of nnderlying talcose scbist; *e*, boulders of compact veinstone, fallen down; dotted lines show where ths ledge bad oncs continued, but tbrougb vast ages bad washsd away; x, x, x, vast old workings and rsmnants of extensive sluicing and washing.

The rude implsments possessed by tbe ancient miners prevented them working the denss, compact, adamantins, but ricbsr stonc of the ledges, and thsir efforts were directsd solely to tbs working of the soft ledges and debris carrisd down into tbe valleys hy denudation of the higber ledges, and to tbe eluicing down of soft eartb and cement, afterwards collecting the gold which settled down among tbe stones which paved the bottom of tbe sluices. And Fig. 1 ebows the advantages taken by tbem of tbe workinge of natnre in denuding the bard and unyielding ledges, whicb would naturally resist their nnaided efforts. Their intelligence tangbt them the necessity of desulphurizing ore by means of fire, especially in tbe reduction of auriferous pyrites. Our means of knowledge concerning their implements are very limited, yet we may very correctly infer tbe absence of durable implements, since none are found in tbis district, imperfect as the exploration has beretofore been, but a more careful survey of the whole field may disclose evidences which will connect the workings of the ancient East Indian miner with his equally ancient co-worker in tbe mines of Arizona and Mexico. Tbat tbey had a substantially correct knowledge of mining is evident from their calcining auriferous pyrites before crushing, wasbing and amalgamating the residual fine gold. The retraced sluicings, as illustrated in tbe last number of this journal, and Fig. 2, bere eubjoined, sbow an intelligent capacity not altogetber in accordance with our first crude impressions of aboriginal contrivances.

Mr. Brougb Smyth, who was for many years Secretary of the mines at Melbourne, states that tbe yield of the ledges in this district varies from a few pennyweights to 200 ounccs of gold per ton of ore. As labor is extremely cheap at Soutb Wynaad, it is declared that from oue-half to tbree-quarters of an ounce per ton of ore would yield large profits. And Mr. Smyth's discoveries leave no douht as to the value of tbis district. A complete report will shortly be forthcoming, whicb we hope to lay before our readere at an early day. Our present impression is tbat there will not be very much emigration to tbese gold fields, owing to the prohably unfavorahle climatic difficulties. All present information is very meager, and we can only wait to ascertain whether our own slope is to bave a formidable rival in auother Englisb possession.

The San Francisco Free Library.

The Free Library was formally opened io this city last Saturday evsning, witb quits a good attendance. Tbe Presidsnt of tbs Board of Trustccs, Mr. Rogers, made a statoment to the public concsrning the incsption and difficulties in organizing tbe library. Hs explained the character of the "Free Library Bill," of wbicb be was the framer. He statsd that altbough the Supervisors were empowered to give one mill on the dollar of ths taxation, equal to $240,000, to the library fund, tbey bad only given one-tenth or $24,000. The Trustess finding that they had so small an amount, deemed it advisable to let it accumulato until there was funds enough to buy more books. Ths result is tbat tbe library hall bad been taken, fitted up with reading tables, nswspapers, etc., and nearly 6,000 volumes of books, of which probably one-half are beoks of references, at a total expense of some $12,000 to date; and tbey propose to make a circulating library as soon as there are hooks to justify it.

The next point touched upon by Mr. Rogers was that after they had received tbe assurancs of all tbe city officers tbat the money would be forthcoming wben needed, at the last moment tbe Mayor vetoed tbe appropriation, and they now bave no funds, altbough the money had been paid in by the public, and they are entitled to the benefits for the purpose for which it was paid in. The library bas now, however, opened, and he hoped it would never be closed.

After Mr. Rogers had concluded, he called upon Mr. Halbdie to make an address, which contained so many facts of interest tbat we eball publisb it in our next issue in full. Judge Sawyer, Henry George and Ira P. Rankin also spoke, and the library was declared open.

On Sunday there were 700 visitors; on Monday, 850; and on Tuesday, 1,117 visitors—an increase showing evidence of popularity. Tbe library is at Pacific hall, on Busb street, just above the California tbeater.

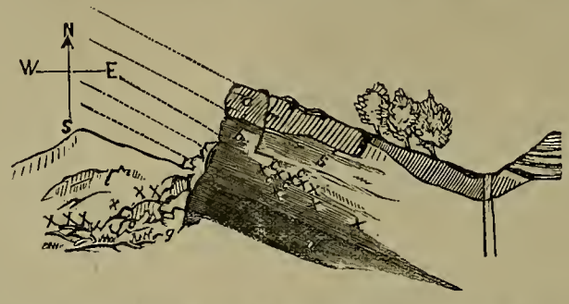

FIG. 1. DENUDATION AND ANCIENT WORKINGS.

FIG. 2. USE OF FIRE IN ANCIENT MINES.

LUBRICATORS.—Tbe valus of a lubricatiog oil lies in its anti-friction qualities. Tbe majority of lubricators pressnting a smootb surface to machinsry in rapid motion, do not for tbat reason possess good qualitics as a lnbricating medium. Microscopie examination reveals the fact tbat certain oils contain a greater or less number of globular bodiss, and tbs greater tbs mass of globules tbs greatsr tbe lubricating properties, because tbs friction being distributsd among many globular bodies relieves ths machinery and increases ths motion. Friction rollers indeed ars frequsntly used to lessen friction, but oils whicb contain unbroken globules answer the purpose psrbaps bstter and at less expense. It is in tbe mauufacture of the lubricator tbat the oil globules are broken up or prssarved intact; if broken, its valus as a lubricator is lessened, whils if preserved sntire its valus is increased. The microscope reveals the quality of tbe oil and determines its value as a lubricator.

PERSONAL.—On Monday nsxt ons of our pioueer citizens, Mr. O. C. Wheelsr, leaves by tbe overland route for tbe East, whitbsr he gees partly to fulfill certain literary engagsments and partly to look after the business of tbe Central Pacific Railroad Company, in wbose eervice he occupies an important and responsible position. The gentleman has heen a resident of California since Febraary, '49, having arrived via tbe Isthmus of Panama on tbe first steamer that ever entered this port. During his long residence on this coast Mr. Wheeler bas occupied a most useful and honorable sphere in a way tbat has secured to him the esteem of numerous friends and tbe confidence of the general public. During his absence in the East he will, in response to an invitation from tbe Faculty of the Southwestern University, at Jackson, Tenn., deliver tbe annual literary address before that institution.

THREE HUNDRED skilled ribbon weavere have left Mulbouse, Alsace, for the New Jersey silk manufactories.

Gold Mining in California.

Notwitbstandiog the advont of tbe regular wet season was later by two months tban usual, tbe prssent is likely to prove a fairly prosperous year with tbs placer miners of California. Tbs rains after tbey sst in were abundant, timsly and long-continued, having fallen at just tbe rigbt intervals and kept on until lato in the spring. Tbs weather too througbout the winter and early spring was generally favorable, the temperature being sueb that ths water was not frozen up about the sources of tbe ditcbes, nor the latter much obstructed witb snow and ice furtber down. Tbs watsr supply to the bydraulic minere bas tbsrsfore been ample, aod the conditions undsr which tbsy have been permitted to uss it all tbat could be desired. Bsing ready to employ ths watsr as seon as it eame, thsir claims having been gotten into good sbape bstimes, tbis class of miners bave mads the most of their opportunities and will bave reason to be satisfied witb tbs results of the seasen's work, now with tbe small operators drawing towards its eloss. Tbe big companies, who for tbe most part own their own ditches, reservoirs and sources of water supply, will bs able to continue piping for sseveral montbs yet, soms of tbem witb a diminisbed head till tbe advent of tbe fall rains.

With the perfection to wbich tbis method of gold gatfiering has besn brought, it stands now in the foremost rank of our miuing industries, a position it will doubtless bs abls to hold hereafter. This department of tbe business does not, bowever, offer a very wide fisld for investment, the unappropriated water at command being insuffioient for any great increase of gravel wasbing. Propsrties furnisbed with watsr and containing material of tbe rigbt kind, with goed outlst and otbsr favorabls conditions, offer the very best opsnings for invsstment to bs found in the entire rangs of mining enterpriss, while tbose differently situated present few attractive features to capital.

Of our lsading bydraulic companies it may bs observed tbat tbe North Bloomfield, the Milton and tbs Eureka Laks companies, on ths San Juan divide, are all running to tbeir fullest espacity and will make large profits the present year. About Quaker Hill, Little York, Dutch Flat and Gold Run, as many as 25 or 30 companies are yet actively at work and will clean up more gold tbis season than ever before. Tbe Excelsior company at Smartville are running off an immense quantity of gravel witb fair returns, tbe extensive repairs on their main trunk ditch baving been completed. In Butte, Sierra, Plumas and Trinity counties tbe bydraulic miners are doing extremely well, some new claims bere having lately been hrought into a productive condition. Along Slate creek and at La Porte there is more gravel washing being done tban usual, while at Brandy City a very satisfactory state of things is reported. This extensive property has lately been put in good shape, some mucb-needed repairs on tbe ditches, flumes, etc., having been effected. When tbe bedrock tunnel, now in progrese bere with that projected and about to be oommeuced, shall reach completion, tbe production of this mine will he more tban doubled, insuring for it a long and prosperous career. From every bydraulic camp on the Forest Hill divide we receive good accounts—also cheering newe from tbe hydraulic mines of El Dorado and Amador. At Blue Tent the breaking of a dam has temporarily interfsred with work, but the structure is to be at once repairsd, when operations will go on as before.

Quartz mining in California is making headway from one end of tbe State to tbe otber. Indeed, of this business, it may be said that it was never in a more prosperous or promising condition than at present. Drift mining is also making good returns and undergoing steady expansion, new ebafts and tunnels being started, and those already under way pushed ahead all over the State. Wing-damming will be undertaken at a good many points along the California rivere this summer, and somo of the dredging schcmes before inaugurated he again revived as eoon as the water reaches a low stage.

THE average weekly shipment of dead bsef from Boston to Europe is about 200 carcasses.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Letter from Arizona.

Extent of Arable Land in the Territory.

EDITORS PRESS:—There is in Arizona but a comparatively small amount of land that will produce crops of any kind without irrigation. Here and there little valleys of a few acres exist high up among the rugged mountains, where vegetables could be grown without other water than the natural rainfall. As for farming on any considerable scale, it is not to be thought of without water artificially applied; portions, though not all of the valley lands along the San Pedro, Santa Cruz, Gila, Salinas and other rivers, yield abundant crops of the cereals where a sufficient supply of water can be brought upon them. As yet, farmers have confined themselves chiefly to raising wheat, corn and barley, but it has been proven that the soil and climate are adapted to the culture of the semi-tropical fruits and other products, and these will be progagated more extensively as population increases.

Scarcity of Water—Settling in Colonies, Sinks, Etc.

The essential defect of the country is a lack of water. In some places it is found where it cannot be used; in others it is wanted where it cannot be found; and in a few places there is plenty where it is needed, as, for example, about the town of Phœnix, in the Salinas River valley, where large tracts regularly yield fine crops, and the community shows a condition of general prosperity. Here the water has not yet been all appropriated, and there is still plenty of fine land for improvement, more in fact than there is water to irrigate. The settlers or colony which proposes to enter upon farming here, has several difficulties to surmount in the start. As these troubles are better overcome by companies than individuals, it is usual to form colonies for the purpose; each member owning certain land and water privileges as may be agreed upon. The first condition is to find enough water for the purpose. This occurs only at intervals along the rivers, the water flowing sometimes for miles at a stretch far beneath the surface of the loose sand which forms their beds, and only rising at points where the bedrock obstructs its underground course. The taking of all the water out of the rivers at certain points seems to have only a local effect. At the present time the bed of the Gila is dry at Florence, the water all being in use, while 20 miles below, the water having gradually come in, flows with a volume quite as large as at Florence. This shows that the rivers carry a great deal more water than might be supposed, and fortunately that settlers above will not interfere, to any great extent, with the prior rights of those below. In preparing for irrigation, large allowances must be made for loss by evaporation and sinking in the light, loose soil through which the *asequias*, or ditches, have to be carried. It sometimes happens that the water taken out does not last to reach the land for which it is intended. The amount required per acre varies greatly with circumstances, but a safe and general rule is to take all that can be had and cultivate as much land as it will supply.

Irrigation—Its Difficulties and Importance.

The next trouble lies in getting the water up from its natural channel to an elevation from which it will flow to the arable lands. This is often difficult, and in many places impossible, as the river beds are usually from 10 to 20 feet below the desired level and hedged on either side by a belt of loose sand, through which it cannot easily be carried without fluming. There are places, however, where the channel is crossed by dikes of hard-pan or country rock. These are selected for the construction of dams, which require to be laid on good foundations to withstand the winter freshets, which sometimes carry them away, necessitating rebuilding. The irrigating ditches are here made wide and shallow, and with as little fall as possible, the land being so nearly level that it is necessary to keep the water as high as possible to be able to distribute over the entire surface. The construction of these canals is not very expensive, the soil being so light, with little rock and no timber obstructions to remove, that the work can nearly all be accomplished with plows and scrapers. Once having the water at a proper hight and clear of the sand belt, it is a comparatively light task to carry it where wanted. In some sections the canals, when in constant summer use, become obstructed with a species of water-grass, which, fastening its roots on the inner banks, grow so rapidly that it has been known to attain a length of two feet in a couple of weeks. Its long fibers waving in the stream from either bank become entangled, and unless removed from time to time, chokes up the channel. A ditch less than a mile in length, near Tucson, requires the constant labor of one man to keep it clear of this intrusive fiber. The trouble, however, can be averted by turning the water off for a few days, when the burning sun quickly scorches the grass to death.

Land and Land Grabbing.

As before remarked, of the vast area of this Territory, but a diminutive fraction is suitable for grain raising in its natural state. There is much good land along the river valleys still open to pre-emption and entry under the Desert act, the most of it being desert land. Indeed, all that skirting the rivers for many miles where they run underground is, of course, worthless. Much of the land is too high for irrigation, even could the water be had; and still a great deal is in itself so sterile that no amount of water or culture could make it profitable. Land grabbing has not been indulged in here to any great extent, or any material profit as yet. In several cases the grabbers have quite overreached themselves by acquiring large tracts which were afterwards found to contain but a very small proportion of available soil; and they have discovered that it is possible to loose money on land even at two bits an acre. Those who think of settling here cannot be too strongly urged to examine carefully into the forgoing points—the idea prevailing to some extent that land which can be had for a trifle or nothing is better than no land at all. There are countless miles of country here that would break the capitalist who tried to work it, even if he got it for nothing. Still it must not be inferred that there are no lands left which can be acquired and worked to advantage; on the contrary, there are many opportunities for either colonies or individuals to settle here, and by industry and perseverance acquire a competence. The precautions to be observed are to get lands fertile in themselves, and which can be supplied with an abundance of water. Much of the choice land on the Santa Cruz and San Pedro rivers has already been pre-empted or taken under the Desert land act, but both the Salinas, or Salt as it is here called, as well as on the Gila river, there is much good land that can be had for the taking, and which could be cultivated to great profit.

Local Causes of Disease.

A disease of the same type, but differing in some respects from the ordinary chills and fever, is quite prevalent on the San Pedro and in other localities where the indigenous growth of cottonwood, willow gourd vines, and other vegetation is heavy and luxuriant. This is partly attributed to this fact that our two rainy seasons, in conjunction with the very warm weather, cause rapid and excessive decay of vegetable matter. It is believed that this sickness will diminish rather than increase as the native growths are rooted out and the land comes under careful and systematic cultivation, for in the older settled communities, such as Florence and Phœnix, both farming centers, this complaint is not prevalent. With this exception, the whole country may be regarded as one remarkably healthy, though

The Climate and Its Effects

Prove decidedly enervating to some constitutions, many being so overcome by it as to readily fall into idls and thriftless habits. This is very apt to happen with persons thrown much into the company of *Mexicans*, who form a large portion of the present population, and who, as a class, are but little in advance of the native Indians. Like the helpless shellfish they lie demurely waiting any morsel that the tide may bring them, actual starvation being the only thing that can stimulate them to exertion. To sit all day long in the shade, the first duty of life being rest and sleep, with a diet of jerked beef, chile pepper and unleavened bread; watermelons in season being considered luxuries, and his head wreathed in the smoke of his cigarita, is the highest happiness and chief aim in life with the natives of this country. When he has the ambition to try and raise a patch of grain he yokes two steers together by the horns, and uses a forked tree for a plow, cutting one prong short and sharpening it to scratch up the soil; the other being left long enough to form a tongue to reach to the yoke. The irrigation of the field is intrusted to a half-clad vagabond called a *peon*, who discharges his duties in a listless and slovenly way. When the crop requires to be harvested, he gathers a crowd, and with butcher-knives, swords and sickle, send them forth to gather the heads by hand into little piles of 10 or 15 pounds each. He then ties his steers to a dry raw-hide, skillfully turned up at the edges to form a drag or sled, and on this conveys the grain to a *patio* or yard carpeted with raw-hide, no modern innovation of thresher or sweat-producing flail being suffered to mar the primitive glory of the harvest. A herd of horses and cattle is turned in to tramp the grain and chaff asunder; after which, taking advantage of a windy day, the squaws winnow it with baskets. As soon as ready for market it is sold, even though it brings not more than enough to purchase a gaudy pair of pants to parade before the dark-eyed maidens of the neighboring village. Should the crop be a failure, then, with a sigh of relief at having escaped the toil of the harvest, he goes cheerfully to the task of devising ways and means to steal enough to tide over until the next season. When a white man has adopted the above, and sundry other customs peculiar to the Mexican, he is said to be "galvanized;" he who escapes this process being called a "tender-foot."

If, with all the disadvantages of crude and primitive farming, as above described, even the Mexicans and Indians can manage to get along here, it is certainly feasible for white men, with improved machinery, not only to live, but to make money at the same business. The arable lands are all level and of broad expanse, and well adapted to the use of machinery. "Lodging" and rust are troubles hardly known and heavy crops are a foregone conclusion wherever the land is properly tilled and the conditions are favorable to begin with. The expense of clearing land in most places is simply nothing, a heavy plow answering to grub up the sage brush, about the only shrubbery. Where the mesquit reaches the dimensions of a tree, the wood more than pays for its removal from the land. Although fencing is sometimes resorted to where the clearing of the land furnishes the material, it is by no means necessary, stock ranges being confined mostly to the mountain districts, where farming is impracticable.

As in California, many of the farms here are encumbered with mortgages, and their owners so burdened with debt that they find it difficult to make ends meet, being usually obliged to sell their crops as soon as harvested. Whether this be caused by shiftless habits or otherwise it is a thing deeply to be regretted, as it throws almost the entire profits of the business into the pockets of speculating merchants, who buy at harvest time and rarely fail to make a profit of 200% on their purchases before the end of the season.

* * *

Railroad Project in Tulare County.

EDITORS PRESS:—An important project is on foot to connect Grangeville with Hanford by rail, a distance of four miles. The single track railway, of which D. B. James, of Visalia, is the patentee, will be used. A trial of a good-sized working model of this road was made at Grangevills recently. On a short track laid for the purpose, a hand-car 3x7 feet was run by Mr. James. It carried eight sacks of barley and three large men, or some 1,300 pounds in all, and worked readily. A boy 14 years old could easily run it up or down the track. The track consists of two pieces of stout scantling laid side by side, leaving a deep groove between. A single row of wheels is used, the deep flanges of which run in this groove, broad rims of the wheels on each side running on the scantlings. Engine and cars are readily balanced. This is the same inveution that Governor Fremont proposes to introduce into Arizona. Citizens in and near Grangeville were so well satisfied with results that they determined to take steps to build and equip one mile of road running towards Hanford. A committee is now getting subscriptions to make up the $3,000 necessary for this object. It is estimated that this will secure an engine of sufficient power to haul 75 tons, provide a car or two needed for experiment, and build one mile of track. According to Mr. James' estimate the entire cost of each mile of track will be about $1,000. So that the three additional miles needed to reach Hanford will cost about $3,000 more, or a total cost of $6,000 for the four miles of road and equipments. This is one-sixth of the usual estimate at low figures for a narrow-gauge road in California. Cars are expected to cost as follows: Flats, $150; box cars, $250; passenger cars, $500 or $600. Such cars can be built to carry from 5 to 10 tons. It is believed that

A Speed of 25 Miles an Hour

Can be easily and safely made on such a road. They expect to have this first mile in running order within 60 days from the time the $3,000 in stock is subscribed. Should the four miles proposed prove such a success as is anticipated, the projectors then propose to extend the road across King's river and on the west side of the San Joaquin down to Antioch. It is calculated that a road of this kind for that distance—about 180 miles—can be built and equipped for less than $250,000. What a great relief this would be to the farmers and other shippers of this valley, on the vital question of transportation.

J. W. A. W.

Hanford, Cal.

DEPTH OF EARTHQUAKES.—The recent earthquake at Virginia City was not noticed at all in the mining depths, but only by people on the surface. Their famous earthquake of some years ago, which shook down chimneys, fire walls, cracked brick buildings, and did other damage, was merely noticed by some of the miners working in the upper levels, but it did no damage, not even shaking down loose stones and earth. The station men in the various shafts felt it the strongest, and the deepest point where it was noticed was by the station tender at the 900-foot level of the Imperial-Empire shaft—900 feet below the surface. He said it felt like a sudden faint throb or pulsation of the air, as though a blast had been let off somewhere at a distance, above, below or in some indefinite direction. In some of the mines the shock was not noticed at all, even by the station men. Commenting on this peculiar fact at the time, the Gold Hill *News* remarked that the earthquake seemed to be an electrical disturbance proceeding from the atmosphere and not from the depths of the earth.

TROUBLE AHEAD.—Utah is threatened with a drouth such as it has not seen for more than a score of years. The spring has passed with only a single shower and there was less snow on the mountains on the first of April than the oldest inhabitant remembers to have seen. The Sevier river which in May, as a rule, is full to the top of its banks, is reported dry in Millard county. Iron and Beaver counties it is feared will not have sufficient water to save the growing crops, while the vineyards in Washington and Kane counties are in danger of being dried up.

The Great Railroad Strife.

Within the undeveloped region lying west and southwest of the Mississippi river is to occur an activity for the next 25 years of which that on the Pacific coast will prove to have been but the precursor. The Atchison, Topeka and Santa Fe railroad, now traversing Kansas, Colorado and New Mexico, is to be a transcontinental road, with an outlet at Guaymas, on the Gulf of California. The Southern Pacific railroad is to be another. One is pushing on with all possible speed westward, and the other is coming east at the same rate, and having already advanced nearly 200 miles into Arizona, will be at El Paso, 500 miles eastward, by next year. From both of these trunk roads there will necessarily be laterals, or feeders, running north and south, and having for their grand ultimatum the control of the trade with Mexico. The 8,000,000 of people inhabiting that country will naturally prefer a close commercial intercourse with the United States, which they will have by railroad connection such as the current schemes involve, to the slow, costly and circuitous intercourse by sea with England and Germany. The Union Pacific and Kansas Pacific railroads are headed off by the superior activity of the Atchison, Topeka and Santa Fe, which has already pushed down to Las Vegas in New Mexico, and will be at Albuquerque before the close of the year. This road has absorbed the Denver and Rio Grande narrow-gauge, and will make its rapid way through New Mexico into Arizona to Tucson, at the lower end of the Santa Cruz valley, where it will meet the Southern Pacific, already nearly at that point, on its way to El Paso. From Tucson the route will be south, up the Santa Cruz valley and through Sonora to Guaymas, on the Gulf of California.

At the head of this rich valley, and in the center of the vast district whose mineral products are soon to astonish the world with their vastness, is located the incipient City of Calabases, yet to be known to fame. Through this city, whose climate is described as that of Italy, the Southern Pacific will unquestionably pass on its eastern way from Tucson to El Paso in New Mexico, while the Atchison, Topeka and Santa Fe road, taking a more comprehensive name as it enters Arizona, will construct the Mexican and Guaymas railroad through the same valley and city into Sonora to the Gulf of California at Guaymas. That will constitute its base line of operations in moving upon Mexico and its trade. Millions of dollars worth of trade passes up and down that valley to and from Sonora to-day. The concealed but well-known mineral wealth of Arizona, then, together with the rich traffic of Mexico, being the objective point and grand aim of these two transcontinental roads, it is natural that each should struggle with all its might to see which shall occupy the commanding position in the coveted field. The route known as the 32d parallel is, as it has been from the beginning, the object of desire among powerful railroad corporations. The Southern Pacific likewise threatens the Union Pacific in its current designs. The owners of the Central Pacific are the builders of the new Southern Pacific. In order, therefore, to obtain a southern outlet on the Pacific, instead of being limited to the one now granted it by the Central, the Union Pacific will push the Utah Southern road southward across Central Arizona to San Diego, which is one of the only three great Pacific harbors belonging to the United States. This will make transcontinental routs number three. Thus will the Union Pacific break away from the restraints of the Central Pacific, and the latter, owning the Southern Pacific, will escape from those of the Union Pacific, on its way east.—*Boston Post.*

NARROW-GAUGE.—It is a pretty well settled fact that a narrow-gauge railroad is to be run from Maricopa to Prescott. It will undoubtedly take in Phœnix, from which place the "knowing ones" seem to think the road will come by way of Wickenhurg, and thence on through Peoples, Kirkland and Skull valleys. It is understood that Eastern capitalists will take the matter in hand and commence the erection of this much-needed road at once. So soon as Prescott is connected with the outside world, by rail, one may expect to see business revive and a new state of affairs reign. When capitalists can jump aboard the iron horse and be hurled over the continent with ease and luxury to the very doors of their mines, then Arizona may look for that class of people within her borders. If they have not the water wherewith to work vast reduction works at home, the mineral-perforated ores can cheaply be carried away to the Salt River valley, where an abundance of water and wood abounds. Machinery and supplies can be landed at a much less figure than at present; wool, hides, lumber and other products can be shipped cheaply and quickly to market. Prescott, with a terminus wherein would be built round-houses, machine shops, depots, would step to the front and become the liveliest city east of San Francisco, and her people would awake in a few months and find themselves surrounded by wealth and everything else pleasant.

A CURIOUS ancient Mexican library has been found in the ruins of a vast palace at Xayi, near Chiapas, in southern Mexico. The writings are inscribed on terra-cotta tablets, half an inch thick, and are supposed to be sacred records, but the language in which they are written is not accurately known.—*L. A. Commercial.*

MECHANICAL PROGRESS.

Preserving Timber by the Hayford Process a Failure.

Whatever may be thought of ths merits of infusing creosote, sometimes called carbolic acid, into the fiber of timbsr for its preservatiou, we know that either the material or the method adopted to infuse it into the pores of the wood used in the construction of the U. S. S. *Vandalia*, was a total failurs. In some cases the strength was so completely destroyed that planks broke into two lengths while being trasported on men's shoulders from the tank to ths vessel.

The effect of the infusion of this material into the fiber of green timber, on its etrength, seems never to havs been thought of, much less tested. So far as observation could dstermine, the strength was impaired in the ratio of about the amouut of material infused. It was fouud by tbe workmen, who left their dinner baskets standieg in contact with the timbor so treated on the *Vandalia*, from roll-call to dinner time, that the food had acquired a greenish hue, and could not he eatsn. The most sensible method of ssasoning timber, so as to make it durahle, is to extract the poisonons juices drawn up into the fiber by capillary attraction. If this is properly done the timher will he stronger than when in its green state. There are several methods by which this desirahls end may he secured, at reasoeahls cost, and the timber made secure agaiest rot for the third of a centnry, at least.—*American Ship.*

To Temper Mill Picks.—1. Take two gallons rain water, one ounce of corrosive sublimate, one of sal-ammoniac, one of saltpcter, onc and one-half pints of rock salt. The picks should he heatcd to a cherry red and cooled iu the hath. Ths salt gives hardoess, and the other iegredients toughness to the steel; and thsy will not break if they are left without drawing ths temper. 2. After workieg the steel carefully, prepare a bath of lead beated to the boiling point, which will be indicated by a slight agitation of the surface. In it place the end of the pick to the depth of one and one-hali inchee until heated to the temperature of the lead, then pluegs immediately in clear cold water. Ths temper will be just right if the bath is at the temperaturs required. The principal requisites in making mill picke are: First, get good steel. Second, work it at a low heat; most hlacksmiths injure eteel hy overheating. Third, beat for tempering without direct exposure to the fire. The lead bath acts merely as a protsction against ths hsat, which is almost always too great to temper well.

Tin plate manufacture hids fair to soon become an important industry in the United States. A largs establishment has recently heen estahlished in New York, and is now known as the Monitor Tin Plate Company. It occupies a building in Horatio strest, where the tinning is done; but the iron is rolled at a mill in Pittshurg. The tinning house is 100 feet square, fitted with every modern appliance. The sheets are rolled in the ordinary way, then cut or sheared to size, and immerssd in a pickling bath. They are thsn cold-rolled again, annealed and pickeled, and put into haths of Russian tallow or palm oil. Then thsy pass through several baths of tin melted at a high temperature, and again through sawdust and bran to cleanse the surfacs. Finally, they are polished with lamb's wool huffers, and assorted, ready for boxing and shipping. The annual amount of tin plates imported into the United States in 1873, reached the large sum of a fraction short of $15,000,000.

Railway Notes.—Since the huilding of the Mount Washington railway eight similar roads have been constructed in Austria and Switzerland. The engines for these roade were firet built with vertical boilers; nsxt with hoilers that were level on an averags grade; now they are built with horizontal hoilers like ordinary locomotives. Various methods have heen devised for enabling the locomotives to work hy adhesion of their smooth wheels, as well as by means of their cog-wheel drivers, and by means of eithsr at will. No one of these has heen permanently successful, however, so that the proper construction of a double engine of this sort is still a matter of experimental inquiry.—*Scientific American.*

A New Steam-Proof Cement.—*Dingler's Polytechnic Journal* gives a description of the manufacture of a new steam-proof cement, discovered by Mr. A. C. Fox, which, it is claimed, is not affected hy hot or cold water, nor by acids or alkalis. First, a chromium preparation is mads in the following manner: 2.5 parts, by weight, of chromic acid ars dissolved in a mixture of 15 parts of water and 15 parts of ammonia. To this solution ahout 10 drops of sulphuric acid, and, finally, 30 parts of sulphate of ammonia and 4 parts of fine white paper, are added. When ahout to be used, gelatine diesolved iu dilute acetic acid is added.

Paper Bricks.—A manufactory of paper bricke has been etarted in Wieconsin. Ths bricks are eaid to be exceedingly dnrable and moisture-proof. They are also larger than the clay article. What next?

Iron Fencino.—It is almost nnnecessary to speak of the advantages which irou fencing possesses ovsr that which did duty in the days of our fatbers. These are so well known that to recapitulate them would be like telliog a twics-told tale. The only qnestion is to ascertain the best kied of iron fencieg to adopt. Specially valuahle is that which is made augular and coetiuuous. Much experience has led to the coeclusion that angular iron is a good deal stronger than a solid plats of the same wsight, and, therefors, better adapted for contiuuous iron fencing thau flat hars. Strength, of course, is a most important item in deciding upon fencieg; but this is not the only advantage. Each bar, for instance, being solid, without joint or weld, it cannot be broken at the ground line. No holes have to be dug, for the staedards are driveu direct to the ground, and ars tbers securely fixed; thus they ars very easily erected. Moreover, the upright bar heiug broader, the feucing can be distinctly seen by horses and cattle, and thus the risk of stock runuieg against it is considerably reduced.

Home-Made Drill Rous.—The *Iron Aye* says: Until witbin a few mouths, the successful manufacture of flee drill rods and compressed wire has been carried on exclusivcly abroad. Recently Messrs. Miller, Motcalf & Parkiu, of Pittsburg, have secured the exclusivs control of the necessary machieery for tbe maeufacture of these articles, and have succeeded in producing an article excellent in accuracy, finish and quality. They manufacture all sizes, from No. 60 to ½-inch, and have lately perfected machinery to finish sizes up to 1½ inches. We helieve these large sizes havs never been prodnced, and it will certaiely be of interest to manufacturers of fine machinery to know that this material can he obtained at home without the delay attending foreign orders. The accuracy and finish required by tho trade in this product, which must not be confounded with drawn wire, ie surprising. Ths compression to which it is snhjected perfects the finish and adds to the value of the hne steel from which it ie made.

Improvement in Railroad Locomotion.—The obstaclee in the way of ths use of light locomotives have, it is claimed, been met in a measure by recent inventions of Mr. Georgs French, of New York city, which ars iutended to increase the adhesion of light eugiees without adding to their weight. One of the inventions, intended for engiues of mogul pattern, doce not chaege the general construction, hut adds to the trailing wheels a pair of grooved tires, the groovs heing just deep enough to firmly grasp the head of the rail. These wheels do not rest upon the track in the regular work of the engine, but when it is necessary to increase the adhesion, as upon an up-grade, they are lowered, and the head of the rail is grasped in the grooves of the wheel. It is claimed that this arrangement gives all the adhesion needed.

Making Spikes by Machinery.—One of the most interesting sights seen by the mining engineers in their recent excursions about Pittsburg, Pa., was the continuous rolling mill, and ths spike machines at Dilworth, Porter & Co.'s. A billet of iron ahout 5 feet long and 2 inches square enters the rolls and is carried directly through ten paire of horizontal rolls placed one in front of the other, revolving at successively increasing speeds, and emerges in the shape of a long rod ahout half an inch square. Ths rode are carried without further heating to four epike machines, each of which turns out a complets spike in ahout a second of time. There is scarcely any operation in the manufacture of iron specialties which is so well done entirely by machinery and without any skilled lahor.

Compressing Liquid Metal.—We have already alluded, in these columns, to the importance of compressing metals while in a liquid state, to increase their strength when cold. A late number of *Von Nostrand's Magazine* contains a lengthy article on this important practical fact, in which the writer thinks ths practice of casting undcr pressure is likely to be extensively adopted in the manufacture of steel. Ths process of cold-rolling has been found to increase the strength of bar iron in some cases as much as 100%.

Cheap Steel.—The London *Times* remarks that "the Bessemer process has ruined the manufactured iron trade." But it has done more than this; it has distributed among many countries the mannfactors of cheap eteel, and thus enabled them to supply more fully their own metallurgical wants and the metallurgical wants of other countries, in lieu of their own previous partial dependsnce upon Great Britain for both iron and eteel products.

Boots and Shoes with Stone Soles.—The *Engineer* states that a German inventor proposes to make boote with stone soles in the following manner: He mixes a suitahle quantity of clean quartz sand with a water-proof glue, and spreads it on a thin leather eole, which ie employed as a foundation. These quartz soles are said to he flexible and almost indestructible, while they enahle the wearer to walk safely over slippery roads.

Improvements in the Steam Engine.—Daney etatee that future improvement of the steam engine muet be in ths direction of remedying the following defects: The present emall ranges of temperature, the waste of heat by radiation, the too ready heating and cooling of the cylinders and pistone, and mechanical inaccuracy.

SCIENTIFIC PROGRESS.

Intra-Mercurial Planets.—Camille Flammarion, the well-knowu French astronomer, has heen examining iu *La Nature* tbe evidences in favor of iutra-Msrcurial planets, and particularly that furnished hy Watsou & Swift. Ou the latter M. Flammarion says: "While it is possible that the American observers saw ae iutra-Mercurial planet, or sven two, we cauot, in view of tho special difficulties of the situation, the confusion of the figures, aud the negativs observations of the ether observers, coucede it to he an absolute and incoutestahle fact that they saw even so much as ons. The fact is not yet certain." After reviewiug the wbols testimony thus far available on this interesting point, the French writer sums up as follows: "The hypothesis of a siegle body comparable to Mercury gravitatiug iu closs proximity to the sun and on a plane probahly iuclieed to the eolar equator seems to us to be so open to objections as to he nutenable. Still, the mathematical theory of universal attraction proves that there is a cause for the retardation observed in the motiou of Mercury, and that this cause cannot be found hy augmentieg the mass of Vcous—a quantity now determined with great exactitude—hut must be sought for in some disturhing mass between Mercury and the snn. But this mass may not be a planet worthy of the name of planet; it may consist of a great number of asteroids like the miuute fragments which gravitats between Mars and Jupiter—astsroids so small tbat oftentimes they escape the notice of observers of the eun and of cclipses, though eome of them may he large enough to hs seen under certain rars conditioes. Ths latter theory is the one which we adopt."

A New Refrigeratino Liquid from Beets. In Europe the principal supply of sugar is derived from beets; the annual production of beet eugar heing now 700,000 tons. Besides this a large quantity of heet molasses is produced, a portion of which ie distilled and a coarss sort of whisky made; the stuff remaining in ths retort yields potassium salts, which are employed as fertilizers. Sugar, spirits, and potash have heretofore been the chief products manufactured from beets. But Mr. Vincent has now succeeded in rsalizing from the refuse that remains after the heet molasses distillation, a combustihle, gaseoue body, which is easily condensed into liquid form, and is called chloride of methyl. Thie liqnid, ohtained as stated from heets, is used in tbe preparation of some of the anilins colors; hut it is now found to be especially valuahle as a refrigsrating agent. By its rapid evaporation a temperaturs of 55° C., or 67° Fahr. below zero, may he maintained, which is far below the freezing point of mercury. Prof. Huxley says that by this means mercury (which freezes at 39° Fabr. below zero) may be frozen hy the pound. For the manufacture of ice tbis new beet root product promises to hecome of much importance.—*Sci. Am.*

Malleable Nickel and Cobalt.—Fleitmann bas succeeded, by a very simple device, in obtaining cast nickel in a malleable and ductile form, even when cold, while cohalt prepared in the same manner possessed such hardness when cold, that he expects it can he used for cutting instruments, while hot it is hoth malleable and ductile. His process consists in adding to the fused metal, through a hole in the lid of the crucihles, one-eighth per cent. of metallic magnesium, which possesses a remarkahle power of deetroying carhonic oxide. The author is of the opinion that ths porous and crystalline character of cast nickel is due to its absorption of carhonic oxide gas while in a molten state. It is not impossible, however, that owing to the great affinity of magnesium for nitrogen, its action may he due to the destruction of cyanogen in ths metal. Cobalt prepared in this manner possessed none of the reddish color attributed to it in the text-hooks, hut actually excelled nickel in whiteness and brilliancy. He also welded these metals on to iron and steal at a whits hsat, and strips thus welded were rolled out to the finest number without scparating from each other.—*Berichte d. d. ch. Ges.*

Nitrous Oxide under Pressure.—P. Bert finds that by placing a patient in an apparatus where the pressure can be increased to two atmospheres, nitrous oxide can be administered so as to produce continued anæsthesis, while the hlood receives its normal snpply of oxygen and the normal conditions of respiration are maintained. From various experiments on auimals, hs thinks that gas administered in this way will he harmless, however much the insensibility may be prolonged.—*Comptes Rendus.*

Further researchss on the compressibility of gases ars communicated to the French Academy by M. Cailletst, who makes the anouncement that nitrogen does not exactly follow Mariotte's law. He announces, from his observations, that thie gas is at first more compressible than the law would indicate, and that then its compressibility diminiehes, as he observed to be the case witb atmospheric air. The gas preeents this maximum at a pressure of 70 metere of mercury.

M. S. Mesinier hae made mixtures of iron and nickel chloridee, reduced by hydrogen at a red heat, yield well-defined alloys, sometimes admirably cryetalline, and closely analogoue to the meteoritic alloye of iron and nickel.

Curious Phenomena of Reflection.—The *Engineer* publishes ae interesting paper by Mr. Robert Mallet on sons curious phenomena of reflectiou, which, hs observes, may give a cue to the explanation of the magic mirrors of Japan. Many years ago Mr. Reeks, of ths London School of Mines, noticed that the image reflected in bright suulight from a silver coiu, which hy abrasion of wear had become practically flat, and from which all traces of image and superscriptiou had vauisbed, was different, in the intensity of the light reflected, from what had ouce been the field or depressed part aud from the head. A silver half crown was struck at the Royal mint showieg the Queen's head on the ohverse side, but without any design on the reverse face, where a flat surface of polished steel was placed in the coining press ie place of the usual reverse die. When this flat and polished side was exposed obliquely to bright sunlight, ths reflected image thrown upon a flat surface not only preseutsd witb much distinctnessaud accuracy the outline of ths head, but also a portiou of the "Victoria" surrounding it, the head aud inscription beieg shown by a far more brilliant light than the rest. This suggests some interesting inquiries iu regard to the flow of metals.

A New Nebula and a Lost Planet.—Dr. Temple, of the Observatory of Arcstri, Floreuce, announces his discovery, on March 14th, of a new neubla, which he at first mistook for a faiut comet. Ite position for 1879 is R. A., 11h., 18min., 5scc., N. P. D., 86° 1'-4. Dr. Temple describes it as a doubls nehula with two small but distinct nuclei from 15" to 20" apart, and he adds that nebula Herschel II. 32, which is in the vicinity, is much smaller and faieter than the one just discovered. It occasionally happens that celestial bodies are lost as well as found. This has occurred several times in ths case of the small planets between Mars and Jupiter, which now number nearly 200. There is oue of these, howsver, which, according to Mr. Proetor, astronomers would regret to lose. This is the planet Hilda, which travels in a much wider orhit than any of the others, and can give mors exact informatiou respecting the mass of Jupiter thau any other member of the solar system, comiug much more fully at certain times nuder his iufluence. Unfortunately, Hilda has been searched for in vain at its first return to opposition, and astronomers begin to fear that the planet is, for the time being, lost.

Is Condensed Steam Explosive?—Ths following appears in a Boston daily paper: To economizs heat, it is common to pass ths steam from the cylinder to the tender in a locomotive, to be used again and again. A similar process through the condenser is in vogue on hoard of steamers. For some time Mr. R. C. Blackall, Superintendent of the motive power of the Delaware and Hudson R. Co., has beeu experimenting with this condensed steam, and among other important discoveries, has found that it becomes highly explosive without giving any warning, under certain circumstances, which are liable to occur at any time. He thiuks it probable that some of the missiug ocean steamers have heen hlown up by condeesed steam. Locomotives, he contends, are exposed to the same danger. Now if this is so, Mr. Blackall ought to make it known as extensively as possihle for the safety of life and property.

The perforation of marble by a marine borieg animal (the sponge known as *Cliona sulphurea*) is a novsl fact observed and noted by Prof. Verrill. The facts in ths cass are briefly as follows: A vessel laden with Italian marble was wrecked in 1871, off Long Island, and the exposed portions of ths slabs which occasionally coms to light, are found to he thoroughly penetrated to the depth of an inch or two hy the crooked, irsgular borings of this sponge, and reduced to a complete honeycomb, readily crumhled between the fingers. Beyond these borings the stone is still perfectly sound and unaltered. Prof. Verrill notices this as the first instance recorded where this sponge has attacked limestone, since calcareous rocks do not occur along the portions of our coast inhahited hy it; and he suggests that its demonstrated ability to destroy such rocks so rapidly might have an important practical bearing on the use of limestone structures for submarine works.

Newly Discoveren Fossil Bird Tracks.—The lower Connecticut valley seems to be quits as full of giant fossil bird tracks, in stons, as the upper region about Turner falls, where Prof. Hitchcock made his discoveries. Messrs. Coe & Fowler have just uncovered, in their quarry on Powder hill, half a mile west of the Middlefield and Durham station, a layer of stone indented several inches with bird tracks. Several on a line are thres and one-half feet from each other, and measurs fourteen inches on the center claw, and outside claws heing separated about a foot at the points. These tracks were made in the mud and oozs of a shore that was evidently washed by the tides, and each incoming tids deposited a layer of silt, or mud, which hecame sufficiently hardeued in the sun to retain the form of the impression, and in that ehape ths mud was slowly turned to freestone.—*Hartford, Conn., Times.*

Another New Planet.—The Smithsonian Institution reports, under date of May 23d, the discovery of a new planet of the 12th magnitude. It was discovered, according to the announcement of the Observatory of Paris, by Palisa, at Pola.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 22.		Week Ending May 29.		Week Ending June 5.		Week Ending June 11	
Alpha	23	18	23¼	21½	29½	22¾	32½	28¾
Alta	8⅞	7¼	8¾	7⅜	10	8¾	11⅛	9½
Andes	50c	25c	50c	40c	1.35	50c	1¼	80c
Alps	....	....	....	....	....	....	....	....
Argenta	1.20	70c	1½	90c	1.15	1	1¼	1
Atlantic	....	....	....	....	25c	....	45	35c
Aurora Tunnel	20c	....	30c	20c	....	....	....	....
Baltimore Con	1	50c	....	....	1.35	1	1.30	1
Belcher	6	5	6⅝	5¼	6¼	5⅜	7⅝	5½
Belmont	40c	30c	45c	40c	75c	55c	75c	65c
Best & Belcher	19½	14¾	20½	17¼	22	18⅝	21	19
Bullion	7⅛	4⅞	7½	6¼	8⅞	7¼	11¾	9¼
Bechtel	2	1	2.70	1.60	2.40	1.90	2	1.70
Belle Isle	60c	35c	1	65c	1.40	1	1.40	1.15
Bodie	17¼	12	43	21½	41	36½	45	41
Benton	5	4.35	5½	4.55	7¾	6	8¾	7½
Bulwer	11¾	10¾	13½	11	14½	11½	12¼	11¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.80	1.60	2¾	1.60	2¾	2	3	2
Belvidere	1	75c	2¼	90c	2½	1½	2.10	1.55
Booker	45c	35c	1	30c	1.05	75c	1.10	70c
Caledonia	2.35	2	3	2¼	3.30	2¾	4¾	2.65
California	7⅛	6¾	7	5⅜	7	6½	7¾	6¼
Challenge	2.95	2.60	3	2½	3¼	2	3.40	3
Chollar	7⅝	6⅛	9	6⅞	9⅜	7¾	9	8¼
Confidence	14½	12¼	16	13¾	18⅝	15	16¾	15
Con Imperial	1.65	1.40	1.70	1.45	2	1.65	2.35	1.90
Con Virginia	7⅜	6⅞	7	5¾	6¾	6⅛	7	6⅜
Crown Point	5½	4.60	6	5	6¼	5¼	6⅝	5½
Con Washoe	....	....	....	....	....	....	30c	....
Champion	25c	20c	45c	25c	45c	35c	50c	25c
Concordia	....	....	....	....	30c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	10c	....	10c	5c
Daney	....	....	....	....	....	....	....	....
Day	70c	60c	60c	50c	1½	50c	45c	30c
Eureka Con	18	17½	18	17	18¾	17¾	17	15½
Exchequer	8½	5⅛	8½	7½	9⅝	8	12	9¾
Endowment	25c	20c	25c	....	40c	30c	35c	25c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3¼	3	3.40	3.10	4½	3.45	4	3.60
Gila	20c	15c	20c	15c	75c	15c	75c	85c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	13	15	13	14	13	14	12
Goodshaw	40c	25c	80c	50c	80c	65c	75c	50c
Gould & Curry	10¼	8¾	12¾	9⅝	13	11¼	13½	11⅛
Hale & Norcross	15¼	13½	18	14¼	18½	15½	18	17
Hillside	2¼	2.20	2	1.90	2¼	2	2.95	1.90
Highbridge	35c	25c	....	....	35c	30c	35c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	10c	15c	10c	10c	5c
Independence	2¾	2.60	3	2.80	3.90	3	3⅞	5
Julia	4¼	3.60	4¾	3.70	4¾	4.30	5¼	4½
Justice	3.85	3.15	3¾	3.30	4.85	3.80	4¾	4.30
Jackson	6	....	6	5½	6	5½	5½	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5	4	5½	4½	6	5⅛	5⅞	5
Kossuth	10c	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	70c	50c	80c	65c	2	70c	1.45	1¼
Lady Wash	1.45	1½	1.40	1¼	1.95	1.60	3	2
Leopard	1.40	1	1	....	1	65c	80c	65c
Leviathan	75c	55c	75c	70c	80c	55c	75c	70c
Leeds	75c	60c	80c	70c	75c	....	1	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	50c	....	50c	30c
Modoc	....	....	....	....	1¼	10c	1¼	1
Manhattan	2½	2.30	2.40	2¼	2.35	2¼	2⅜	2¼
Martin White	....	....	6¾	....	6½	....	6½	6
McClinton	1	60c	1.80	1	1½	1¼	1⅜	1.20
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	37¾	34	43	40	45½	42	45	39
Mides	....	....	....	....	....	....	1½	....
Morning Star	....	....	....	....	3	....	3	....
North Con Virginia	10½	9⅜	10⅞	10	11	9	9½	8¾
New York	70c	55c	65c	60c	1	65c	1¼	90c
Northern Belle	7	6¼	6¾	6	7	6⅞	6¾	6½
New Coso	....	....	....	....	....	....	....	....
Navajo	20c	15c	25c	15c	50c	25c	45c	35c
Occidental	....	....	....	....	60c	50c	1	85c
Ophir	42	35½	40	37	39½	37¼	36¾	32½
Oriental	90c	50c	95c	60c	65c	....	75c	70c
Overman	10	8⅛	11⅞	8¾	12	10½	12½	10¾
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	3½	....	3	2½	2½	....
Phil Sheridan	85c	60c	1	25c	1	75c	90c	50c
Potosi	4.90	3½	5½	4.60	6¼	5½	7	5¾
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3¼	2¾	4¾	3	6½	4¼	5	4½
Richer	60c	....	....	....	80c	....	65c	60c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13½	11½	17	12½	17½	15	16¾	15½
Seg Belcher	27	26	....	....	....	....	28	25
Sierra Nevada	50¼	44½	54	47	56¾	51½	56	48
Silver Hill	2½	2.05	2½	2	3	2¼	3	2.40
Silver King	8¼	8⅛	....	....	8	7	....	....
Silver Prize	....	....	50c	....	50c	40c	....	....
Succor	55c	20c	90c	25c	1	80c	90c	70c
Summit	2	1⅛	3	1¾	2½	2	2¼	2
Scorpion	4.10	2.60	3.85	2¾	3¾	3	3.40	2.10
Solid Silver	15c	....	15c	5c	20	10	20c	10c
South Bodie	50c	35c	50c	35c	65c	40c	45c	40c
South Standard	....	....	....	....	25c	20c	50c	20c
Star	50c	....	50c	35c	60c	25c	40c	35c
St. Louis	30c	....	....	....	....	....	50c	....
Syndicate	3¼	2.90	4¼	3¾	4½	3.45	5	3½
Tioga Con	3.30	2.30	4	2.20	3.90	3¼	4	3
Tiptop	85c	75c	80c	70c	90c	75c	1¾	95c
Trojan	30c	20c	35c	25c	40c	25c	85c	30c
Union Con	77	68½	90	80	97	87	99	75½
Utah	19½	14	32	18¼	31	24	28	23
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.30	1	1.30	1.10	1½	1¼	2	1¼
Wells-Fargo	5c	....	....	....	30c	25c	40c	25c
Woodville	....	....	25c	....	50c	25c	40c	30c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	19	15⅝	21¾	17½	21½	20	21¼	20¼

Sales at S. F. Stock Exchange.

Friday A. M., June 6.
440 Alta....10¼@10⅜
145 Alpha....28¾@28½
1105 Andes....90@80c
100 Baltimore Con....1
196 Belcher....5½
720 Bullion....9¾@9½
505 Best & Belcher....20@20¼
670 Benton....7¾@7⅞
700 C Dorado....2½@2.30
490 Con Virginia....6¾
40 Chollar....8¾
665 California....6¾
220 Caledonia....2¾@2.90
120 Challenge....3@3.10
335 Crown Point....6⅜@5½
200 Cosmopolitan....45c
100 Confidence....15¼@15
4180 Con Imperial....1.95@2
2880 Exchequer....9¾@9⅞
400 Flowery....90@85c
315 Gould & Curry....12¼@12⅜
350 Hale & Nor....17¾@17¼
700 Julia....4.60@4.55
400 Justice....4⅜@4.30
90 Kentuck....5
650 Lady Bryan....1.45@1.40
500 Leviathan....70@75c
795 Lady Wash....2
300 Mexican....43½
675 Mackey....2@2.10
200 Mount View....2¼
760 N Bonanza....2½@2.40
820 New York....90c@1
90 North Con Vir....9⅜@9
500 N Sierra Nevada....10c
70 Overman....10⅞
580 Ophir....36¾@36¼
250 Potosi....5¾@5½
30 Pioneer....30c
500 Solid Silver....15c
30 Savage....16½
920 Silver Hill....2.85@3
200 Succor....70c
425 Sierra Nevada....54@53¾
905 Scorpion....3¾@3.45
10 Trojan....35c
265 Utah....25@25½
220 Union Con....91@92
250 Ward....1¼@1.30
100 Woodville....40c
195 Yellow Jacket....20¼@20½

AFTERNOON SESSION.
650 Adenda....65@75c
1400 Argenta....1½@1.05
100 Albion....30c
1050 Belle Isle....1.15@1¼
250 Bodie....41@41½
1345 Bechtel....1¾@1.90
1375 Booker....85@70c
540 Belmont....70c
625 Black Hawk....2@2.10
65 Bulwer....12@12¼
770 Belvidere....1.80@1.55
850 Champion....40@35c
100 Caledonia (B H)....4¼
215 C Pacific....6¼@6
1000 Day....40@30c
545 Dudley....1.20
155 Eureka Con....17½@17
650 Fourth July....80@85c
285 Grand Prize....4.10@4
50 Golden Terra....12
1150 Gila....70@75c
100 Goodshaw....50c
345 Hillside....2@1.95
100 Hussey....10c
100 Hamburg....50c
325 Highbridge....30@35c
400 Independence....3¾
250 Jackson....5½
950 Jupiter....1½@1.20
750 Mammoth....15@12
200 Manhattan....2.35
20 Martin White....6¼
445 Mono....8¾@8⅝
350 Modoc....1¼@1.15
900 McClinton....1¼@1.10
50 Northern Belle....6¾@6⅞
340 Noonday....2¾@2.60
300 N Noonday....90c
750 Navajo....35@40c
1200 Orient....20c
75 Paradise....1.60@1.55
240 Richer....65@60c
55 Raymond & Ely....5@4.90
150 Red Cloud....50c
510 Summit....2@2¼
900 S Bulwer....1⅜@1.30
100 Syndicate....3¾
150 S Bodie....45c
1300 S Standard....25@20c
720 Tioga Con....3@3.10
1150 Tiptop....95c@1
100 Tuscarora....10c
1000 University....70@75c
600 Vortex....95c@1

Saturday A. M., June 7.
100 Albion....25c
170 Alpha....29@29½
445 Alta....10¾
1175 Andes....95c@1.10
645 Argenta....1.05@1.10
1250 Adenda....75@65c
40 Best & Belcher....19½@19¾
290 Belcher....5¾@5⅞
450 Baltimore Con....1¼@1
1260 Bullion....9⅞@9½
305 Benton....7⅞@8
1200 Belle Isle....1¼
490 Bodie....41½@41
810 Bechtel....1.70@1¾
1025 Bulwer....12¼@12
70 Black Hawk....2.40@2¼
900 Booker....70c
615 Belvidere....1¾@2
600 Belmont....70c
200 Caledonia....2¾@2.95
765 California....7@7⅛
580 Con Virginia....6⅞@7
360 Chollar....8½@8¾
445 Crown Point....5¾@5⅝
890 Con Imperial....1.90@2
5 Confidence....15½
160 Challenge....3@2.95
700 Cosmopolitan....40c
770 Con Dorado....2.40@2½
200 Champion....25c
100 C Pacific....6¼
200 Caledonia (B H)....4¼
500 Dudley....80c
1300 Day....45c
565 Exchequer....9¾@9⅞
100 Erie....60c
10 Eureka Con....17
835 Flowery....95@90c
100 Fairfax....75c
295 Gould & Curry....12½@12¾
190 Golden Terra....11
35 Grand Prize....4
300 Goodshaw....50c
120 H & Norcross....17⅞
250 Hussey....10c
300 Hamburg....40c
30 Hillside....2.95@2
750 Independence....3½
380 Justice....4.20@4¼
265 Julia....4½@4.60
350 Jupiter....1.10
115 Kentuck....5½
828 L Wash....2.40@2.60
1410 L Bryan....1.30@1¼
400 Leviathan....70c
865 Leopard....65@70c
230 Mexican....43½
100 Morning Star....3
525 Mackey....2.10@2
175 Mountain View....2¼
10 Manhattan....2.30
500 McClinton....1¼@1.20
50 Modoc....1
520 Mono....9¼@9
145 Mammoth....10½
100 M White....6
450 New York....95c
590 N Bonanza....2.45@2.30
415 N Con Virginia....9
900 Navajo....40c
1420 Noonday....2.70@2.90
280 Ophir....36¾@36½
600 Orient....20c
125 Overman....11@10¾
200 Pioneer....20c
200 Plutus....1½@1.60
100 Potosi....5¼
1360 Paradise....1.55@1.60
185 Raymond & E....5
115 Savage....16⅜@16½
355 Scorpion....3.40@3.10
175 Sierra Nevada....54
170 Silver Hill....2¾@2.80
100 Senator....20c
1500 Solid Silver....10c
35 Syndicate....3½
125 Summit....2.05
525 South Bodie....45@40c
590 S Bulwer....1¼@1.10
280 Trojan....35@30c
330 Tioga....3@3.15
550 Tiptop....1.10@1.15
25 Utah....26@25
95 Union Con....90@92½
600 University....75@70c
600 Vortex....95c@1
1375 Ward....1¼
100 Woodville....30c
395 Yellow Jacket....20¼@20¼

Monday A. M., June 9.
130 Alpha....31@32½
240 Alta....10¼
100 Atlantic....40c
590 Andes....1¼@1.15
1640 Benton....8@7⅞
880 Bullion....10¾@11¼
640 Belcher....5⅞@6
250 Best & Belcher....20
285 California....7
10 Confidence....16
1195 Con Virginia....6⅞@7
370 Chollar....8½@8¾
4655 Con Imperial....2.05@2.35
795 Crown Point....5⅝@5½
360 Caledonia....2.90@3
850 C Dorado....2½@2.60
545 Challenge....3.40@3.35
100 Cosmopolitan....40c
1330 Exchequer....12@11⅞
650 Erie....75c
200 Flowery....95c
400 Fairfax....1
230 Gould & Curry....12¼
230 Hale & Nor....18½@18¼
260 Julia....4¾@4.85
520 Justice....4¼
625 Kentuck....5¾@6
805 Lady Wash....2¾@2.80
805 Lady Bryan....1.40@1.45
300 Leviathan....75@70c
475 Mexican....43½@45
100 Maryland....50c
700 Mackey....2.10@2.15
300 Mountain View....2½@2.35
545 N Bonanza....2.45@2.35
1490 North Con Vir....9@9⅛
2010 New York....95c@1
100 N Sierra Nevada....15c
255 Ophir....36¾
75 Overman....11¼
100 Occidental....95c
15 Phil Sheridan....50c
750 Potosi....6⅞@7
200 Plutus....65@70c
280 Scorpion....3¼
200 Silver Hill....2.90
205 Savage....16½@16⅝
45 Seg Belcher....25
50 Succor....90c
200 Sierra Nevada....55½@56
750 Solid Silver....15@20c
200 Trojan....35@30c
160 Union Con....97@99
125 Utah....23@27½
100 Wells-Fargo....30c
1450 Ward....1.45@1.35
185 Yellow Jacket....20¾@20⅞

AFTERNOON SESSION.
1400 Adenda....75@70c
1315 Argenta....1.05@1
200 Albion....25@30c
480 Black Hawk....2.65@3
420 Belvidere....2.10@2
200 Bulwer....12@11¾
265 Bodie....46@47
300 Belmont....65c
520 Belle Isle....1.40@1.35
1030 Bechtel....2@1.90

1520 Booker....90c@1
200 Caledonia (B H)....4¼
500 Champion....35c
2400 C Pacific....7@7½
100 Chieftain....10c
2720 Dudley....1¼@1½
250 Day....45@40c
150 Defiance....1½@1.40
225 DeFrees....5c
235 Eureka Con....17@15½
100 Fourth July....90@95c
275 Goodshaw....50@60c
1715 Gila....75@65c
100 Grand Prize....3.80@3.60
250 Golden Terra....12½
170 Hussey....5c
60 Hillside....2
400 Hamburg....50c
75 Highbridge....25c
375 Independence....3½@3
425 Jupiter....1.20@1.30
200 Leeds....1
50 Leopard....80c
370 Mono....12@12½
770 McClinton....1⅜@1.40
50 Manhattan....2.30
20 Modoc....1
615 Mammoth....13@13½
30 M White....6
10 Northern Belle....6¾
2160 Noonday....3@3.10
400 N Noonday....90c@95c
450 Navajo....35@40c
900 Orient....20c
200 Paradise....1.65@2
90 Real del Monte....2
170 Raymond & Ely....4¾@4½
1675 S Bulwer....1.45@1½
300 Star....40c
660 Syndicate....4½
750 S Bodie....45@40c
200 South Standard....25@20c
670 Summit....2.10@2
445 Tioga Con....4@3.90
1625 Tiptop....1½@1.55
1950 University....80@90c
300 Vortex....95c@1

Tuesday A. M., June 10.
1430 Andes....1¼@1.15
675 Alta....11@11¼
70 Alpha....31
1400 Atlantic....40@35c
895 Benton....8¾@8⅞
500 Baltimore Con....1.05@1
1075 Bullion....11¼@11½
1985 Belcher....6@6½
195 Best & Belcher....21
825 California....6¾@6¼
460 Caledonia....2.95@3
830 Con Virginia....6⅞@7
1045 Chollar....9@8⅞
85 Confidence....16½@16¾
2870 Con Imperial....2.30@2¼
470 Crown Point....5¾@6
500 Cosmopolitan....50c
850 Con Dorado....2.30@2⅜
630 Challenge....3¼@3.35
1565 Exchequer....11¼@11½
380 Flowery....85@80c
780 Gould & Curry....13¾@13½
300 Green....1½
325 H & Norcross....18@17¾
1160 Justice....4.40@4.55
620 Julia....5@5¼
150 Kentuck....5½
660 L Bryan....1.30@1½
400 Leviathan....70@75c
1055 Lady Wash....2¾@3
615 Mexican....43@43½
140 Mt View....2½
475 Mackey....2¼@2.15
515 North Con Vir....9@9⅛
1350 New York....1¼@1.20
680 N Bonanza....2¼@2.40
145 Overman....11½
1165 Ophir....36½@36
70 Occidental....1
1000 Pioneer....20c
320 Phil Sheridan....80c
820 Potosi....6⅞@6½
200 Plutus....1.65@1.70
10 Seg Belcher....25
345 Sierra Nevada....53@52¾
460 Silver Hill....2¾@2.90
130 Savage....16¾@16⅝
150 Succor....80@75c
490 Solid Silver....20c
690 Scorpion....3@3.30
800 Trojan....35c
210 Utah....26@25
1040 Union Con....90@88½
2700 Wells Fargo....25@40c
430 Ward....1.60@1¾
300 Yellow Jacket....21¼@21

AFTERNOON SESSION.
100 Albion....20c
750 Addenda....70@75c
1555 Argenta....1@1.05
865 Belmont....70@75c
985 Belle Isle....1.30@1.35
45 Bulwer....11¾
450 Bodie....45@44½
925 Bechtel....1.85@1.90
2125 Booker....1@1.10
735 Belvidere....1.90@2½
700 Black Hawk....2½@2.60
2100 C Pacific....8¼@8½
2425 Champion....45@35c
1000 Caledonia (B H)....3
400 Chieftain....10c
1700 DeFrees....5c
3050 Day....45@40c
1610 Dudley....1.30@1½
1600 Defiance....1½
180 Eureka Con....15½
350 Endowment....35c
905 Gila....70@65c
85 Grand Prize....3¾
700 Goodshaw....75@65c
30 Golden Terra....13
100 Highbridge....30c
100 Hamburg....50c
50 Hillside....1.90
1685 Independence....3
150 Jackson....5½
1135 Jupiter....1.55@1¼
20 Leopard....80c
270 Leeds....50c@1
210 Manhattan....2¼@2.35
320 McClinton....1@1.40
150 Modoc....1
850 May Belle....50@40c
315 Mono....12¼@12½
125 Martin White....6@6¼
60 Northern Belle....6½
1330 Navajo....40@45c
1680 Noonday....3¼
350 N Noonday....90c
500 Oriental....75c
20 Orient....30c
150 Phenix....2½
1600 Paradise....2@1.95
100 Queen Bee....40c
170 Raymond & Ely....4½
600 Star....40c
350 Syndicate....4½@5
670 Summit....2¼@2.10
800 S Bodie....45c
1530 S Bulwer....1.40@1½
475 S Standard....25@20c
1600 Tuscarora....10c
20 Tioga....4
1660 Tiptop....1½@1¾
525 University....70@60c
400 Vortex....95c@1
500 Wales....2@2.05

Wed'sday A. M., June 11.
195 Alpha....30
550 Atlantic....40c
770 Andes....1
300 Alta....10
1935 Benton....7¾@7⅞
1115 Bullion....9½@9¾
725 Belcher....6¼@6¾
195 B & Belcher....19¾@19
500 Baltimore Con....1@1.15
265 Caledonia....2.70@2.65
1050 California....6½
400 Confidence....15@15½
2060 Con Imperial....2.20@2.15
435 Crown Point....6⅛@5¾
330 Con Virginia....6½@6¾

300 Cosmopolitan....60c
330 Chollar....8½@8⅜
750 Con Dorado....2.60@2.70
470 Challenge....3@2.85
325 Erie....60c
1770 Exchequer....9¾@10
750 Fairfax....1
780 Flowery....80@85c
200 Geo Douglas....50c
280 Gould & Curry....12½@11¾
360 Hale & Nor....17@17½
315 Julia....4.90@4.85
435 Justice....4½@4.15
420 Kentuck....5½@5¼
655 Lady Bryan....1.40@1¼
220 Leviathan....70@75c
605 Lady Wash....2.40@2.60
1085 Mexican....39@40
690 Mackey....2½@2.15
200 Mt View....2.40
200 Maryland....50c
130 North Con Vir....9@8⅞
2440 New York....1.10@1
820 N Bonanza....2.20@2½
130 Overman....11
1120 Ophir....34@32½
440 Occidental....1
730 Potosi....6¼@5⅞
20 Plutus....1.70
230 Phil Sheridan....90c
725 Silver Hill....2½@2.40
205 Savage....16@15½
150 Solid Silver....15c
625 Succor....80@75c
10 Seg Belcher....25
570 Scorpion....3@2.90
785 Sierra Nevada....50@49½
50 Utah....23
685 Union....82@81
350 Wells-Fargo....25@30c
3160 Ward....1.40@1.65
510 Yellow Jacket....20½@20¼

AFTERNOON SESSION.
1725 Addenda....70@80c
300 Albion....25c
6 0 Argenta....1.05
855 Black Hawk....2½@2.40
2310 Booker....1@1.05
960 Belvidere....1.90@2
235 Bulwer....11¾@11¼
1310 Bechtel....2@1¾
595 Bodie....45@43¾
330 Belmont....70c

2550 Belle Isle....1.30@1¼
755 Caledonia (B H)....3¾@4¾
1290 Con Pacific....8½@9
850 Champion....45@50c
100 Crœsus....10c
1280 Day....45@40c
500 DeFrees....10c
1200 Defiance....1½
450 Dudley....1.40@1½
205 Eureka Con....15¾
100 Endowment....25c
1550 Fourth July....80@70c
1160 Goodshaw....70@75c
400 Golden Terra....14
190 Glynn Dale....1
1835 Gila....70@75c
210 Grand Prize....3.90@4
500 Hussey....10c
150 Hamburg....50c
150 Hillside....1.90
800 Highbridge....30@25c
235 Independence....3.15@3¼
10 Jackson....5½
300 Jupiter....1½@1¼
200 Leeds....90c
300 Leopard....75c
45 Mammoth....13@12¾
600 May Belle....30c
855 Mono....11@11¼
270 McClinton....1.40@1¼
20 Modoc....1
565 Manhattan....2¾@2.30
435 Noonday....3¼
5 Northern Belle....6¼
3050 N Noonday....1
200 Navajo....45c
600 Oriental....70@75c
150 Orient....20c
700 Paradise....1.95@2
400 Queen Bee....50c
185 Raymond & Ely....4.90@5
1340 S Bulwer....1½@1.45
745 Syndicate....4½@4¾
1275 S Bodie....45c
900 South Standard....50c
595 Summit....2.10@2¼
300 Star....35@40c
400 Tuscarora....10@15c
950 Tioga Con....3.80@4
210 Tiptop....1.30@1¼
475 University....65c
500 Vortex....90@95c
50 Wales....2½

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., June 5.
195 Alta....9¼
155 Alpha....29@29½
1125 Andes....80@90c
250 Best & Belcher....20½@21
870 Bullion....8¾@8⅞
165 Belcher....5⅞@5½
360 Benton....6½@7
180 Confidence....15½@15
120 California....6¾
100 Chollar....8¾
355 Con Virginia....6¾
260 Crown Point....5¾@5⅝
2435 Con Imperial....2
170 Challenge....3.20
560 Caledonia....2¾@2.90
1300 Cosmopolitan....45@40c
1290 Con Dorado....2.80@2
1460 Exchequer....9¾@9⅞
400 Erie....50c
300 Flowery....90c
805 Gould & Curry....12¾
350 Hale & Nor....18@17¾
410 Julia....4.60@4.65
1420 Justice....4½@4.05
80 Kentuck....5¼
570 Lady Bryan....1.20@1¼
540 Lady Wash....1.80@1.85
450 Leviathan....75@80c

Thursday A. M., June 12.
125 Alpha....30½
365 Alta....9¼@9¾
955 Andes....1.05@1.20
100 Atlantic....45c
185 Best & Belcher....19½
1000 Bullion....9¾@9½
1305 Belcher....7¼@7¾
900 Baltimore Con....1.20@1.30
125 Benton....7½
210 Challenge....3@3.10
725 California....6½@6¾
3920 Con Imperial....2.40@2.35
875 Chollar....9
640 Con Virginia....6¼@6⅜
1050 Crown Point....6⅛@6¼
490 Confidence....15½@16
1180 Caledonia....3¼@3.35
500 C Dorado....2¾
100 Cosmopolitan....50c
200 Con Washoe....30c
845 Exchequer....10@9⅞
100 Erie....55c
430 Flowery....85@90c
300 Fairfax....1@1.10
175 Gould & Curry....13@12¾
500 Green....1½
200 Geo Douglas....55c
180 Hale & Nor....17½@17¾

295 Mexican....44
100 Morning Star....3
350 Mt View....2¼@2.10
570 Mackey....2.05@2
450 New York....85@95c
150 N Sierra Nevada....15c
535 North Con Vir....9
640 N Bonanza....2.15@2¼
245 Ophir....37¾@37½
85 Overman....11
180 Potosi....6½
20 Plutus....1.35
50 Pioneer....20c
55 Savage....16¾@16½
245 Sierra Nevada....54¼@54¾
640 Silver Hill....2.70@2.80
200 Senator....20c
1480 Scorpion....3.40@3¼
400 Solid Silver....15@20c
310 Trojan....25@35c
200 Utah....28@26½
20 Union Con....92@91
550 Woodville....40@50c
850 Wells-Fargo....30c
570 Ward....1.35@1½
295 Yellow Jacket....20⅜@20¼

AFTERNOON SESSION.
785 Argenta....1.10@1.0
550 Albion....30c
500 Adams Hill....1
600 Addenda....75@80c
380 Belmont....70c
120 Bodie....38½@39
280 Bechtel....1¾@1.85
625 Belle Isle....1.15@1
550 Booker....90@95c
1110 Black Hawk....2@2.0
805 Bulwer....13@12
365 Belvidere....1¾@1.80
570 Champion....40c
800 Caledonia (BH)....4¼@4¾
1000 Chieftain....10c
1000 Crœsus....10c
495 C Pacific....6½@6¾
1295 Day....55@50c
100 DeFrees....10c
100 Defiance....1½
545 Dudley....90c@1
150 Endowment....30c
140 Eureka Con....17¼
50 Fourth July....80c
425 Grand Prize....4@4¼
1300 Gila....65@75c
160 Giant & O A....6¾
950 Goodshaw....60@55c
830 Hillside....2@1.95
650 Hussey....10c
475 Highbridge....30c
555 Independence....3¾@3.85
240 Jackson....5½
1200 Jupiter....95c@1¼
1480 Leopard....70@65c
30 Leeds....75c
325 McClinton....1.30@1¼
1005 Mono....8½@8¾
950 Modoc....1¼
235 Mammoth....14
10 Martin White....6
10 May Belle....50c
145 Manhattan....2.35@2¼
60 Northern Belle....7@6½
2000 Navajo....35c
2000 Noonday....2.90
1875 N Noonday....1
350 Orient....20c
400 Paradise....1½
50 Phenix....2¼
230 Raymond & Ely....4¾@4.60
50 Richer....70c
130 Red Cloud....45@60c
490 Summit....2@2¼
1150 S Standard....25c

685 Justice....4.40@4½
490 Julia....5@5¼
370 Kentuck....5¾@5⅛
750 Leviathan....75@60c
1125 Lady Wash....2½
560 L Bryan....1.45@1.40
975 Mexican....40@39
1180 Mackey....2.15@2¼
200 Mt View....2.40
300 Mides....1½
450 Maryland....60@45c
750 New York....1¼@1.20
135 N Con Vir....8¾@8⅞
500 North Sierra Nev....15c
720 N Bonanza....2.10@2.15
1220 Ophir....32½@34¼
410 Overman....12@12½
75 Occidental....1@85c
100 Phil Sheridan....75c
515 Potosi....6⅞@6½
100 Plutus....1½
265 Savage....16@15⅞
25 Succor....80c
95 Seg Belcher....28
540 Sierra Nevada....49½@48
615 Silver Hill....2¼@2.40
150 S Potosi....60c
025 Scorpion....3@2.95
875 Solid Silver....15@20c
100 St Louis....50c
65 Utah....24
135 Union Con....80@75½
50 Woodville....35c
540 Ward....1½@2
570 Yellow Jacket....20¾@20½

AFTERNOON SESSION.
400 Albion....20@25c
2000 Addenda....75c@70c
750 Argenta....1.05@1.15
370 Booker....1@90c
445 Black Hawk....2¼
575 Belvidere....2@2.05
20 Bulwer....11¼
430 Bodie....44½@44
170 Bechtel....2@1.80
2530 Belle Isle....1.30@1.35
50 Belmont....70c
680 Champion....45@55c
310 Caledonia (B H)....4¼@4½
360 C Pacific....8¾@8⅞
225 Day....40c
200 Double Standard....50c
2950 Dudley....1.30@1½
500 DeFrees....10c
150 Defiance....1½
90 Eureka Con....15¾
800 Fourth July....85@80c
1070 Goodshaw....75c
1030 Gila....80@75c
600 Glen Dale....1
800 Hamburg....50c
1000 Highbridge....25c
100 Hillside....1½
100 Hussey....10@5c
675 Independence....3¼@3.10
200 Jackson....6
1815 Jupiter....1¾@1.90
550 May Belle....30c
90 Mammoth....11½
1815 McClinton....1.40@1.20
150 M White....6½
85 Mono....11⅞@12
270 Manhattan....2½@2.40
820 Noonday....3¼@3.20
640 N Noonday....1.10@1
150 Navajo....40@35c
100 Northern Belle....6½@6¾
400 Orient....20c
100 Paradise....1.95
125 Queen Bee....60@55c
10 Real del Monte....2
10 Raymond & Ely....5
250 Red Cloud....75c
140 Syndicate....4¾@5
100 Star....40c
715 Summit....2.30@2.20

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Bodie G M Co	California	2	1 00	Apr 23	May 30	June 19	Wm H Lent	309 Montgomery st
Booker Con G M Co	California	2	25	Apr 28	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkelen	419 Cal st
Bechtel Con M Co	California	2	25	Apr 19	May 26	June 16	Wm H Lent	309 Montgomery st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
North Carson S M Co	Nevada	8	25	Apr 26	June 2	June 20	J W Morgan	318 Pine st
N Comstock S M Co	Nevada	1	05	May 30	July 2	July 23	D L Thomas	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
Trojan M Co	Nevada	10	25	Apr 9	June 2	June 23	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Succor M & M Co	Nevada	23	50	Apr 23	May 28	June 17	Wm H Watson	302 Montgomery st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Trojan M Co	Nevada	10	25	April 9	June 2	June 23	David Wilder	328 Montgomery st
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st
Yellow Jacket S M Co	Nevada	32	1 00	Apr 15	May 19	June 17	Mercer Otey	Gold Hill, Nev

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
America M Co	Nevada	1	25	May 9	June 11	June 28	R B Noyes	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 1	Jno Crockett	203 Bush st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Pine st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Champion M Co	California	3	15	Apr 15	June 6	July 7	Jno Crockett	203 Bush st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 25	F A McGee	Merchants' Ex
Goodshaw M Co	California	3	10	Apr 23	May 30	June 20	Victor Fernbach	327 Pine st
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Mayflower S M Co	Nevada	1	05	Apr 1	June 6	June 30	J W Pew	310 Pine st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Occidental Con Grav M Co	California	1	07	May 19	June 23	July 12	W T Smith	402 Montgomery st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Queen Bee M Co	California	3	10	April 22	May 26	June 16	T A White	113 Leidesdorff st
Rocky Point M Co	California	1	10	Apr 17	May 29	June 16	T L Bibbins	314 Bush st
Seg Europa M Co	Nevada	1	25	Apr 4	June 27	July 14	R B Noyes	240 Montgomery st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Sophia G M Co	California	1	02½	Apr 23	June 5	June 23	L L Blood	Merchants' Ex
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
American Flat M Co	Nevada	C A Sankey	331 Montgomery st	Special	June 19
Baltimore Con M Co	Nevada	C A Sankey	331 Montgomery st	Special	June 19
Con Washoe M Co	Nevada	L Hermann	220 Sansome st	Annual	June 17
George Douglass M Co	——	W W Bausman	409 California st	Special	June 18
Maryland M Co	——	C A Sankey	331 Montgomery st	Special	June 19
McCrackin Con M Co	Arizona	H A Whiting	211 Sansome st	Special	June 19
Mitchell G & S M Co	——	A C Hammond	401 California st	Annual	June 17
Mammoth M Co	——	A W Rose, Jr	302 Montgomery st	Annual	June 17
Rock Island G & S M Co	Nevada	R N Van Brunt	318 Pine st	Special	June 18
Vanderbilt M & M Co	——	J Morizio	328 Montgomery st	Annual	June 19

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
California M Co	Nevada	C P Gordon	123 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

350	S Bodie	40@50c	490	S Bulwer	1.45@1.35
2615	S Bulwer	1¼@1.40	600	S Standard	25@30c
320	Star	40@35c	1150	S Bodie	45@40c
800	Tiptop	90c	450	Silver King	8
50	Tuscarora	15c	1300	Tiptop	1.35@1.10
625	Tioga Con	3½	830	Tioga Con	3.95@3.85
3950	University	70@65c	1100	University	75@60c
600	Vortex	95c@1	700	Vortex	90c@1

Pacific Board—Latest Sales.

Wed'sday A.M., June 11.			AFTERNOON SESSION.		
120	Alta	10@10½	10	Andes	1.05
710	Belcher	6¾@6.45	20	Black Hawk	2½
80	Best & Belcher	19¼@19	100	Bullion	10
320	Bullion	9½	175	Belvidere	2¼
75	Caledonia	2.70@2¼	85	Benton	8½@8
130	California	6¼@6½	110	Caledonia	2.95@2.90
50	Challenge	3	70	California	6½@6¾
230	Camero	3¼@3.15	30	Confidence	15¼
965	Con Imperial	2.15@2.20	440	Con Imperial	2¼@2.30
140	Con Virginia	6½@6¼	50	Crown Point	0.05@6¼
310	Crown Point	5¼@5½	30	Exchequer	10¼@10¼
440	Exchequer	10¼@10	20	Flowery	90c
180	Gould & Curry	12¾@11¾	40	Gould & Curry	12¼@12¾
170	Hale & Nor	17¼	100	Julia	5.05@5¼
690	Julia	5@4.90	260	Justice	4.35@4¼
150	Justice	4¼@4.40	90	Lady Wash	2.60@2.90
70	Mexican	39½@39¼	10	Mexican	41¼
150	New York	1.05@1	70	Mono	12@11¾
190	Ophir	31¼@32	690	New York	1.05@1¼
20	Overman	11	200	N Standard	2¼@1.15
70	Potosi	5½@6¼	20	N Bonanza	2½
50	Savage	15½@15¼	10	Ophir	31¼
50	Sierra Nevada	50@49¼	100	Overman	11¾
90	Summit	2½	1000	Succor	85c
150	S Utah	28c	300	Solid Silver	15c
10	Utah	24¼	40	Silver Hill	2.55
70	Union Con	82@81	100	Trojan	34c
170	Ward	1.60@1.65	20	Union Con	86
100	Woodville	50c	10	Utah	25
70	Yellow Jacket	20¼	360	Ward	1¾@1.70
			10	Yellow Jacket	20¼@20

California Board—Latest Sales.

Wed'sday A.M., June 11.					
100	Atlantic	45c	40	Alpha	30
950	Ætna	35c	60	Alta	10¾@10¼
20	Alpha	30	40	Belcher	5¾
40	Alta	10@10¼	20	Best & Belcher	20@19¾
200	Brilliant	30@40c	40	Bullion	9¼@9¾
50	Belcher	6¾@6½	50	California	6¾
10	Best & Belcher	20¼	30	Con Virginia	5¾
50	Bullion	9¼@9½	300	Con Imperial	2¼@2.30
40	California	6¾	40	Crown Point	6
50	Con Virginia	6¾	30	Chollar	8½
300	Con Imperial	2.20@2¼	60	Challenge	3.10@3.15
40	Crown Point	5¼	60	Caledonia	2.85@2.90
80	Chollar	8¼@8½	600	Coso Con	14@12½c
500	Cosmopolitan	65c	80	C Pacific	8¾
70	Challenge	3¼@3.05	70	Exchequer	10¼@10¾
80	Caledonia	2¾@2.80	150	Gila	70c
200	Dayton	10c	70	Gould & Curry	12¼@12¾
50	Exchequer	10¼@10½	50	Glynn Dale	40c
50	Gould & Curry	12¼@12¾	40	Hale & Nor	17¼@17¾
140	Julia	5@5.05	60	Julia	5@5.10
70	Justice	4.30	90	Justice	4.45@4.35
50	Kossuth	15c	40	Lady Wash	2.55
170	Leviathan	70c	30	Mexican	41½
100	Mint	15c	100	Monumental	5c
50	Mexican	39¾@39¼	100	N Sierra Nevada	11c
300	N Sierra Nevada	11c	40	Ophir	33¾@33¾
50	Ophir	35@35¼	50	Potosi	6¾@6¾
70	Sierra Nevada	49¼@49¼	110	Phil Sheridan	80c
1300	S Utah	7@25c	500	S Utah	25c
40	Union	85@85¼	30	Savage	16½
			20	Silver Hill	2.55
AFTERNOON SESSION.			950	Tiger	55@60c
300	Almaden Q	45@50c	100	Ward	1.60
650	Ætna	35c	75	Wales	2¼@2¾
			20	Yellow Jacket	20½

Mining Share Market.

In spite of the fluctuations of the stock market, there is a general feeling that a good market exists, and that the tendency is towards improvement. With an upward tendency early in the week, a slight decline was experienced toward the close. The cause originates in the contest between Comstock and Bodie. In this contest between really notorious interests, it is to be hoped that wildcat and comparatively worthless stocks will be crowded out. These are naturally more active and seductive when leading stocks decline, because of some interior commotion. It cannot be denied that the market shows feverish symptoms, but there need not be any apprehensions on this account, indeed, with the disappearance of the symptoms a healthy re-action will set in, and an active market is anticipated within the next 50 days. The immediate future is rendered more forbidding by the bears, who luckily took the market at its ebb. The rapidly increasing demand for stocks of the Bodie district, caused by the flow of Eastern capital in that direction, causes the manipulation of other stocks to create a diversion in their direction. The attempt of any person to depress our stocks in the East, particularly of the hydraulic and quartz mines, will have no other than a good effect, contrary of course to his intention, in that the extravagance of his assertions will excite inquiry among Eastern capitalists, which can have only one result, viz., satisfactory reports and further investments. New and paying gold mines are being opened in greater number in this State now than at any other time, and in our recent districts we believe there is more wealth in sight than ever before. We must, however, caution our readers against false appearances. In all business enterprises there is bad mingled with good. But a wise determination to examine before investing, will relieve all from the odium of being classed among those credulous ones who seem born to be relieved of their coin by skillful and unprincipled manipulators. The transactions of the Board for the past week may be set down at an aggregate of $3,500,000. Small, of course, in comparison to the activity of former periods. It may be that not one-tenth are *bona fide* sales. So we warn our readers that wildcats seem to monopolize the business at present, and that assessments are being freely levied. And to cautiously draw the line between the value of the mine, and the unprincipled manipulation of the stock.

In Sumatra, when telegraph messages are delayed or fail to be transmitted, it is because the wires are down or won't work, as elsewhere, but it is not attributed to storms. Elephants and tigers upset the poles and monkeys break the wires by taking gymnastic exercises on them.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

The Kelly Mine.—*Dispatch*, June 7: Mr. Owen Kelly, proprietor of the Kelly mine, on Murphy's ridge (formerly known as the McKay & Love mine), will commence work next Monday, running the tunnel in 100 ft further, where he expects to strike the main ledge. The tunnel is already in about 400 ft, and will therefore be about 500 ft in length when completed. He expects to reach the ledge in about six weeks.

From Amador City.—A very serious accident occurred at the Keystone mine last Wednesday, by which two miners, named Angelo Bruno and John Kernick, were seriously injured—the former probably fatally. While drilling a blast hole an old Giant powder cartridge was struck by the drill and exploded.

Hauling Rock. Messrs. Marshall, Lorraine & Quester are engaged in hauling about 150 tons of rock from their mine, near the Gate, to the Moore mill, to be crushed as a test. It is expected that it will yield a rich return.

Moore.—*Ledger*, June 7: A mishap of a serious nature occurred at this mine last Monday. It must be remembered that to the depth of 200 ft the shaft is an old one. When the water was taken out by the present company it was thought unnecessary to retimber the shaft below water level, as the old timbering was found to be comparatively sound. Atmospheric influences, however, since the shaft has been drained, have caused rapid decay. The company being short of means, naturally staved off the work of retimbering as long as possible. On Monday the timbers gave way, stopping all work in the levels. The extent of the disaster is not exactly known; as although the opening is not entirely closed at any point, which is proven by the pump working freely, still entrance through the shaft is too dangerous to be thought of. The general impression seems to be that the 70 ft of new shaft, sunk by the present company, is uninjured, but that the old shaft will have to be retimbered all the way, except perhaps a few ft from the surface. Retimbering was commenced on Tuesday. It will take probably six weeks to put the shaft in good order. The dump was exhausted of rock Monday night, since which time the mill has been running on ore from a claim at Jackson Gate.

Monterichard.—This mine is in a very prosperous condition. A clean-up was made this week, which yielded about $1,500 over expenses. The liabilities of the company are being gradually liquidated. It is expected that by the end of summer, if the rock continues to yield as at present, the company will be entirely free from debt. The ore body continues small, but improves in quality. The last run was the best yet made.

Miscellaneous.—The clean-up at the Downs' mine, made a few days ago, panned out $25 per ton. While this is a splendid yield, still it is less than the average rock taken from this mine. The decreased yield is accounted for by the fact that the ore of late has come from stopes near the surface, and it has been the experience in connection with the claim, that the ore has improved in quality with increasing depth. The Talisman mine and mill are both idle. Beyond the taking out of water, there is nothing going on around the works. Parties are negotiating for the purchase of a controlling interest in the Eclipse mine, at Amador City. If the sale is consummated, and there is every reason to believe that it will be, active operations will commence almost immediately. Both the Gover and Bunker Hill mines are passing through a period of depression. The yield lately has been barely sufficient to pay expenses. At the Pennsylvania mine, New Chicago, the indications point to a protracted period of idleness. The wood and other material about the works have been sold. They are negotiating with J. R. Johns for the sale of the hoisting and other machinery, and it is understood that if a sale cannot be effected, most of the works will be sent away to Fresno county. Twelve men are employed on the Maryland and Seaton mines. Charley Peters, on Thursday, shipped a couple of tons of quartz from the Goop Hope mine, in Jackson, to Sacramento, to be treated by the Roberts process.

CALAVERAS.

West Point.—*Citizen*, June 7: In and around West Point, summer is on hand, the mercury rising to 00° and over. Haying is just beginning, with prospects for a fair and over an average yield, and in consequence there will not be much mining for the next few weeks. The quartz mills, however, are all busy and will continue working until water gives out in the fall.

EL DORADO.

The Black Rock Mine.—*Democrat*, June 7: Superintendent John Sipp informs us that a crushing of rock recently made turned out splendidly. The mine is now equipped with a five-stamp mill, which takes the place of the French burr-stones originally tried, and work will be pushed right along. Both ledges are developing first-rate.

E. D. W. & D. G. M. Co.—This company is now working the White Rock, Reservoir Hill, Loomis and North Excelsior mines, besides furnishing water to wash tailings in Spanish ravine and in the creek on the Bush Dickson ranch. They expect soon to have employment for all the water they can bring down.

Robertson Process.—A lot of 10 tons from the Gold Deposit mine, near Kelsey, is to be tested, of which a portion has already been shipped. Also 10 tons from the Rose mine, this city, for which Mr. Parkinson gave Mr. Brewster $15 per ton at the mine, that being the full amount which Mr. Brewster claimed that he could net by milling it, and Mr. Parkinson sends it below at his own risk and as a speculation from which he is sanguine of realizing a handsome profit. An arrangement is reported, by the terms of which he engages to take the entire product of the Rose mine at the above figure.

MONO.

Placer Gold.—*News*, June 5: Our reporter was this morning shown a beautiful little bar of placer gold, taken out of one of the claims immediately above the schoolhouse. Its weight was 15 ounces and its value about $14 per ounce, or $210. This was the result of about 15 days' work on the part of two men. Nearly half the time they were without water. Were it not for this drawback, a good deal of money would be taken out of the placers. The same parties a few days ago had a bar of $60.40.

The Dudley Mine.—Connection has been made between the 300 level and the old tunnel workings by means of the upraise, and drifts north and south are being run in the ore body, preparatory to stoping. The drift is now about 60 ft in length. The richer ore, which has many of the characteristics of that of the Bodie in color as well as in other respects, is being carefully sacked. The pump will soon be here, when sinking the main shaft will be resumed.

Pontiac and South Bonanza.—The Pontiac and South Bonanza ledges were located south from the Richer mine, by some Italian boys, a short time ago, and has been quietly and persistently worked on since its discovery. Yesterday, Al Morgan and Charles A. Looso, who have been working the case up, completed a bond on both mines, with the privilege of commencing work upon the property at once. The developments made thus far, have been made by means of a shaft down 30 ft, and a tunnel run in on the slope of the mountain to connect with the shaft. We were shown an average of assays of rock, taken from different portions of the mine, which shows a result of $77 per ton in gold and silver, mostly silver. Work will be at once commenced on this valuable property, and as it has, thus far, produced paying ore from a vein averaging three and one-half ft in width, which continues from the grass roots, we consider it a good milling proposition from the start. The discovery of the ledge will go far toward reviving confidence in the value of south-end properties, and make assured the theory that the ore channel extending through Bodie bluff, Silver hill and Queen Bee hill, is continuous and unbroken. We regard the work to be done upon this mine as being of the utmost importance in adding strength to the kindly feeling already existing toward the south end, and look for most cheering reports from that locality. The rich ore found in the two mines named will cause prospectors to thoroughly examine contiguous ground, and the result will be discoveries of more and valuable ledges still further south. We are of opinion that the mineral belt extends through the whole country from Aurora to Lake district, and that, ere another year has passed, Mono county will have assumed a rank second to no other mining country in the world. We have the mines and will soon have men with capital willing to invest, who will soon make the southern end of the lode as notorious as the famous Standard and Bodie now are.

Bullion Shipments.—*Standard*, June 5: From the 1st to the 5th of June the Standard Con. has shipped two bars of bullion, through Wells, Fargo & Co., as follows: No. 132, $21,102 34; No. 133, $20,761.57; total, $41,053.91. Bar No. 133 closes the shipment of the Standard Con., on account of the fiscal month of May, with a total of $114,951.81. We yesterday mentioned the shipment of Noonday bar No. 3, amounting to $4,070.50. The total shipments from the 1st to the 5th of June would, then, be as follows: Standard, $41,053 91; Noonday, $4,070.59; total, $40,033.50. Before the close of the present month, we expect to see the ranks of the bullion-shipping mines receive a lively recruit, in a no less important mine than the Bodie.

Red Cloud.—Running a crosscut east on the 400 level to cut the Westchester ledge. Have made 30 ft within the week passed, and the character of rock has a favorable look. A contract has been let beginning at the extreme south end of the south drift of the 250 level in the Red Cloud. Everything about the mine and works in magnificent condition.

PLACER.

Items.—*Herald*, June 7: We learn that gravel that pays $25 per day to the man has been struck in a mine located in El Dorado canyon, a little above Sunny South, in which our friends Ed. Polifka and E. L. Dooley are interested. Who the other owners are we have not heard, though, doubtless, they are parties mostly residing in that locality. Pending particulars, we say, bully for the boys. We were shown a prospect yesterday, from one pan of dirt taken from Stuart & Low's mine, located a mile or two below Auburn, which was very flattering, indeed, there being in the pan not less than $3 or $4. Mr. J. R. Nickerson brought into our office on last Wednesday a large specimen of copper ore which he had taken from his claim, which is located on Bear river, near the mouth of Wolf creek, Nevada county. This specimen was taken from four ft beneath the surface, and is said to contain from 60% to 80% of pure copper, and is a fair specimen of the entire ledge, which is 34 ft wide. Mr. Nickerson has been laboring under adverse circumstances in the opening of his mine, but the dark shadows that have hitherto clouded his future are giving way, and a brighter prospect presents itself. He feels fully confident with his mine thoroughly developed his most sanguine anticipations will be realized.

American River Mining.—Mr. Chapman, superintendent of the American River Dredging and Mining Co., is making active preparations for commencing the season's operations. Last summer was spent mostly in building the boat and getting the machinery in place. Some work was done before the rains swelled the river, though not enough, hardly, to fairly test the richness of the ground. The machinery and dredger, we understand, worked most admirably, and the gravel taken up from the river bed, toward the last, paid unusually well. The very last run made last fall, some $50 was realized in a few minutes. With these encouraging signs, the company enter on their work this season with naturally bright anticipations.

Dutch Flat Items.—*Forum*, June 5: Last week the Southern Cross cleaned up between $5,000 and $6,000. Paid off last Monday. The claim has enough ground broken up to make another run, which, it is expected, will pay better than ever. The Polar Star has commenced to clean up. The Franklin mine, under the superintendence of E. Miner, is pushing forward the work of a new drift, and will burn 500 pounds of powder as soon as it is completed. The mines at Oold Run are all running on full time and with good prospect. The Big Bonanza, owned by the Towle Bros., J. L. Gould and Col. J. F. Moody, work 25 to 30 men night and day, and are using about 1,500 inches of water. The Cedar claim is also running on full time—about 15 men are employed night and day. The mine prospects well and good results are anticipated. Work on the El Capitan mine has been progressing favorably. The incline is down 42 ft, and water struck which will delay further sinking until machinery can be erected. In the meantime the workingmen will be kept busy taking out ore. Talbot's blue gravel claim at the head of Oold Flat is looking well. The channel has been prospected for a distance of 200 ft on the line, and is opened up for about 600 ft. The Badger Hill company, near Cherokee, cleaned up a few days since, and the result was very satisfactory. The Eureka Lake Con. mine, at Columbia Hill, made a good clean-up last week. The tunnel of the Planet gravel mine is now in a distance of 1770 ft. Of late the ground has been harder and progress slower, but the location of the gravel channel is known, and it will be reached before many weeks. Thomas Ewving has been appointed superintendent of the Murchie quartz mine, vice M. Oarver, resigned. The Pittsburg is doing finely under Captain White's superintendence. The ore bodies are enlarging in most directions. There is also a decided improvement taking place in the grade of the ore. In the Idaho mine, during the past month the drift in No. 11 level, 180 ft below the 10th level, has been extended 15 ft, making the distance opened on the level 35 ft. The ledge is strong four ft, and the character of the rock continues to improve as the drift goes eastward. The distance yet to run to get the regular pay chute that goes down from the 10th level is estimated at from 50 to 60 ft. When this point is reached the usual high-grade rock of the wonderful pay chute, for which the Idaho has been so long famous, will be entered upon. On the 10th level the drift is in 480 ft east of the new incline, carrying a four-ft vein of good pay ore. On the 9th level, some distance east of the new incline, the vein has been cut out by a horse, but it is expected that the ledge will come in again any day, as on the 8th level the ledge holds regularly at a point further east than the 0th level has been driven. The air shaft that is being sunk and raised in the eastern part of the mine, lacks but 202 ft of a through connection down to the 10th level. The Oodfrey mine produced a beautiful bar of gold worth $1,150 from last week's run. Scadden Flat now has 50 men on its pay roll, and besides there are 10 tributers at work. A clean-up on Monday of a nine days' run of the mill yielded $2,300, besides one ton of sulphurets, which assay $00 per ton. Rocky Bar is working 30 men. The drift has been opened about 100 ft from the bottom of the perpendicular shaft, where the ledge is from 12 to 15 inches in width. The ledge is producing profitable milling ore, the last crushing of 00 loads, which was cleaned up yesterday, gave $38 per load. The main incline of New York Hill has reached a depth of 1,000 ft, carrying a small ledge, which is generally of a high grade of richness. This pay chute is not wide, but it produces enough to carry all the expenses of the mine, and give an occasional dividend.

TRINITY.

Cinnabar District.—*Journal*, June 7: The Altoona company last month produced 520 flasks of quicksilver, but owing to their having run short of pan-iron, the production this month will be small. The iron is now in Reading, and will be at the mine some time next week, when the retorts will again be run to their full capacity.

NEVADA.

WASHOE DISTRICT.

Union Con.—Gold Hill *News*, June 11: The point of interest in the Union now is the south drift on the 2300 level (2200 level of the Sierra Nevada), which has been turned to the west and is being carried toward the North Con. Virginia (now Union) shaft. A careful calculation makes the distance for this cross drift to run to reach the desired point 35 ft. It is also estimated that the distance to the east edge of the ore vein is from 40 to 45 ft, so that, if the ledge holds its course, and the formation is remarkably regular, no ore can be expected to be encountered in this cross drift. From it an upraise to meet the shaft is to be made. During the latter part of this week a chamber is to be excavated on the 2000 level, joint with Mexican, for a winze down to the 2300 level. The north and east drifts on the 2000 level are also to be cleaned out and the latter will be pushed on toward the Union shaft. The north drift on this level is now 415 ft from the south line, the face still in hard, blasting porphyry carrying some water.

Alta.—The east crosscut on the 1350 level is making good progress in favorable-looking quartz. It is just getting into the ledge proper and showing some spots of ore. The north drift, 1450 level, is still cutting half its width into the hanging wall, and still encountering porphyry on one side and quartz on the other. It is being run parallel with the ledge. The north drift on the 1550 level is within a very few ft of the Lady Washington line, and is partly in clay. The ledge seems turning across the face of the drift, and it is showing more quartz while still cutting a mixture of quartz, clay and porphyry. On the 1750 level the north and south drifts are being extended, and are in respectively 85 and 75 ft. The starting point of these drifts was carried east by the station on the 1750 level, and the drifts are now being turned west toward the ledge. When the clay is encountered they will follow it for bases for crosscuts.

Ophir.—The incline has reached a point 85 ft below the 2300 station, the bottom in a soft, kindly-looking vein formation. Chutes are now being excavated for the station, which work interferes with the sinking. The east drift, 2300 level, is in 95 ft, in a vein formation showing some quartz. South drift, 2100 level, is passing through low-grade ore, its face 150 ft from the bottom of the winze. The north drift from the same point is now in 100 ft in fine vein material. The usual repairs are going on. The ore stopes show no change. The clean-up for May was shipped last evening and amounted to $32,755.90; total for the month, $101,882.97.

Con. Virginia.—Usual progress is being made in the joint California west drift, 850 level, the face in hard, blasting porphyry, 272 ft from its starting point. On the 1500 level the south drift west of the stopes is 90 ft in a favorable-looking vein formation, carrying streaks of quartz. The main lateral drift to the Oould & Curry shaft has been enlarged and retimbered. The joint crosscut 1850 level, is in a favorable vein formation. The south, drift, 2150 level, is still passing through streaks of quartz and clay; total length, 147 ft.

California.—The joint workings with Con. Virginia on the 850 and 1850 levels are making usual progress, and are without particular changes of formation. Work in the bottom of the C & C shaft has been resumed. The flow of water is still heavy. The connection with the Ophir, 1750 level, is also receiving attention. The clean-up of bullion for the month of May will be shipped to-night. The total will not be far from $230,000.

Oould & Curry.—Saturday work in the face of the east joint crosscut, 1700 level, will be resumed.

Mexican.—The connection between the joint Union winze from the 1600 level and the upraise from the 2000 level to meet it, has greatly improved ventilation on both levels. Some time this week yet a chamber will be excavated on the Union line, from which to carry a large winze down to the 2300 level. A joint Ophir winze is to be soon started from the 2100 level to be carried down to the 2300 level.

Savage.—Retimbering the incline is completed. Putting in the drain to the Sutro tunnel connection. The pumps and pump column of the perpendicular shaft and the incline above the 1640 level will all be raised to the surface this week.

Justice.—On the 1500 level the main drift south and the west crosscut are both in a strong formation of mineralized vein material.

Sierra Nevada.—The incline is making slow progress below the 2400 level, and some 10 or 12 ft still remain to complete the sump. The flow of water continues at about 145,000 gallons per day. This, however, is readily handled. The breasts continue to look and yield well.

Julia Con.—Repairs to the south drift, 2000 level, have passed the hottest point and are making better progress. New pipes for compressed air are being placed in the shaft.

Con. Imperial.—The north drift, 2000 level, is now in 310 ft, and without change of material. The south drift, same level, toward Crown Point, is making good progress. The winze joint with Alpha is now 320 ft below the 2400 level, its bottom in quartz and porphyry.

Utah.—Repairs to shaft are about completed.

Bullion.—The winze engine is up and running, and sinking in the winze from the 2150 level is going on again. It is being sunk the whole size of the incline to give a chance for air and work. The engine has two reels and is counterbalanced. The winze will be pushed with vigor to the 2400 level of the Con. Imperial.

Yellow Jacket.—The shaft has now reached the 2000 level. Good progress is being made in connecting the shaft on the 2500 level with the old workings east from the bottom of the north winze. There now remain less than 200 ft to run.

Silver Hill.—Taking out a few tons of low-grade ore daily from the surface workings.

Belcher.—Oood progress is being made sinking the main incline, and it is now 53 ft below the 2700 level. On the 2560 level the south crosscut is in 80 feet, and advancing at a very good rate, with its face in promising quartz and porphyry.

Sierra Nevada-Mexican-Union Con. Shaft.—Sinking below the 1800 level is going steadily on as the shaft is being prepared for future efficient use. It will take some 10 days yet to get the bins and chutes all ready for the use of the skips.

Crown Point.—The station, 2700 level, has been completed and connection is now to be made with the Belcher on 2700 level—a corresponding level. The north drift, 2500 level, is in soft porphyry and being continued along the ledge.

Exchequer.—The north drift, 2400 level, is making the usual progress; total length, 427 ft.

Best & Belcher.—Work in the joint east crosscut, 1700 level, will be resumed Saturday. The Osbiston shaft is 10 ft below the 000 level. The flow of water is very heavy, keeping the pumps and bailing tank running.

Chollar-Norcross-Savage Shaft.—Waiting the completion of the Sutro tunnel sub-drain. Ready for work.

PARADISE DISTRICT.

Bullion.—*Silver State*, June 7: E. P. Torrey brought down from Paradise yesterday, bullion valued at $1,500. It was the product of ore from the Bullion mine, worked at the Sedan mill. "Eb" says he will bet on turning out $1,000 in bullion daily from Big Prize ore during the month of July, with his five-stamp mill, and he always bets to win.

The New Paradise Mines.—Charles Siskron informs us that the mines recently discovered on the west side of Paradise valley are creating considerable excitement. These mines are situated about 10 miles west of Spring City. One of the claims, called the Solid Silver, bids fair to be all that its name indicates. At a depth of 25 ft from the surface, the greatest depth attained on the ledge, the ore is surprisingly rich in native silver, and the lead is large and well defined. Other rich ledges have also been discovered near the Solid Silver, and the prospects for a rich mining camp are very encouraging. We saw some rich specimens of fine milling ore taken from the Scott, Ellivreet and other mines in Silver State district. The ore is the best we have seen from any outside district for some time. The owners of the mines say that they have a ledge of 10 feet in width of the same class of ore, and have great faith in their property as well as in the district, which is situated about 40 miles from Paradise district, on the same range of mountains. The gentlemen who showed us the ore think that when the mines

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The Telluride Ores of Gold.

[Thesis by RUSSELL L. DUNN, College of Mines, University of California.]

It is only within the last decade that the telluride ores of gold have become of metallurgical importance. Before this period tbey were rare mineralogical curiosities only found in very small quantities, and in two or tbree widely separated localities. Transylvania was the principal source, though on the Siberian flank of the Altai mountains and in the States of Virginia, Nortb Carolina and Georgia some species were found. Their discovery first in California and later tbe more important one in Colorado, bas given them a new importance, and has directed the attention of tbe metallurgist to them.

So recently bave they become of economic importance, and so difficult are they of reduction, tbat tbeir beneficiation can scarcely be said to have passed the experimental stage. For these reasons, and because of their occurring in only a few localities where they can be worked as an ore, there is very little published about them. Again, all this is scattered throughout the whole range of mining literature, principally periodical, of the last six or eight years. In regard to tbe geological occurrence and mineralogy of these ores more complete investigation has been made, but the results are not perfectly satisfactory and are often contradictory.

In discussing these ores the first point to be considered is their

Geological Occurrence and Distribution.

In California the only localities where they are found thus far in workable quantities are in Tuolumne and Calaveras counties. In both in the great jura-trias slate belt on the motber lode or its feeders. *In Tuolumne county the predominating formations are argillaceous and silicious rather than talcose. Serpentine is one form of the metamorphism and is found in large masses. Besides the slates there are sandstones belonging to the same series in various stages of alteration, in some places so much so as to resemble true eruptive rocke, porphyritic and trappean. Highly altered limestonee are also found in this series. In Calaverae county the general geological characteristics of the slate belt are about the same as in Tuolumne, except that a talcose formation occurs more frequently. Also it carries a greater variety of valuable minerals and ores. The belt runs tbrough the west central portion of botb counties, and is bounded on the east side by granite which forms the principal mass of the Sierras.

The great motber lode of California with its feedere and parallel ledges crossed these two counties in the slate belt. On this lode and on parallel ledges at several points telluride ores have been found. Their range is, however, rather restricted; in Tuolumne county, in the Green, Raw Hide and Golden Rule mines, near the northern boundary, and in Calaveras in several miues about Carson Hill, near Robinson's ferry, in the southern part of the county. These localities mentioned aro not more than 20 miles apart. All of the mines were opened as free-gold miues, and as such have furnished, more particularly those about Carson Hill, some remarkably fine specimens of native gold *in situ*. It was not until they had been worked to some depth that telluride minerals were found.

The predominating rock of tbe region in Kern county where these ores are reported to have been found recently is granite, though small quantities of highly metamorpbic slates and sandstones are found in patches. Discoveries are reported by tbe local papers in San Luis Obispo county, but partieulars are not given.

In Colorado tbese ores are found in what is called the telluride belt. It is situated in the northern part of the State, and lies principally in Boulder county. It is about 20 miles long by from 3 to 4 wide, and extends from a point 20 miles soutbeast of Long's peak southwest into tbe northern part of Gilpin county. This region does not comprise all the localities in Colorado where telluride minerals are found, but is by far the most important, and the others may therefore be disposed of without detailed discussion. They all have some similar features, and align with eacb other almost across the entire width of the State. A peculiar blue granite characteristic of the Boulder county telluret region has been generally observed in all of tbese places.

The telluride region of Boulder county† is in the mountains on their eastern elope at an elevation of about 8,000 feet above tbe eea level. "The rocks of the mountains as a whole may be considered as composed of a great series of metamorphic rocks of pre-eilurian or archæan age. Quartzites, silicioue, micaceoue, eome bornblendic and garnetiferous schists, gneisees and granites all occur; the gneiss, with possibly granite predominating. The granite, though presenting the appearauce of eruptive granite, was probably formed *in situ*. The metamorpbism is extreme and was probably accompanied by a great eoftening of the rock, thus permitting of molecular rearrangement, so that it has now no trace of eedimeutary origin. The eame granite mass approached from opposite sides might convey entirely different impressions as to its origin; on one side metamorphic and indigenous; on the other, eruptive or exotic. The echists and granites are pieroed at many points by dikes of felsite porphyry, often differing in character in the different dikes. Besides theee dikes, the porphyry seems to have been forced out from the interior and forms rounded hills. The age of the porphyry is yet undetermined, but it is probably more recent than that of the triassic strata whicb flank the base of the mountains."

A careful study of the mineral veins* lying in tbis belt shows the existence of at least three sets of different ages:

1. Silver bearing; very prominent in tbe district immediately nortb of the town of Caribou.
2. Free gold bearing veiue or veins carrying no tellurides.
3. Veins carrying free gold and telluretted minerals.

The veins of tbese different sete cross each other at every conceivable angle, and in some places they are so numerous as to completely cut up the country rock. All of the veins carrying tellurides, seem, from their mineralogical constitution and other considerations, to be undoubtedly of the same age, and the peculiar situation of a few of them may throw some light on and possibly fix their geological age.

The cross-section of tbe Red Cloud and Cold Spring veins will illustrate this peculiarity of situation. The veine are contact veins, between a porphyry dike and gneissic granite; the dike forming the footwall of one vein, and the hanging wall of the other. †On the eide of the dike, the walls are clearly defined, but are indefinite and blend with tbe granitic materials on the eides adjacent to the country rock.

It eeeme probable from several indications that the intrusion of tbe porphyritio dike occurred subsequent to the filling of the vein and deposition of the telluride minerals and gold. The veins on each side of the dike eimilar in all essential points as regards mineralization, is unique and hardly possible on any other supposition tban tbat they were deposited at the same time. Did the dike come in first, it would be essential almost that they sbould be deposited at different periods. The vein matter is considerably altered immediately adjacent to the dike; the quartz is darkened and hardened, becoming cbalcedonic or hornstone. But a comparatively emall quantity of mineral is found in this portion of the vein, pyrite in small brilliant highly modified crystals being the principal one. The telluride minerals show a strong tendency to cling to the country-rock wall, and even find lodgment in tbe granite outside. No vein minerals except pyrite are found in tbe body of the dike. An examination of the ore with the microscope sbows the existence of minute shot of gold and even eilver (?), sometimee the former is found in nuggets of considerable sizes not yet wbolly reduced from its combination with tellurium. All of the above go to show the existence of a long-continued higb heat from tbe dike eide of the vein. This heat could not, however, have been sufficient to fuse gold, and was probably lower than the melting temperature of lead. The metallic gold could have been reduced to the form in which it is found in the veins, from its telluride combinations at the latter temperature.

A consideration of these facts shows that the two present veine were probably deposited as oue, at a period preceding tbe eruption of tbe porphyry. Other contact veins between porpbyry aud other rocks sbow eimilar features.

European Telluride Depoeits.

Iu Transylvania the tellurium deposits are accompanied hy igneous rocks of a more recent period than tbe eocene sandstones of that locality. In Offenbanya they occur under very peculiar circumstances. They are found in veins in igneous rocks, and in segregated masses in granular limestone. Van Cotta, in his treaties on Ore Deposits, page 277, abstract, says: "Tbe gold lodes appear dependent on trachytio or feldspathic, quartzose igeneous rocks (timazite, *i. e.*, propolyte), or to have been caused by their breaking out. The veins traverse, however, clay-slatee and eocene sandstones, in the neighborhood; from whicb circumstances, as well as from tbe tertiary age of tbe tracbytic rocks, it is very evident tbat they are more recent than tbe eocene."

No propolyte has been found in tbe Colorado telluride region [Marvin], nor so far as I am aware in the California localities.

Vein Formation, Etc.

In California the eame lode, or system of lodes, carries tellurides at one point, while not a trace of tbeir presence can be found at othere. They eeem here to come in chimueye or ore cbutes. Tbe wall rocks and ganguee are similar to those of other gold-bearing veine in tbe eame locality. The formation consiste of argillaceous, talcose and chloritic elates; the gangue of a pure white quartz. In Colorado we do not find such a coincidence in general features between tbe two correeponding classee of veine, nor do the telluride mineral veine of that State resemble those of California. The gangue is not a pure quartz, but is a harder and tougher rock, and fewer epecies and a less quantity of the common associated minerals are found than iu the other claes of gold-bearing veine of the same district. The thickness of the veins variee from a few iuches to six or eight feet, but the ricb tellurium ores occur in comparatively narrow eeams. Theee seams are not equally ricb throughout their whole extent, in some places completely pinching out, in othere forming extraordinary rich pockets and chimneys. Besides these rich seams the mineral is more or lese disseminated through the entire body of the vein, so that the only trace of its presence is a dark stain in the quartz.

Peculiaritiee in the condition of tbe mineral in different veins are often noticed, but have been little etudied. In some cases high crystallization predominates, in otbers is almost wholly absent. A peculiarity has been observed comparable to the "rusty" condition of gold. The general character of the ores, as we go down on the veins, does not materially differ from that mined above, except that tbere is a greater proportion of free gold near the surface and more pyrites frnrther down.

Concluelons.

A consideration of tbe preceding shows no peculiar geological relations, differing from those connected with tbe ordinary gold quartz formations, to guide in the searcb for uew telluride districts. As a matter of fact the chances are decidedly against findiug new districts by searching for them. In the first place the ores are rare. Again tbe veins in whicb they occur bave no distinctive outcrop or float, by which tbe prospector can identify them.

Tbe most extreme results of metamorphic action are observable wherever these minerals are found in sufficient quantity to constitute an ore. The deposits in Colorado would seem to be the oldest. They are found in the oldest known series of rocks, the archæan, and could hardly have been formed subsequent to the triassic. In California the formation is jurassic, or, as it is better considered, jura-trias, and the veins cretaceous [Clarence King].

It may be observed that tbe tellurium-bearing veins, though they are distinctive of the district in which they occur, do not predominate; invariably they are accompanied by otber metalliferoue veins or deposits in which no trace of tellurium can be found. Free-gold veins alwaye accompany them, also, as in Colorado and Siberia, silver-bearing ledges may.

It is probable that workable deposits of telluret minerals will yet be found in Colorado on tbe western elope of the Rocky mountains between the South Park and the New Mexico line, in tbe southeastern part of Utah among the epurs of the Wasatch mountains, and in California in tbe northeastern part of Kern county.

[To be Continued.]

*To avoid repetition of references, I will stats here that the facts for this geological discussion are principally taken from the "Mining Notes and Staff Correspondence" of the *Engineering and Mining Journal*, Vols. 23 and 24; "United States Geological Survey of Colorado," 1873, pp. 685, 690; Bowman in "Raymond's Report," 1875; and "Geological Survey of California."

†Silliman in "United States Gsological Survey of Colorado," 1873, p. 683; also Marvin, p. 685.

‡Geological Survey of California. Tuolumns and Calaveras counties.

† Marvin, in U. S. Geo. Survsy of tbs Rocky Mountains, 1878, p. 685.

EASTERN INVESTORS.—Speaking of the interest taken in mining matters in the East, the New York *Stockholder* says: Until lately gold and silver mining has been left to the adventurers who thronged first to the Pacific States, and later to newer regions of Colorado, Utah, Wyoming, etc. The money of Eastern capitaliets formerly was adequately employed in railroad building, invested in bonds of railwaye, Government bonds and other securities, which, for the time, yielded satisfactory returns. Of late yeare, so many railroads have failed to pay interest on their bouds, tbat investment in them bas been discouraged. Government bonde no longer pay more than four per cent. per annum. This low rate of interest has led many of our eolid and judicious capitalists to give attention to mining enterprises as a source of large revenue. Within this year, particularly, great numbers of investors of tho richer eort have purchased iuterests in mines. We hear daily of our leading capitalists buying shares in new mines. Millions of dollars are going into that cbannel of investment, as is illustrated in the case of the Horn Silver mine, in Utah.

THE SOUTH AFRICAN CABLE.—The telegraphic cable to connect the European and Asiatic telegraphic eystems witb Cape of Good Hope will be 4,000 miles long, extending from the Red Sea cable, at Aden, around Cape Guardafui and along tbe east coast of Africa to Port Natal, where it will make a junction with the present land line to Cape Town. The cable will be laid along the coast, the depth being moderate along that side of the continent, and tbe facility for repairing possible breakages has been carefully ascertained. The cable will touch at Zanzibar, Mozambique, Sofala, Delagoa Bay, and thence to Durban as the submariue terminus, from wbich point tbe land telegraph becomes available to complete the circuit to Cape Town. The coet of constructing and laying the cable is estimated at $7,500,000. The line from Durban to Zanzihar ie to be finisbed in July, and the wbole cable by the middle of November.

AN AEROLITE.—The Eureka *Leader* says that Mr. James Marsh, of Huntington valley, brought from that eection a epecimen of a meteor which fell to the earth recently. He etated tbat the falling, wbicb took place early in the evening, was accompanied by a sound as loud as tbe report of a cannon. Parties on the ranch, in company witb Mr. Marsh, searched for, found and dug it out, the piece weighing in the neighborhood of 400 pounds. It is a hard, dark-colored substance, and wben scraped with a knife reveals a bright lead-colored interior, but much harder than lead. The eurface is indented witb concrete rings, evidently graven by its rapid whirling motion.

LOOKING UP.—The prospeots of Bristol, a mining town in eastern Nevada, appear to be brightening—a faro game has recently been opened there.

Leadville as It Is.

The acme of business prosperity in Leadville was reached about six weeks ago. Then merchants had all they could do, restaurants were crowded, hotels overflowed, every chair in the saloons pre-empted, tbeaters attended by drowsy eleepers, because beds were not to be had for coin, lumber fresb from the log $55 per thousand, freight from Webster (the end of the Denver and South Park railroad track) five cents per pound, tbe stages arrived full of passengers every night and the army of weary pilgrims a-foot came like a cloud of locusts from the East; real estate way up—naked lots on the prinoipal business streets selling for $10,000 each. All this was six weeks ago. There has come a change. Merchants are skirmishing for business and many declare they are not paying expenees; restaurants are going behind. One of the principal restaurant proprietors told me bis receipts had falleu from $400 to $75 per day; his rent is $300 per month and he must inevitably close his business. The hotels now have ample room for all their guests; tbe saloons are not overrun with custom; the theaters are not patronized as they were; lumber has dropped from $55 to $17 per tbousand, and freight from the end of the track has fallen to two cents per pound. The coming crowd hae lessened, while the departuree bave increased. Fifty-five dollars per tbousand for lumber induced the erection of 40 saw-mills; bigh prices for goods brought in bundrede of merchants; while five cents per pound for freigbt mentioned in Kansas and Missouri was of itself sufficient to send every available quadruped in tbose States to the front to haul for Leadville. So everything has been overdone. Real estate now has no fixed price, and lucky is the poor fellow who can get 30% of what he considered his property was worth two months ago. The whole trouble is, that 20,000 people have gone in to do a business that cannot legitimately afford a eupport for over 4,000 souls at the outside. The sanitary condition of Leadville is not what its admirers could wish, nor do the local press give tbe truth in this respect. Pneumonia is the most prevalent and fatal disease, and the death rate ie from five to eight daily—or, say, 42 per week, just one-half that of San Francisco, with its population of 300,000 souls. The cemetery of Leadville, in use but little over a year, speaks in tones more melancholy than words.—*Cor. Salt Lake Tribune.*

The San Pedro.

The valley of the little river which is named the San Pedro, presents the possibilities for a very iufluential positiou in the future of Arizona. Territory. It is expected, of course, that the mining interests of this country will be foremost. The peoplo of capital, and tbeir myriad employees, will pay attention to that alone; and whoever allows himself to stop and plod away on a ranch, may in time come to be looked upon as a curious specimen of man among those who only think of "lodes," and "walle" aud "pay streaks," etc. But there will be a few who will still think it wortb while to depend upon Mother Earth. Properly managed, the San Pedro valley will furnish homes to many a thrifty family. The Soutbern Pacific railroad will cross it from east to west, and it is obvious that there must be a thriving town close by, wbence will be taken supplies for Tombstone and other mining districts which may rise into successful life in the near future. The Whetstones, the Dragoons, where some good prospects are reported, the eastern spurs of the Catarinas, and all the regions to the southward would be tributary to a town located in or near the San Pedro. The valley is broad and rich; its length is fully a hundred and fifty miles; and the stream has a peculiarity unusual in tbat locality—it never runs dry. From tbe mesa bench on each side, to the valley proper below, there is a sharp descent, tbe banke baving, on a small scale, the canyoned appearance of tbe Colorado and otber remarkable streams. There are numerous points where the valley is actually walled, and where tbe floode of the rainy season migbt easily be stored for use in the event of scarcity, in which respect it has greatly the advantage of the Santa Cruz, Salt River and Gila. Probably the San Pedro would have been far in advance of wbere it is to-day, but for two things: Tucson has always had the advantage of being nearer, and of more easy accese to Sonora; and the San Pedro has been the very etronghold of that etrange and violent eystem of belief known in modern parlance, as Apacheism.—*Arizona Citizen.*

A CURIOUS CAVE.—Some time eince N. Bell, of Pinos Altoe, while out hunting near tbe Mogollon mountaine, came upon a large cave which, upon examination, was found to contain carved etone images, and various other articles of human workmanship. The cave is of natural formation, being about 100 feet in length by 20 feet wide and 7 feet high. Tbe walls are elaborately ornamented with grotesque figuree, wrought in colors the brilliancy of whicb is still well preserved. Mr. Bell had no time to make a thorough examination, but eatisbied himself with bringing away such of the imagee, etc., as he could conveniently carry, purposing to return at an early day and complete hie examination. One of the images, measured about two feet in length and weigbed nearly 40 pounds.

More Mills Wanted.

One had rather see too few mills in a district than too many, as nothing looks worse in a camp than idle quartz mills. But it is obvious that Bodie is now in downright need of greater milling facilities. It will probably be a somewhat suprising statement to strangers that with their record as a bullion-producing camp, they have never had more than 54 stamps in the district—20 at the Standard, 20 at the Syndicate, 10 at the Bodie, and 4 at the Miners. Heretofore the three last named have been run as custom mills, the Bodie mill at present running on Bulwer ore, and the Syndicate working for various companies. The Miners mill has an engagement for an indefinite period on Noonday ore.

Recent developments, however, and the gradual growth of the district, have created a great change in the milling requirements. The new discovery in the Bodie mine creates an imperious demand for the use of a mill by that company. If they take their own mill the Bulwer people will be compelled to move out. The Syndicate company are but awaiting the connection on the Osceola vein, between the upper and lower tunnels, to commence crushing their own ore, of which there is a sufficient quantity to keep the mill running for years to come. While the ore is not high grade, there is considerable more money in it for the company than to run on custom rock.

Then comes along the Tioga. This mine could now keep a 20-stamp mill running for a long time upon ore from its 320 level; and if the vein is found to hold its own at the 520 level, at which depth a crosscut is now being run to intersect it, the Tioga really will need a mill of its own. The Bechtel, Blackhawk, Summit, Belvidere, Con. Pacific and South Bulwer all have considerable good milling ore on hand, and while they may not need mills of their own, they would certainly be good customers. The Noonday will probably continue crushing at the Minere until they put up a mill of larger capacity on their own account.

As it stands now some one is bound to be crowded out, and that before many weeks. If the Bulwer continues crushing at the Bodie mill, and the Bodie people have the Syndicate—and they must have that mill or their own—there will be no facilities for the other mines mentioned to crush ore. The fact is that the Bulwer and Noonday, and probably the Tioga, need mills of their own, and a good 20-stamp custom mill outside of these would find constant employment. In short, the milling capacity should at least be doubled within the next 90 days.—*Bodie Standard.*

Working Beds of Mountain Streams.—Mr. J. C. Kernan, in *American Exchange:* I have for a long time been studying the best method to work the beds of mountain streams. The old system of damming the rivers is very little practiced now, experience having taught the miner that the time to work was so short and the labor and expense so great, that it would not warrant them in continuing the method then practiced. That there are millions of wealth in the beds of mountain streams in the vicinity of the rich mining districts of California, all who have had any mining experience will concede. How to get at that wealth and to open up a new field of industry where the many willing hands might find remunerative employment, has been my incentive to continue that study until I had accomplished my object. I now feel confident that I have succeeded in my undertaking. I propose to work the bed of the stream from the surface or above the water; to build a raft of the required dimensions, and then place it in any position desired. Raise the debris to the surface by means of implements constructed for that purpose, empty it into a receiver, where the gold is separated, and the residue emptied into the water again. No labor will be required except to turn the crank which raises the material from the bottom.

Signal, Mohave County.—Deserted village. Each Arab has folded his tent and gone. Of the busy town of 1,000 people, plenty of McCrackin script and more expectations, perhaps 25 are left, until hardly a sound is heard. All due to the splendid management, or no management, of the Signal and McCrackin mines. So much for the management of men who sit in palace offices, luxuriantly furnished with other people's money, who think they know how to manage a valuable mining property, but have always failed. Everybody here, those who know, and those who ought to know, believe that both these mines are as good to-day as they were years ago, and the ore just as rich at least. The appearance of the mines and the assays of the ores prove both these assertions to be correct.—*Cor. Enterprise.*

Honors to a California Tree.—We learn by the proceedings of the Highland Agricultural Society, of Scotland, that our native tree, the silver fir *(Picea nobilis)*, is in high feather for planting in Scotland, where it was first introduced from northern California in 1831. A specimen in Argyleshire, blown down in 1874, was nearly 60 feet high, and girthed 6 feet 6 inches at the butt, and 3 feet 8 inches 20 feet from the ground. Aside from its great beauty for shade and ornament, it is recommended to be planted as a common forest tree.

Useful Information.

Grindstones.

What can disable a machine-shop more effectually than to destroy the *grindstone!* Unless the loss were supplied by the modern substitute, the emery grinder, to destroy the grindstone would be to wreck the shop. A thorough study of the subject will develop more requirements than many think, and much ingenuity or skill in designing might be displayed in working out the problem. It should be strong, simple and clean; the trough expanded to catch as much as possible of the drip water and grit; a movable shield securely hinged to keep the water from splashing, and yet permit the stone to be used from either side; rests provided upon which to rest tools and the rod for turning the stone, these rests being arranged to move toward the center as the stone wears smaller. The bearings should be generous in size, proper provisions being made for oiling without washing the grit into the bearings with the oil, and the ends of the bearings being protected by some device which effectually prevents the entrance of the grit. The stone should be secured to the shaft by nuts and washers, and the washers fixed so that they can not turn with the nuts as they are screwed up or unscrewed. In hanging the stone, great care should be taken to hang it true sidewise, not only for convenience in using, but because a stone that is not true sidewise can never be kept true edgewise.

Suppose a stone to run one-fourth of an inch out of true sidewise, and while in motion draw a line around it within three-eighths of an inch from the edge, on an average. From this line there would be but one-fourth of an inch of stone on one side and one-half on the other. If you had a stone only this in thickness—that is, a stone one-fourth of an inch thick on one side and one-half of an inch thick on the other—would not the one-fourth-inch side wear away faster than the other? That is exactly what it does on that side of the thick stone, only the thicker the stone and the less it is out of truth the less it wears.

Coloring Metal.

A foreign paper gives the following: Metals may be rapidly colored by covering their surface with a thin layer of sulphuric acid. According to the thickness of the layer and the duration of its action there may be obtained tints of gold, copper, chestnut brown, clear aniline blue, and reddish white. These tints are all brilliant, and if care be taken to scour the metallic objects before treating them with the acid, the coloring will suffer nothing from the polishing. On making a solution of 640 grains of lead acetate in 3,450 grains of water and warming the mixture to 88° to 90°, it decomposes and gives a precipitate of lead in black flakes. If a metallic object be immersed in the bath, the precipitate is deposited upon it, and the color produced will depend on the thickness of the deposit. Care must be taken to warm the objects to be treated gradually, so that the coloration may be uniform. Iron treated in this way has the aspect of bluish steel; zinc, on the contrary, becomes brown. On using an equal quantity of sulphuric acid instead of lead acetate, and warming a little more than in the first case, common bronze may be colored a magnificent red or green, which is very durable. Very beautiful imitations of marble may be obtained by covering the bronze objects warmed up to 100°, with a solution of lead thickened with gum tragacanth, and afterwards submitting them to the action of the precipitate spoken of above.

Lubricants.—The evils attending the use of oils and fats as lubricants upon machinery are well known to engineers and mechanics, but the causes and nature of their injurious action are not so generally understood. We give, therefore, a brief but very lucid explanation of their action which we find credited to Dr. Marquardt, by our contemporary, the Boston *Journal of Chemistry.* The most obvious and least objectionable evil attending their use is the gradual oxidation (or gumming) which they undergo, and in consequence of which their lubricating qualities rapidly diminish. A more objectionable property of these substances shows itself when they are applied to such parts of machinery as are more or less highly heated. In such circumstances, these substances are decomposed into their constituents, glycerine and fatty acids. The latter combine with the iron work of machinery to form an iron soap, the metal surfaces being corroded thereby and fresh surfaces exposed to corrosion. Marquardt recommends the substitution of the mineral oils (heavy petroleum products that boil above 600° F.) for animal oils and fats as the remedy.

The Importance of Sanitary Engineering. Prof. Trowbridge, of the School of Mines, in a recent lecture before the Engineering Society, advised young engineers to give their attention to sanitary engineering, and reminded them that a problem worthy of the closest observation was the excessive cost of railroad transportation. The problem that now pressed upon them, said he, was of a social nature—how to prevent disease, and how to elevate the poorer classes. No doubt there would be a future in which the engineer, the capitalist and the statesman would unite for the promotion of human welfare.

Painting Walls—Seasonable Hints.

Of course, says the *American Builder*, everybody knows, or ought to know, that walls and ceilings are finished with plaster. But everybody may not be aware that plaster has the property of absorbing moisture. This, perhaps, will not take place in rooms where a fire is kept steadily; but in rooms left, as is often the case, for weeks without a fire, the walls will take up a considerable quantity of damp. The effect will be injurious to the health of the inmates. There are few persons who have not suffered from a mysterious cold, caught they know not how, though, perhaps, damp in the plaster had something to do with it.

The extent to which damp is absorbed in a plastered wall may be discovered by noticing what so often takes place in rooms where the walls are painted and have become chilled by a season of cold weather. As soon as the temperature becomes warmer the atmosphere is condensed on the walls, and at times in such quantities as to run off in streams. Now, had it not been for the paint, the greater portion of this moisture would have been absorbed by the plastered walls. And as a consequence the quality of the plaster would have been impaired and the room made unwholesome. In view of this effect in plastered walls, it becomes a question well worth considering, whether, in finishing a house, the walls should be papered or painted. If paint is decided on, it is highly necessary that the painting be properly done and good materials employed.

To Restore the Luster of Jewelry.—Take one ounce cyanido potassium and dissolve in three gills of water. Attach the articles to be cleansed to a wire hook, immerse and shake in in the solution for a second or two, and remove and wash in clean water, then in warm water and soap. Rinse again, dip in spirits of wine, and dry in boxwood sawdust. If the solution is kept, put it in a tightly corked bottle, and label *poison* conspicuously. One caution is necessary: Do not bend over the solution so as to inhale the odor, nor dip the fingers in it; if one of the articles drops from the hook, better empty the solution in another vessel.

Pigments from Coal.—Powdered coal is treated with nitric acid, or with nitrate of soda or potassa, and sulphuric acid. Then a portion of the coal will dissolve in caustic or carbonate of alkali, yielding a dark brown solution. A black residue remains behind, which may be used as a paint. The brown alkaline solution may be used at once, or a brown precipitate may be obtained by adding an acid.

Good Health.

The Cause of Consumption.

Dr. Rollin R. Gregg, of Buffalo, New York, is confident that he has solved the mystery of consumption. Regular physicians will be apt to say that he has mistaken a condition for a cause; nevertheless we are inclined to think that good may come from the emphasis he lays upon that condition, since it seems calculated to work a beneficial change in the customary treatment of the disease.

Dr. Gregg argues that as the loss of albumen from the blood through the mucous membrane of the kidneys in Bright's disease, rapidly and fairly depletes the system, much more must the more rapid loss of albumen through the mucous membranes of the lungs be serious in all its stages and speedily fatal in its results, if proper measures are not taken to stop such waste before fatal conditions have arisen. The expectorations of consumptives, and all their other catarrhal or mucous discharges from whatever organ, are mostly albumen and a direct loss of so much of this constituent from the blood. It is this wastage which causes the great emaciation characteristic of consumption, and not, he thinks, any failure of the system to assimilate food. And this loss of albumen does miscbief not only in robbing the muscles of their proper nutrition, but also in throwing the constituents of the blood into disproportion. The loss of one ounce of albumen destroys nearly a pound of blood for all purposes of healthy nutrition, and leaves in the blood a relative excess of 5¼ ounces of water, 7 ounces of blood corpuscles, 9 grains of fatty matter, 15 grains of fibrin, and 41 grains of salts. These elements in excess act the same as foreign matters in the blood, and disturb the entire economy of the system. Night sweats and dropsy are the result of the excess of water. The blood corpuscles left in excess are decolorized by the too watery blood, and are deposited in the capillaries or smallest blood vessels, where they shrivel and become tuberculous corpuscles, so called; the fatty matters in excess cause the fatty livers and other fatty degenerations attending the disease; the excess of fibrin causes the adhesion of the pleura to the inner surface of the ribs, the heart, or to each other, often among the most serious of the complications of consumption; and, finally, the excess of salts causes calculi, enlargement of the joints, ossifications, and similar morbid developments.

In such cases of consumption as are characterized in their earlier stages by an absence of profuse expectoration, Dr. Gregg would attribute the beginning of the disease to a loss of albumen through some other organ or organs, the shriveled blood corpuscles lodging in the lungs, starting tubercules there and setting up a dry cough, with the resultant irritation of the mucous membrane and outpouring of mucous. From this point of view, there is but one source of hope to the consumptive in any stage of the disease, and that is through the healing of the mucous membranes and the stopping of the waste of albumen. By this means, in the earlier stages of the disease—with all who have not inherited the most feeble constitutions—there is much to hope from judicious treatment.

Whatever may be the primary cause of consumption, it is pretty evident that the mucous discharge which attends the disease and finds relief in expectoration is to be repressed rather than encouraged; and to do this must radically change the usual treatment of the disease, at least in its early stages.—*Scientific American.*

Petroleum in Pulmonary Diseases.—The following is extracted from the *Bulletin de Therapeutique:* "Dr. Blache states that a refiner of petroleum having been prohibited by a *prefet*, at the request of some *pharmaciens*, from the distribution of petroleum in medicinal doses, this led to an inquiry being made as to its alleged utility in affections of the chest. The native petroleum from Pennsylvania and Virginia was that experimented upon first. It is a very safe substance, for even large quantities, when drunk by error, have caused only a little nausea. In chronic bronchitis, with abundant expectoration, it rapidly diminishes the amount of the secretion and the paroxysms of coughing, and in simple bronchitis, rapid amelioration has been obtained. Its employment in phthisis has been continued for too short a time as yet to allow of any opinion being delivered as to its efficiency, beyond that it diminishes the expectoration, which also loses its purulent character. The petroleum is popularly taken in doses of a teaspoonful before each meal, and after the first day any nausea which it may excite in some persons disappears. M. Gardy, a Paris *pharmacien*, has prepared capsules, each containing 25 centigrammes of petroleum, or, as he calls it *huile de Gabion*, from the name of an ancient petroleum spring, and this Dr. Blache considers as the most favorable mode of administering it."

Repairing the Eye.—Some curious facts have come to light about the regeneration of the eye during experiments made by M. Philipeaux; facts of a very pleasing kind if we only infer that what applies to inferior animals is applicable also to man. M. Philipeaux has been, it seems, anxious to discover whether ou completely emptying the eyes of young rabbits and guinea pigs, the viteous humor would be reorganized, and whether even the crystalline would be reproduced. With this view, he has been conducting his operations, always, of course, taking care not to touch the crystalline capsule, for experience has shown that in order that an organ shall regenerate, a portion of it must be left in its place. It seems that a month after the mutilation was effected, the experimentalist was able to state that the eyes, which had been emptied, were filled afresh, and that the crystalline was reconstituted. He operated on 24 animals, and in each case the multilated eye revived. This would seem to show that the optic organ has the same capabilities as the bones. The organic process repairs an evil and reconstructs, more or less completely, that portion which has been struck off from the whole.

Death from Toothache.—A Miss Stevens of Walton, Delaware county, died on May 1st of toothache. Although this is a rare occurrence, this is an undisputed case of death resulting from an excruciating toothache. The victim, who was a young American woman employed in a family in Walton, had suffered some days with a terrible toothache, which accompanied an ulcerated jaw. An attempt was made to extract the troublesome members, but her teeth were broken off and her face was too sore to permit their removal by the painful process of cutting away the gums. The girl suffered entire nervous prostration from the extreme pain, and gradually sank under it until death ended her sufferings. An army surgeon, who attended her, pronounced her symptoms the same as those following the amputation of a limb.—*Middletown. N. Y., Press.*

Wearing Garters.—If garters are worn, it is important to know how to apply them with the least risk of harm. At the bend of the knee the superficial veins of the leg unite and go deeply into the under part of the thigh, beneath the ham-string tendons. Thus a ligature below the knee obstructs all the superficial veins; but if the contrivance is above, the ham-string tendons keep the pressure off the veins which return the legs. Unfortunately, most people, in ignorance of the above facts, apply the garter below the knee.

The Board of Health of Carlsruhe, Baden, publishes a notice stating that chemical analysis shows that the outer portions of the packages of American canned beef which have been in contact with the tin of the case, are impregnated with lead, and are injurious to health. Consumers are advised to cut off a thin paring on all sides of the package before using the meat.

Oatmeal Relish.—Fill a saucer nearly full of well-cooked oatmeal. Now fill the oatmeal full of strawberries (pressing them in), ripe peaches, ripe pears, or some such fruit. Add a little sugar and cream. It is a rich and delicate dish.

MINING AND SCIENTIFIC PRESS

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Litton Springs Park Association, of Sonoma Co., Cal.

The Week.

The gradual and steady influx of Eastern capital into our mining stock market, has apparently so frightened the manipulators of "black Friday" peculiarities, that a mouthpiece in the person of Alex. Delmar has taken the trouble to relieve his mind in a disreputable letter to the New York *Sun*, in which he warns Eastern people against our bonanza and quartz mines generally, asserting that the Comstock lode is used up, and that California's current product of $15,000,000 in gold is derived chiefly from hydraulic mines, and that these latter are choking up our rivers, filling up our single harbor, and utterly ruining our agricultural lands. No excitement has been created by this monstrosity, the facts are patent that quartz mining on this coast is entering a period of unexampled prosperity.

From all authentic sources, new and paying gold mines are being opened in greater number in this State now than at any other time. In the Bodie district there is more wealth in sight than ever before, and all the indications for the future of most other districts are most favorable.

The most discouraging point about Leadville is that the gold supply is not permanent, slight deposits, although Senator Jones in an interview asserts that "the yield of 1879 will be so large as to create a new era in mining, and show our capitalists that these mines are one of the great sources of the wealth of our country, and that this year promises to be as memorable in its mining excitement as the year of the bonanza discoveries." It is a fact, however, that Leadville is over-crowded. From all of the mining districts come reports so favorable, that to particularize would be regarded as an affectation.

The Groans of the Alaskans.

A few months since the country was startled by a cry for help from the white settlers of Sitka, the capitol of Alaska, to prevent their threatened massacre by the Indians of that Territory. This appeal for aid was so fervent and urgent, that a British man-of-war was dispatched by the English authorities at Victoria to prevent if possible this impending disaster. Since that time the leading journals throughout the United States have commented strongly and even bitterly on the attitude into which our government has been brought toward that Territory through the weakness and inefficiency of our navy, animadverting with no little asperity on that niggardness of Congress that has forced us to have recourse to the aid of a foreign power to protect American citizens on American soil. The isolation of Alaska, its inaccessibility, the supposed rigor of its climate, and the savage ferocity of its native tribes have all tended to retard its exploration and colonization, the condition of affairs having meantime been greatly mystified through the conflicting accounts that from time to time have appeared in regard to them. A few of the more salient points connected with the geography, wants and resources of this region may be epitomized as follow: Alaska, as far as commercial relations and native population are concerned, may be divided into two distinct regions. The first of these, according to W. H. Dall, of the Smithsonian Institute, lies to the north and west of Mt. St. Elias and is inhabited by Indians and Esquimaux, who are entirely friendly and in no way dangerous to the whites. One portion of them—the Aleuts—are semi-civilized and have of course the fault of occasional drunkenness. The second region lies to the east and southeast and is peopled by a race entirely different ethnologically from the Esquimaux and Indians. These in their own language are called "Khinkets," while to the settlers on the coast they are generically known as "Sitka Indians." Unlike their northern neighbors they are a cruel, reckless, impudent and murderous set of savages, little disposed to respect anything less than the overawing influence of the government. They are ruled wholly by their passions, and when drunk or otherwise excited hesitate at nothing that interferes with the gratification of their desires. The country they inhabit is densely wooded with spruce, pine, fir and other conifers, useful and available for timber. The climate is about that of southern New York, the summers being wetter and cooler and the winters mild. That this region is fertile and productive has been practically shown by the successful culture here of potatoes and vegetables of various kinds, as well also as of the grasses and we believe the cereal grains.

The mineral wealth of the country, with the exception of coal, remains largely to be determined. Gold, silver, iron, manganese and other ores are known to exist, but how far they will hereafter pay for the working is a matter of speculation.

It is the southern portion, the seat of the late troubles, towards which attention is now more particularly directed. The chief governing influence over all this region is that exercised by the Alaska Commercial Company, which has a monopoly of the fur trade and as far as possible applies the law and keeps the Indiane in subjection. But apart from this there is no settled government, and from the company's inability to protect the lives and property of the white settlers and traders, has arisen the question whether the white inhabitants of Alaska, citizens of the United States, are entitled to such protection and government as shall suffice to shield their lives and property from the rapacity and cupidity of the savages? Clearly they are, the only point of difficulty being how, in view of their remote position, their limited numbers and the scanty resources of the country, this protection can be best extended to them. An organized government is hardly called for. Regular troops stationed there could protect only a few points and accomplish but little good, the same being nearly true of cruisers along the coast, while neither soldiers nor armed vessels would effect anything towards opening up and exploring the interior. This can be best effected by inducing a mining population to enter the country and commence the search after gold and silver. To promote this the government might find it expedient to aid and encourage a movement of this kind in the first instance. Facilities might be afforded adventurers for reaching the Territory in public vessels, something being contributed also toward their outfit, with a little assistance towards getting them up the rivers, and the promise of helping them out of the country should they wish to return.

Such, it strikes us, is the true way to settle this Alaska problem. If the precious metals abound in that region these pioneer prospectors will soon find them, and our public officials will need trouble themselves no more about the exploration and settlement of the country, the protection of its inhabitants, the organization of a Territory, nor any of these other matters that now so worry and perplex them. The care of this whole business will be taken off their hands by the first emigration that reaches the country, and the latter from a dead weight will be speedily converted into a self-sustaining agent. With a considerable mining population thrown into Alaska the Indians there would cause but little more trouble, the better class of them heeding themselves to peaceful pursuits and living in harmony with the whites, while the more savage would meet with early extinction. If there is not enough of the precious metals in these our more northern possessions to draw in and retain there a good many miners, they can never or at least for a long time become much populated, and may as well be given over, certainly for the present, to the Aleska Fur Company and such others as may desire to carry on fishing, trapping and kindred callings in the woods and waters of that distant and gloomy region.

California Mines in More Request at the East.

From an old resident of this State, and who for a number of years has had much to do with placing mines on the Eastern market, we learn that there is more inquiry in that quarter for California gold mines at the present time than ever before. Having tried investments in stocks, and experimented some with the mines of Colorado, Nevada, Utah, Arizona and other of the outside States and Territories, these Eastern parties are disposed now to buy mining properties in this State, and carry on the business here in a practical way. They have well considered, what we have so often said and so constantly insisted upon, how much more safe and satisfactory the business of mining has proved to be in California than in these other countries. All that is required now to encourage this inclination on the part of the people abroad to invest here, and so insure for our mining industries a greater prosperity, is a willingness on the part of mine owners to dispose of their claims or interests therein at reasonable figures, coupled with a disposition to act justly and fairly all round.

There is no denying that in the matter of selling mines very extravagant ideas have prevailed in regard to the value of these properties, and that purchasers have as a general thing paid too much for them. In most cases the sellers have fared better than the buyers, for the reason that the former have been apt to entertain exaggerated notions about the value of their mines, while the latter have not figured with so much closeness in these as is their wont in other business transactions. Because they have to do with the production of gold and silver a vague idea obtains that this class of enterprises ought to yield profits irrespective of careful calculations and close economy. This is a false and dangerous assumption, and should no longer be acted upon. Buyers should be as circumspect and exacting in purchasing this as any other kind of property.

As regards the value of this species of property, none are apt to entertain such wild notions as the veteran miner. He is the most hopeful, confident and sanguine person that lives. The calling implies the possession of these qualities on the part of those who pursue it. The doubting and distrustful take none of the hazards involved in this business, preferring smaller gains with greater certainty. But your genuine miner sees everything in glowing colors and loves to take desperate hazards if only there be one chance in a hundred to strike a big thing. He is prone to over-estimate, one great success so impressing his imagination that he forgets a thousand failures. He is often misled, not by others, but by his own wild fancies, and so becomes the means of misleading others who repose confidence in his judgment and experience. It is the case too that these mine vendors have sometimes been guilty of very sharp practices. So frequently has this happened that the phrase "honest miner" is with many deemed to have only an ironical signification. Sometimes too the veteran miner will, with the best intentions, sadly miscalculate, and occasionally his intentions are none of the best. And thus it comes to pass that both he and others suffer loss through his errors of judgment or his errors of intention. It is to be hoped that this growing interest in the mines of California will be met in a spirit of such fairness and liberality as will tend to give it further encouragement, and that parties who have mining properties for sale will not insist upon the purchaser paying for the same a little more than they are worth, and taking all the hazard besides.

While speaking in our last issue of mines lately disposed of to Eastern parties, we were in error in saying the large hydraulic property mentioned was sold by Mr. Leet. That gentleman has, as stated, large sums deposited to his credit for the purchase of California mines on Eastern account, but was not the vendor of the hydraulic property alluded to, our informant having got two transactions mixed.

The Eclipse of 1880.—Mr. A. F. Goddard, of Sacramento, is preparing an excursion party of 50 or more to observe the line of the total eclipse of the sun, which will occur next January, visible in California. His object is to locate the excursionists along the route of the total shadow, selecting the grandest points of view, establishing the line by appropriate monuments from the coast to the Sierras. We have no doubt such an excursion in advance of the eclipse would be productive of much pleasure as well as a means of verifying astronomical calculations.

Dry Amalgamation.

The plan of dispensing with the use of water in effecting the amalgamation of quicksilver with the precious metals, appears to be growing in favor with our millmen and practical metallurgists. Ever since the attention of the mining public began to be strongly called to the advanteges of this method through the partial introduction of the Paul process, for crushing and amalgamating the ores of gold and silver wholly dry, it has been gradually working its way into a larger use. That this should have been the case is not surprising. When we consider the percentage of loss that attends humid amalgamation, it seems strange that the dry plan has made so little progress, its superiority having been so clearly proven through the many successful trials of the Paul invention.

From Mark Silver, a young man who has had a good deel of experience in milling ores, we learn that one of the Paul crushers, supplemented by a novel method of amalgamation, has been employed for the past six months with gratifying results in the mill of Chas. D. Smyth, at Murphy's Camp, Calaveras county. The ore here, after being pulverized and brightened in the manner peculiar to the Paul machine, is dusted on a copper-plated, mercury-coated cylinder which revolves in a dust proof chamber. The instant the gold so brightened touches the quicksilver it is taken up even to the finest atom, while the base metals and all other refuse matter are rejected and thrown into the stream below, none of these latter during their brief contact being able to attach themselves to the surface of the revolving cylinder. For the purpose of cleaning up, a lathe rigged with a hard piece of rubber is brought to bear against the cylinder while in motion, relieving it effectually and so readily of the amalgam that a delay of five minutes suffices for cleaning up the mill. With the aid of these appliances gold-bearing quartz has been worked in large quantities with much greater closeness than it is possible to do with arastras; and so manifest are the advantages of the mechanisms here employed that a great revival in quartz mining is likely to ensue in the district mentioned. The miners in the neighborhood are bringing in their ores freely to Mr. Smyth's mill to have them reduced by the new method, preferring to pay from six to seven dollars per ton to have them so treated rather than crush them free of charge in their own arastras, or pay even so much as two or three dollars per ton for having them worked in the old-style quartz mills. The ores here being usually of good grade they can well afford to pay this difference, as Mr. Smyth returns them fully 30% more gold than they can get having their ores treated by any other process. From some lots of ore reduced at this mill highly satisfactory returns were obtained, though they were so base that they could not be worked with any profit where amalgamation with water was practiced.

This experiment has created a demand for a 20-stamp custom mill at this nearly defunct camp, and so much new life has this improved prospect infused into the miners that there will probably be as much as 40 or 50 additional stamps required there within the next six months. The cost of outfitting and running this is not greater than of the old-style mills—indeed, we suppose it is somewhat less.

Almarin B. Paul, the originator of the process that bears his name, has well explained in his pamphlet descriptive of the same, the advantages of amalgamation by the dry method as well as the greater cheapness of the machinery employed in its practice, which latter he argues commends strongly his plan where economy in preliminary expenditure becomes a controlling consideration. That mercury when performing this office of gathering up and holding the precious metals should be used without the intervention of water would be inferred irrespective of results reached in practice. The disposition that exists between these several metals to unite being due to affinity or attraction, that the interposition of a bad conductor like water should tend to weaken that power stands to reason. Overman, a high authority in chemical and metallurgical science, remarks on this point as follows: "All metals appear to have a tendency to float in water, when in fine particles, some more than others. This is caused by a particle of gas—either air or water gas—adhering to the particles of metals, which *causes them to float. Precious metals appear to possess more of this quality than others.*"

Taking up the hint contained in the above extract, Mr. Paul enlarges upon it in substance as follows: Water adheres tenaciously to whatever it touches. Through its use in amalgamating we put in the first place a jacket of water about every atom of mercury and gold and silver, whereby their metallic surfaces are kept from actual contact, and then proceed to agitate and grind them with a view to destroying this covering and compelling them to unite. Now water is repulsive to the precious metals, and no union can take place between them except forced by gravity or friction. But this friction produced between iron surfaces tends to eliminate the repulsive elements that reside in all ores, and being so brought out coat with a gaseous film the precious metals they contain, and so place a barrier between them and the mercury. In dry amalgamation the mercury comes in direct contact with the particles of metal, and of course performs its duty with greater efficiency.

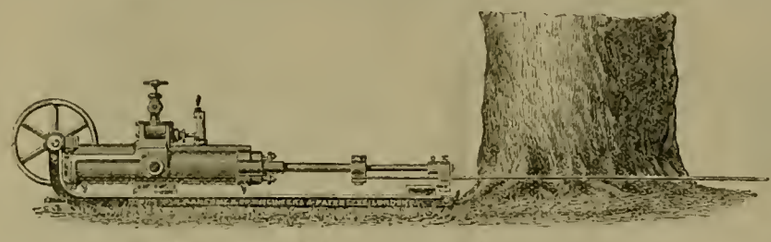
Ransome's Patent Combined Steam Tree-Feller and Log Cross-cut Saw.

We present to our readers in this issue various representations and a detailed description of the above novel and useful machine, for which Mr. Walter Laidlaw, of Oakland, Cal., has been appointed general agent for the United States.

The want of a really efficient machine which would effect a substantial economy over the tedious process of felling and cross-cutting trees by the axe or hand-saw, has caused a great many attempts to be made to achieve this result by the employment of steam power; but the machines hitherto invented for this purpose have failed, in consequence of being so complicated and troublesome to fix, that the time expended in moving them from tree to tree, and preparing them for work, has more than counterbalanced any saving which they effected when actually cutting. The simple little tool represented in three views, is not open to this objection, as it can be firmly fixed to any tree which it is required to fell or cross-cut in less than two minutes, the agent tells us: and as the medium size (which will fell trees up to four feet in diameter) is less than four cwt., it can be readily carried about by four men. It works with incredible rapidity, sawing down a hard wood tree three feet in diameter in less than five minutes, we are informed, and attended by a gang of four men. One machine will, with ease, fell eight such trees in an hour, including the time occupied in moving and fixing it. As it will work in any position, it will fell trees growing on slopes, and by simply shifting the working parts into another frame, it becomes an excellent cross-cut saw for cutting logs to length as they lie upon the ground. All the working parts are very simple, and by the aid of the printed instructions accompanying each machine, any man of ordinary intelligence can work it.

The chief advantages claimed for this machine, are: 1. That it effects a great economy of labor, as one machine attended by a gang of four men will do more work than 30 axmen. 2. That it effects a great economy of timber, for as it saws the tree off close to the ground, it saves all that portion of the tree which would be cut into chips, if felled with the ax. 3. That the ground cleared by the tree-feller can be left absolutely level, for by simply removing a sod four and one-half inches thick, the saw works on a ground line, and, consequently, the stumps do not obstruct the passage of carts, etc. 4. That used as a cross-cut saw, it will cut logs to exact lengths, and as its cut is perfectly square, it consequently obviates the expense of trimming the ends of lumber in the mill.

The machine consists of a steam cylinder of small diameter having a long stroke, attached to a light wrought-iron frame, upon which it is arranged to pivot on its center, the pivoting motion being worked by a hand-wheel turning a worm, which gears into a quadrant cast on the back of the cylinder. The saw is fixed direct to the end of the piston-rod, which is made to travel in a true line by guides, and the teeth of the saw are of such a form as to cut only during the inward stroke. By this simple device, saws as long as nine or ten feet can be worked without straining apparatus or guide, as its own cut is sufficient to guide the saw in a straight line through the tree, and as the teeth offer no resistance to the outward stroke, all possibility of the saw buckling is avoided.



RANSOME'S PATENT STEAM TREE-FELLER—SIDE ELEVATION.

The machine is supplied with steam at a high pressure from a small portable boiler, through a strong flexible steam-pipe; and as this may be of considerable length, the boiler may remain in one place until the machine has cut down all the trees within a radius which is determined by the length of the pipe. When fixed for felling, the machine is merely laid on the ground and set fast by a strong screw to a trident pointed bar, which is driven firmly into the tree with a few blows of a sledge-hammer. When fixed for cross-cutting, it is held by a hinged dog-hook, driven into the log close to the saw.

The perspective sketch shows the manner in which the steam tree-feller is applied in the woods for felling and cross-cutting. Steam is supplied from a special boiler, made as light as possible, consistent with sufficient strength to resist a working pressure of 100 pounds to the inch. The boiler is mounted on a four-wheeled carriage, upon which provision is made for carrying the tree-feller with its hose and tools. The boilers are made with large fire-boxes for burning waste-wood, etc.; and each is fitted with a safety-valve, blast-pipe, steam pressure gauge, water gauge, donkey pump, whistle, water-tank and set of stoking tools. A boiler for working a single tree-feller of the medium size should be of four nominal horse-power; but when one boiler works two machines, as shown in the engraving, it need not be more than six horse-power, as it would rarely happen that both the tree-feller and cross-cut would be requiring their full supply of steam at the same moment.

For logging, getting out railroad ties, shingle and cedar bolts, posts, cord wood and ship-knees, a machine of this kind will be found most invaluable. Any boiler of a portable engine, capable of maintaining a working pressure of 50 pounds on the square inch, may be made available for supplying it with steam. In places where a large portable engine can travel, the boiler of the same may be used for driving two, three or four tree-fellers at once, and thus one stoker can be made to serve several machines. Four men suffice to work any size of tree-feller, namely, one to operate the machine; one to drive the wedges into the cut, to prevent the tree from pinching the saw, and to control the direction in which it falls; one to stoke the boiler, and a fourth to assist generally. When the machine is required to be moved from tree to tree, all four men are available for that purpose.

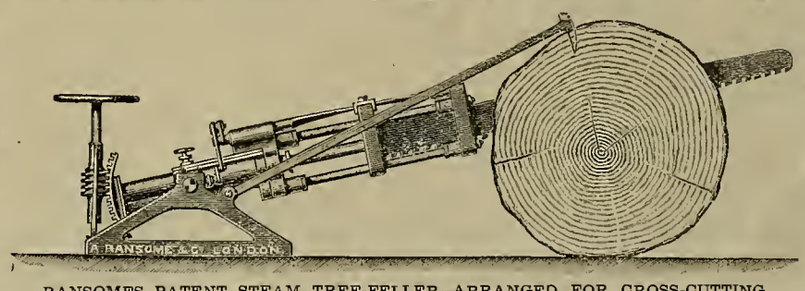
The foregoing description refers more particularly to the medium sized tree-feller, which will cut down any ordinary timber, but the larger size, which fells trees up to six feet in diameter, is necessarily somewhat heavier. It may be carried suspended from the axle of a small two-wheeled carriage resembling a light "timber jim." When so slung, two men can move it about with the greatest ease.

This patent steam tree-feller having been thoroughly tested on a great variety of trees, ranging from one to seven feet in diameter, the result of its working given above may be guaranteed. The jurors of the forestry class at the Paris exhibition last year, after seeing it at work, marked their appreciation of it by awarding it a special silver medal.

Although they have been but a few months in the market, the steam tree-feller has already found its way into many distant parts of the world, including the East and West Indies, New Zealand, Australia and Japan; and the rapidly increasing demand for them is the best proof of their practical success. They are made of three sizes, as under, and may be had either as tree-fellers or cross-cut saws, or as combined machines with interchangeable frames for both purposes.

Size.	Diameter of largest tree.	Weight of machine.	Power of Boiler Required.
No. 1.....	2 feet	3 cwt.	2-horse power.
No. 2.....	4 feet	3½ cwt.	4-horse power.
No. 3.....	6 feet	5½ cwt.	6-horse power.

PERSPECTIVE VIEW SHOWING TREE-FELLER AND CROSS-CUT SAW AT WORK.



RANSOMES PATENT STEAM TREE-FELLER—ARRANGED FOR CROSS-CUTTING.

Mines and Minerals of Algiers.—It appears from the last report of the French Minister of Public Works that France and Algiers are rich in mineral resources which are only partially productive, owing to the indisposition of capitalists to invest in the mining industry. Algiers particularly contains immense mineral deposits, which have been but imperfectly inspected. In spite of this Algiers exported during the past year iron, copper and lead to the value of over 6,000,000 of francs, and the exportations of these metals during the past decade are valued at over 44,500,000 francs. This production is but a small portion of what might be exported were the mines to be developed by capital. The mines of Kef-Ourn-Theboul, Cape Cavallo, in the province of Constantine, and of Gar-Rouhau, in Oran, contain rich veins of argentiferous galena. Antimony, mercury and zincare found in paying quantities in El-Hammemat, Ras-el-mas, south of Philippeville, and in Constantine and Oran. The minister complains of lack of capital and economical transportation, and hopes that government will supply the deficiencies.

Immigration to the United States is now at the rate of nearly 4,000 persons per week, and steamship companies are about to "hull" steerage rates.

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The public generally and Hydraulic Miners especially are bereby notified that any parties making or using the contrivance known as the HOSKIN DEFLECTOR will be prosecuted to the full extent of the law, said machine having been declared by the U. S. Circuit Court an infringement upon my patent, tbe

Bloomfield Deflecting Nozzle.

The public are also cautioned against using the Hoskin Deflector because of its danger to life and limb, this device haviug already occasioned several deaths and other erious accidents. The BLOOMFIELD DEFLECTOR is entirely safe, its two and a half years use without accident, as well as its construction, proves it to be a reliable contrivance.

Any parties wishing to purchase the right to use these Deflectors can do so by applying to the undersigned,

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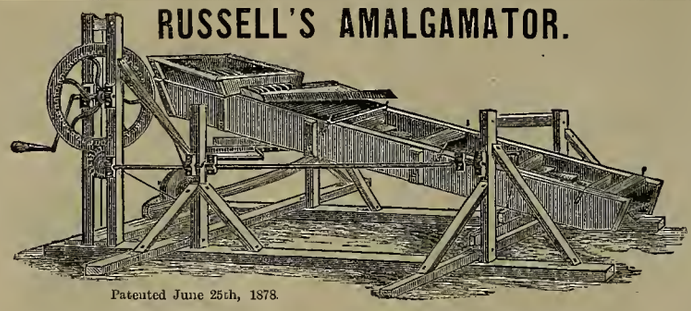

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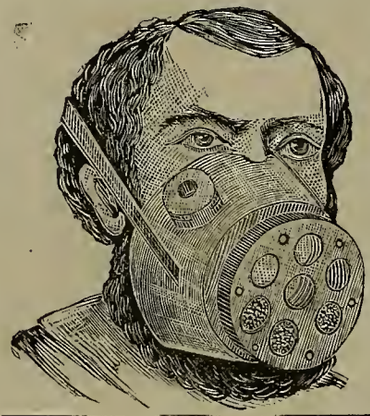

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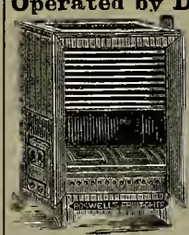

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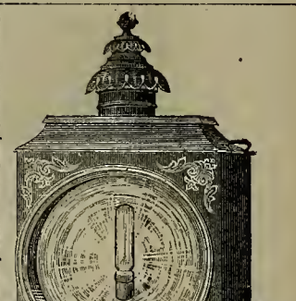

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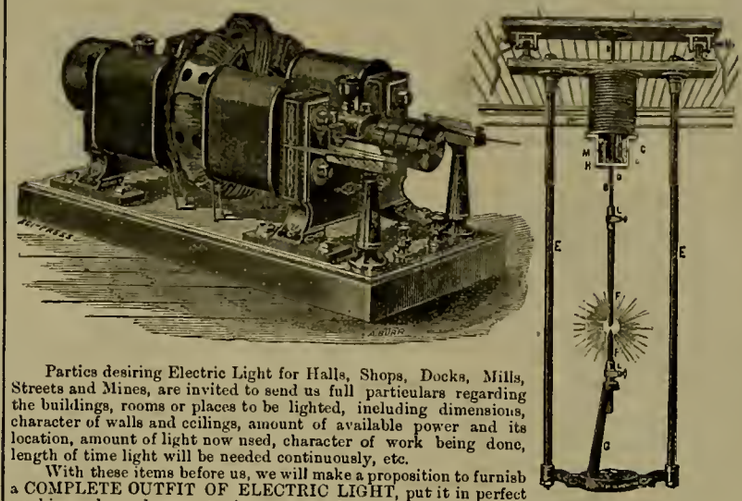

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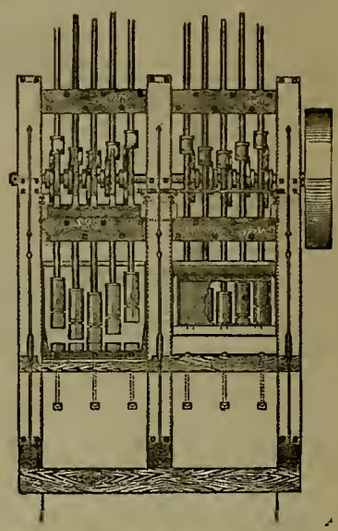

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FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold r Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

No. 145 Broadway, - - NEW YORK.

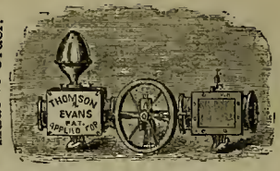
J. THOMSON. C. H. EVANS

THOMSON & EVANS,

(Successors to THOMSON & PARKER.)

Engineers and Machinists.

Rubber Suction HOSE Made to Order.



All Sizes of Gas and Tube FLANGES.

Steam Pumps, Steam Engines, Hoisting, Pumping, Quartz Mill, Mining, Saw Mill Machinery, Specialties.

Plans and Specifications for Machinery furnished. Repairing promptly attended to.

110 & 112 Beale St., San Francisco.

THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per ton. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco.

Dewey & Co {202 Sansome St.} **Patent Ag'ts**

Continued from page 381.

are opened up a trifle more there will be a big excitement about the camp.

ITEMS.—The Paradise company have 20 men at work sinking winze from 2d to 3d level. This winze will open the ledge 109 ft between the levels; 1,600 tons of ore now await the completion of the mill. The Big Prize is producing considerable rich ore; 125 tons which will work about $200 to the ton have been extracted in the past three weeks. The Bullion has suspended work for the present. Building an ore road. Plenty of ore in sight. The Gulch ledge is producing some very rich ore. A vertical shaft, 60 ft deep has been sunk, cutting the ledge at that depth. A rich strike has been made in the Rattler, 45 ft from the surface. Ore streak one foot thick, averaging $267 per ton. The Sedan mill is running steadily, and working ores up to 80% of their assay value.

ARIZONA.

STONEWALL.—*Silver Belt*, June 4: The Stonewall mill, although running but five hours out of the 24, in consequence of the scarcity of water, is turning out bullion at the rate of $200 per hour. We think it will not be long before a full supply of water will be obtained, and as the ore is abundant, the mill will then run on full time.

COPPER MINE.—Probably the largest and richest copper mine in the world, exists in Yavapai county. It is said to be a solid wall 18 ft wide and a mile long, and of great depth.

COLORADO.

LEADVILLE.—Denver *Tribune*, June 4: Nearly every ft of land is being prospected, and miners' cabins may be found on every hand. On Carbonate hill, since the Pendry strike, there has been prospecting going on in every possible direction, and some of the holes are very promising One can stand near the foot of the hill, just above the city, and count no less than 30 prospect holes and mines on the west side of the hill alone, many of which have been started since the Pendry strike was announced, a month ago. This last mentioned mine offers to be one of the best in the camp. The ore is high grade, easily mined, and is found in large quantities. It closely resembles the ore found in the New Discovery and in the Pittsburg group generally. The discovery of this deposit so far below any other pay streak yet found upon this hill, has put nearly all the mining experts at fault. With but few exceptions they have all held that there was but one deposit or stratum, if you please, of these peculiar ores, and when once past the "contact," it was useless to examine farther. The Pendry lies within 500 ft of the Crescent, running at right angles, or nearly so to that claim, and about 30 ft in a vertical line lower down the hill. The deepest workings of the Crescent are scarcely more than 75 to 100 ft below the surface of the ground, while the Pendry deposit lies 200 ft below. That there are more deposits than that one I have no doubt. That this deposit in the Pendry is not the same upon which the Crescent, Carbonate, Ætna and others are working, I am equally as well convinced. It is scarcely possible that such a break could occur in the Crescent deposit as is suggested by some of the mining experts. The dip of the Pendry deposit does not warrant such an hypothesis as this, but, on the contrary, seems plainly to indicate that the Pendry is another and a distinct deposit from the upper one, upon which the other mines are now at work. If it shall eventually turn out (as I firmly believe it will) that there are several of these deposits—one overlying the other—then the future of this camp is beyond question. The character of the mineral may change, after two or three layers have been passed, and true fissure veins appear at a great distance below the surface. I make no doubt that before summer fairly sets in there will be 20 mines on Carbonate hill that will take out paying mineral in good quantities. The cost of smelting has been very much reduced during the past two weeks, so that ore which was of comparatively little value then has been brought into pay now. Still, there are but very few mines that will take out any more mineral than is necessary for development, preferring to wait a more auspicious time, when the returns will be much greater.

LITTLE PITTSBURG.—The Little Pittsburg silver mining company, of Leadville, Colorado, have declared a dividend of $50 per share, aggregating the nice sum of $100,000, payable on June 7th. This company have extended this courtesy five times before to stockholders, making, with the pending dividend, $600,000. Colorado is receiving more attention than usual as a mining section. Her bullion product for 1878 was $9,820,700, the largest in her history. But that amount will probably be exceeded this year. Since 1859, it is estimated that Colorado has produced over $81,000,000 in bullion.

IMPORTANT DISCOVERY AT HILLERTON.—A short time ago a rich vein was found about two miles from Hillerton, on the Gunnison, by R. H. Hammil and others. The vein is a two and one-half ft crevice of virgin or crystallized quartz, identical with that found in California and Australia. The ore is said to assay $3,400 not 10 ft from the surface.

IDAHO.

YANKEE FORK.—*World*, June 3: John Hepburn, who came in from Bonanza City, a few days ago, inform us that there are now 400 or 500 men in that place, and hundreds more are coming. He predicts that 5,000 people will go to that and the adjoining camps during the next two or three months. The wagon road from Challis to Bonanza City will be completed in two or three months, when two mills will be shipped to the latter place. Men going to Yankee Fork in search of employment will be disappointed. There are as many miners there now as can find work. A specimen of ore from the Norton mine, in Yankee Fork district, was worked at Idaho City, which weighed just 7½ ounces, and yielded about $10 in gold. This would make the ore worth about $10,000 per ton.

SNAKE RIVER.—*Statesman*, June 5: The accounts from Salmon falls are flattering; everyone getting rich on the Miles bar. Glenn & Co. comes next with a water ditch nearly completed on ground where there was $4 per day made with a rocker. Corker, Parsons & Co. are getting an engine to hoist water on their ground below Lewis' Ferry, and expect to be running soon. Clark & Co. are running on Cold Spring bar, and are making money very fast. Lang, Snyder & Donohue are putting up a machine on the ground adjoining Clark & Co, and will be running in two or three days. Blackwell, Delano & Glenn have ordered plating, and are busy bringing a ditch on their ground from Clark's ditch. There are parties surveying a ditch to bring water out of Snake river, on Black & Co.'s ground, four miles below Cold Spring.

MONTANA.

THE GAGNON.—*Mirror*, June 3: The Gagnon mine, near Butte, yields rich ore of two kinds, viz., rich free-milling ore from the croppings to the depth of 60 ft; then high-grade, argentiferous, copper, smelting ore, from a vein which is quite narrow in its upper portions, where it approaches the free-milling ore but widens to an average of four ft in the lower or 150 level. This mine became a heavy dividend-paying mine almost the week after it was opened. Ore has been taken out of the lower level which samples 30 ounces of silver to the ton. Although opened 100 ft below water level, the mine contains but little water.

NEW MEXICO.

ITEMS.—*Grant County Herald*, May 31: Both mills and two new furnaces are at work. The week's yield of silver is something over 4,000 ounces. The receipts of gold from Pinos Altos, during the present week, exceed the receipts of any previous week during the past 12 months. Extensive reduction works, we are informed, will be erected at Los Cerrillos. The owners of the Mina del Tiro have contracted to furnish 30 tons per day to the proposed works from that mine, and as they have hundreds of tons of fine ore in stope, no chances of a lack of ore to keep the new works in operation need be feared. In the meantime, the miners can be developing their claims with the assurance that they will have a home market for their ores. The Mina del Tiro has a large amount of ore in sight that will run 140 ounces to the ton, in addition to an inexhaustible quantity of lower grade. Two newly-opened mines near Santa Fe, New Mexico, have been named, respectively, the U. S. Grant and the Globe-Democrat. They are perfect boomers in the quantity of precious metal which they yield.

UTAH.

MINING NOTES.—Salt Lake *Tribune*, June 6: The Germania smelting and refining works will be under full headway in a few days. A scarcity of ore has prevented them from running all of their stacks. The Union Pacific Express Company received from the Christy mill yesterday, one bar of bullion, $2,169.97; two bars from the Pioneer mill, $2,662.95; and six bars from Park City, $4,488.-15; total, $9,321.67. Yesterday, Wells, Fargo & Co. received two bars of Horn Silver bullion, $4,000; and five bars of silver from Silver Reef, $4,613.41; total, $8,613.14. Since our last report, Warnock & Co. have received 158,-467 pounds of Horn Silver bullion. Pig lead is in demand in the Salt Lake market. Mr. Scott informs us that he has had calls for the past two weeks for the article, and now has orders for two tons, but as there is none in the market, he is unable at present to supply the demand.

News in Brief.

MOUNT ETNA is quiet.

EMIGRATION to Liberia continues.

BARLEY is $1.75 per 100 in Maricopa, Arizona.

MINING timber in Silver Reef is quoted at $35 per M.

SAN BERNARDINO complains of 104° in the shade.

ONE thousand six hundred Chinamen expected on next steamer.

CALIFORNIA peaches sell for 50 cents a pound in Salt Lake City.

THE St. Gothard tunnel will be completed by the end of November.

LONG suffering crops of Salt Lake were helped by rain on the 6th inst.

SENATOR DON CAMERON has 11 acres of tobacco in on his farm at Mariette, Penn.

LEADVILLE has some 35 smelters, with a capacity of some 1,200 tons per day.

THE late fires in San Diego county were caused by spontaneous combustion.

ONE thousand five hundred and seventy prisoners in San Quentin on May 31st, ult.

A NUGGET of gold worth $102 was picked up at Prairie Diggings in Grant county, Oregon.

A SALT spring has been discovered in the Little Colorado; a pound of salt to the gallon of water.

MARS and Saturn will connubiate some time next mouth. The former will quite conceal the latter.

ORANGES and strawberries for sale every day at Mammoth City, and natural ice cream every night.

GRASSHOPPERS continue their ravages in Sierra valley. Many farmers have suffered severely.

HAILSTONES weighing from five to twelve ounces fell thick and fast at Wichita, Kansas, on the 9th inst.

THE better part of Silver Reef, Washington county, Utah, was destroyed by fire on the 31st ult. Loss over $250,000.

ENGLAND has but one sugar refinery, producing 20 tons of loaf sugar per annum, while the San Francisco refinery produces 35 tons.

A FAMINE is predicted in Russia by Russian journals. Cause—war, drunkenness, holidays, cattle plague, beetles, marmots and mortgages.

IT will require 300 years to flood the Colorado desert, according to Fremont's plan, so says a Los Angeles mathematician. We can't wait.

THERE was in the State treasury June 1st money to the amount of $1,624,418.66. Gold, $1,369,300; silver, $225,679.87; legal tenders, $9,438.79.

THE Oil City *Derrick* states, in a resume of the month of May last, that 390 wells were completed in the oil regions with a production of 9,002 barrels, a slight decline.

THE rise in the price of silver has slightly stimulated the demand on the United States Treasury for standard silver dollars. The West is now ordering more of this coinage than ever before.

MR. EADS says that no dredge boat has been used at the South pass jetties during the past ten months, all reports to the contrary notwithstanding. The channel is now able to take care of itself.

FREIGHT from San Francisco to Hong Kong, by steamer, $6 per ton; distance, 7,000 miles. Freight from Oakdale to Sonora, Tuolumne county, by prairie schooner, $15 per ton; distance 35 miles.

ST. LOUIS is to have a new museum of fine arts. Ground was broken last week. The material to be used is stone from the Bedford quarries of Indiana. It will be ready for dedication in 12 months. Cost $80,000, a donation by Mr. Wayman Crow. Now, Chicago!

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Northern Belle, from June 2d to June 7th, inclusive, $8,794.20; California, June 7th, $99,-022.58; Hillside, June 8th, $5,400; Ophir, June 7th, $22,134.13; Argenta, June 9th, $10,500; Independence, June 9th, $10,600; Indian Queen, June 2d, 4,520.05.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

BLACK ROCK M. CO.—Object: To mine in El Dorado county, Cal. Capital, $400,000. Directors—John Tipp, N. T. Root, H. J. McLoire, C. H. Leavitt, C. F. Travero.

BODIE CON. M. CO.—Object: To operate in Mono county, Cal. Capital, $10,000,000. Directors—C. A. Burgese, John F. Boyd, George B. McAueny, George W. Sessione, Lewis Teese, Jr., Thomas Bell, William H. Lent.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING JUNE 3D, 1879.

216,140.—HYDRAULIC PROPELLER—B. B. Brewer and B. B. Ward, Sacramento, Cal.

216,089.—HORSE-POWER—L. Herbert and W. V. Henry, Hicksville, Cal.

216,098—DOOR-KNOB ATTACHMENT—D. & T. Morris, S. F.

8,740.—LUBRICATOR—N. Seibert, S. F. (re-issue).

216,244.—SCREW-PROPELLER—John B. Ward, S. F.

216,061.—DREDGING-SCOOP NOZZLE—S. W. Shaw, S. F.

216,150.—CORSET—Geo. H. Clark, Portland, Ogn.

216,148.—ORE-ROASTING FURNACE—D. W. Brunton, Silver Peak, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SELF-ADJUSTING BRACELET. — Wm. A. L. Miller, S. F. Dated May 27th. This is a novel construction for ladies' bracelets, and consists in a means of adjusting a single band bracelet without exposing the adjusting devices, and without any additional catches or attachments. This is effected by constructing the single band bracelet with a hollow slotted cap at one end, which is fitted to receive the opposite perforated or notched end of the band, and is provided with a means for securing the notched or perforated end at any point, so as to adjust the bracelet to any desired size.

DOOR KNOB.—D. & T. Morris, 1045 Market St., S. F. Dated June 3d. This invention relates to an improved means of securing and adjusting door knobs on the spindle which passes through the door and unites the knobs on opposite sides, and the improvements consist in the employment of a sleeve which is fitted to the spindle so as to slide easily upon it, this sleeve being connected with the knob and so constructed that it may be compressed or clamped upon the spindle so as to hold the knob at any desired point, and fit the shank upon each side of the door so that no washers will be needed to adjust the knobs to different thicknesses of doors. No screws or rivets extending into the spindles will be needed to attach the knobs.

ROLLER AND PULVERIZER.—Geo. Meding, S. F. Dated May 27th. This invention relates to that class of pulverizers or clod crushers which are rolled over the ground, and by that means break up the lumps and leave the soil in proper condition for sowing seed. The improvements consist in making the rollers of a series of four-sided bars placed so that the edges of said bars strike the ground and act more effectually on the lumps than a flat surface does. These bars may be removed at will or turned so that fresh edges are presented when the others are worn. The bars may be turned four times. The small lumps may pass through the interstices, and by being rolled over and over on the sharp edges inside the roller, are pulverized, and the dirt will then fall through on to the ground.

The Wilbraham Rotary Piston Pump.

This new pump, recently perfected by Wilbraham Bros., of Philadelphia, is a rotary piston pump, which, for simplicity of construction, efficiency of work and economy of operation, is said to be a very decided improvement upon any pump for ships' use hitherto perfected. The editor of the N. Y. *Nautical Gazette*, who has seen two sizes in operation, says, "that although working under disadvantages, yet their efficiency was demonstrated beyond question, and demands more than a passing notice of commendation. The moving parts are not subject to universal wear any more than an ordinary shaft, under average conditions. There is another pump at work which is of 6½ gallons capacity per revolution, which runs as required, at speeds varying from 50 to 175 revolutions per minute, and delivers more than its estimated capacity with perfect ease and noted economical use of steam."

The *Gazette* says further: "One of the features of this pump is that as to the openings in the pumps, and also the flanges, being of the same diameter the difference of suction and delivery is made by the pipes attached to the pumps. So that it is immaterial which is made the suction or delivery, as this pump works equally well either way; hence its value as a ship pump, especially in water ballast ships. These pumps are arranged to be driven either by belts, gearing, or engine attached to them direct."

"The Reading railroad steam collier, *Achilles*, is fitted with one of these pumps of 6½ gallons capacity per revolution. The pump of the *Achilles* is rated by the makers as a 6½-gallon pump, and it is connected with the water bottom through a 10-inch valve, and has an 8-inch outboard delivery pipe. The water bottom is 154 feet long, 36 feet wide at its top, and 3½ to the keel, and when full its water capacity is rated at 350 tons, although it is never completely filled. The pump is driven by a 9x9 vertical engine, and in port, the donkey boiler, carrying 40 pounds of steam, is used to discharge the water ballast; and with 25 inches depth of water under the engine room, this lowers the water 10 inches in 8 minutes, and has done even better than this. When the steamer is under way, the pump is used to circulate the water through the condenser, the steam being from 25 to 28 pounds pressure, furnished from the main boiler. These facts, we have obtained from Mr. John L. Howard, superintendent of the Reading R. R. Co. colliers, and can, of course, be relied on as authentic data.

"Mr. Howard, General Superintendent of the Reading Railroad Company's coal piers and collieries at Port Richmond, pronounces the Wilbraham rotary piston pump by far superior to any appliance of its kind he has ever tried, and he has tried almost every kind of pump in the fleet of 13 steamers, which he handles with remarkable skill and wonderful economy. Any appliance which is adapted for the use of these vessels must be of the highest standard of merit, as to capacity of action and economy of working. Hence we look upon his endorsement as satisfactory proof of its value." One of these pumps has lately been brought to this coast, and can be seen by those interested at the office of J. C. Senderling, 51 Fremont street.

PERSONAL.—Our well-known botanical contributor, Prof. J. G. Lemmon, has, we learn, turned his face toward the south en route for San Bernardino, in search for new plant treasures. Prof. Lemmon is one of our most enthusiastic and tireless investigators, and it is fair to presume that the world will know more of San Bernardino after his visit.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoograpbicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.

WEDNESDAY M., June 4, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3¼
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6¼@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, June 4, 3 P. M.

SILVER 85@50.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₩ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49¼@49½. Commercial, 50; Paris, five francs ₩ dollar; Mexican dollars, 89½@90½.

LONDON Consols, 97 1-16; Bonds (4%), 105.

QUICKSILVER in S. F., by the flask, ₩ lb, 36c.

W. BRUCKNER,

Mining Engineer,

Will Contract for the erection of

MILLS, ROASTING FURNACES, SMELTING FURNACES, AMALGAMATING WORKS,

— ALSO —

LEACHING WORKS,

With all the Latest Improvements. Address

STATE ASSAY OFFICE,

Safe Deposit Building, Room 16, San Francisco,

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, near Drytowa, Amador County, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the twenty first day of May, 1879, an assessment (No. 38) of Fifty Cents per share was levied upon the capital stock of the corporation, payable immediately in gold coin or legal currency of the United States, to the Secretary at the office of the Company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the first day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the eleventh day of August, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Trustees. W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal.

Rocky Point Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Placer County, Cal

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 1) levied on the 17th day of April, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
W B Douglass	96	23	$ 2 30
C J Pillsbury	34	2000	200 00
J C Rhoads	93	500	50 00
J C Rhoads	95	3000	300 00
J R Robbins, Trustee	12	500	50 00
J R Robbins, Trustee	15	500	50 00
J R Robbins, Trustee	17	63	6 80
J R Robbins, Trustee	21	1000	100 00
J R Robbins, Trustee	22	1000	100 00
J R Robbins, Trustee	62	1000	100 00
J R Robbins, Trustee	66	134	13 40
J R Robbins, Trustee	77	50	5 00
J R Robbins, Trustee	78	50	5 00
J R Robbins, Trustee	85	100	10 00
J R Robbins, Trustee	86	100	10 00
J R Robbins, Trustee	116	833	83 30
J R Robbins, Trustee	129	76	7 60
J K Cooper, Trustee	107	100	10 00
J K Cooper, Trustee	108	100	10 00
J G Whitney, Trustee	39	1000	100 00
J G Whitney, Trustee	42	500	50 00
J G Whitney, Trustee	43	55	5 50
L A Hinds	55	1000	balance 71 50
Ambrose Hinds	108	100	10 00
T L Bibbins, Trustee	98	100	10 00
T L Bibbins, Trustee	99	100	10 00
T L Bibbins, Trustee	101	100	10 00
T L Bibbins, Trustee	133	1000	100 00
T L Bibbins, Trustee	134	1000	100 00
T L Bibbins, Trustee	139	18	1 80
T L Bibbins, Trustee	145	800	80 00
T L Bibbins, Trustee	146	100	10 00
T L Bibbins, Trustee	147	50	5 00
T L Bibbins, Trustee	150	500	50 00
T L Bibbins, Trustee	153	30	3 00
T L Bibbins, Trustee	154	20	2 00
T L Bibbins, Trustee	157	100	10 00
T L Bibbins, Trustee	161	100	10 00
T L Bibbins, Trustee	162	100	10 00
T L Bibbins, Trustee	163	100	10 00
T L Bibbins, Trustee	170	500	50 00
T L Bibbins, Trustee	173	77	7 70
T L Bibbins, Trustee	175	100	10 00
T L Bibbins, Trustee	182	100	10 00
T L Bibbins, Trustee	188	50	5 00
T L Bibbins, Trustee	189	50	5 00
T L Bibbins, Trustee	191	500	50 00
T L Bibbins, Trustee	204	500	50 00
M J Rhoads	110	2400	240 00

And in accordance with law, and an order of the Board of Directors, made on the Seventeenth day of April, 1879, so many shares of each parcel of such stock as may necessary will be sold at public auction, in the City of San Francisco, at the office of the Company, on Monday, the Sixteenth day of June, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale. T. L. BIBBINS, Secretary.

Office, 314 Bush Street, San Francisco, Cal.

W. T. GARRATT'S

BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.

Hooker's Patent Celebrated

STEAM PUMP

☞ The Best and Most Durable in use. Also, a variety of other

PUMPS

For Mining and Farming Purposes.

ROOT'S BLAST BLOWERS,

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,

For Mining Purposes.

Garratt's Improved Journal Metal.

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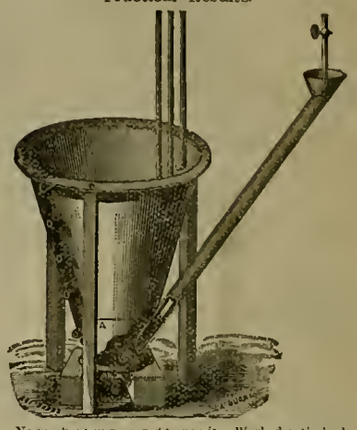

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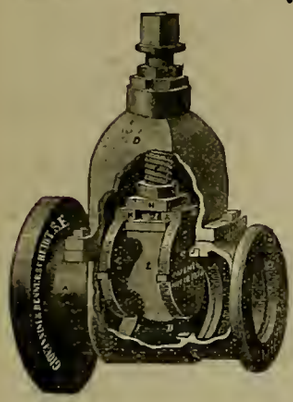

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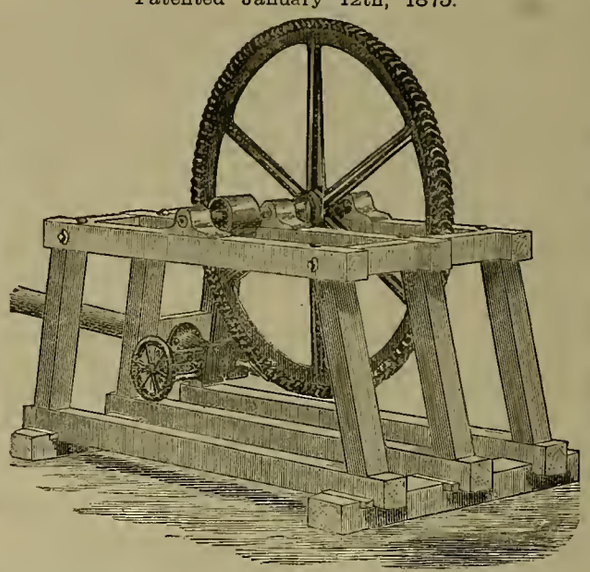

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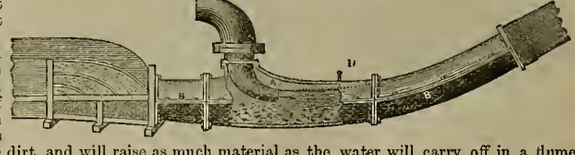
HYDRAULIC GRAVEL ELEVATORS,

For working flat gravel mines that have no dump.



Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

JOSHUA HENDY,

No. 51 Fremont Street, Office of the Hydraulic Gravel Elevating Mining Co., S. F.

A RARE BUSINESS CHANCE.

$250 will buy the Right for the whole Pacific Territories for the BUCKEYE CLOTHES-LINE FASTENER (just patented.) Large profits to manufacturer.
Address JOHN A. WORLEY, Cleveland, O.

AN ENGINEER,

Favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design Stationary, Marine, Locomotive, Mill Work, Sugar and Hydraulic Machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

LITTON SPRINGS PARK ASSOCIATION, OF SONOMA COUNTY, CALIFORNIA.

ANNOUNCEMENT EXTRAORDINARY!

A BEAUTIFUL HOMESTEAD IN THE COUNTRY THAT WILL PAY FOR ITSELF IN THREE YEARS!

2,600 Acres of Choice, Finely Wooded Land, to be Sub-divided into Farms of 20 and 100 Acres each, making

SIXTY FARMS, AVERAGING FORTY ACRES EACH.

Large Hotel, nine Cottages and other improvements, together with valuable Seltzer, Soda, Iron and Sulphur Springs, and 200 acres of land to be set aside and sold three years hence for the benefit of the shareholders. The improvements on this property have cost over $70,000.

Capital Stock, $150,000, divided into 60 shares of $2,500 each, payable $500 cash, and $500 in one, two, three and four years, in MONTHLY INSTALLMENTS. Half shares issued when two persons will combine to take one share.

The Subscription Book of the Stock of this Association will be open and ready for signatures on Monday, June 9th, 1879, at the office of the Association, No. 12 Montgomery St., S. F., near the Hibernia Bank. M. THEO. KEARNEY, Manager.

☞ Those wishing to visit the property can obtain tickets at half rates by applying to the Manager. HOTEL AND COTTAGES FOR RENT. The right man can rent the above property on very easy terms if applied for immediately.

IMPORTANT ANNOUNCEMENT.—On and after June 2d, 1879, passengers for Sonoma County can take the elegant and swift-going San Rafael steamers, and connect with the cars of the S. F. and North Pacific R. R. at San Quentin, thus greatly reducing the time, and bringing Litton Springs Park within less than three hours' ride of this city. Arrangements have also been made for reduced fare to such an extent that round trip tickets to Litton's can be purchased at our office for $3. Passengers can leave this city at about 7:10 A. M., spend four hours at the Springs, and return the same day. No more delightful trip can be found anywhere else in this State.

PLAN OF THE ENTERPRISE.—THE LITTON SPRINGS PARK ASSOCIATION has purchased for the sum of $150,000 the well-known Litton Springs property, which contains 2,600 acres of beautiful land, and includes most valuable seltzer, soda and iron springs, together with a fine hotel, nine cottages, large barn, school house, bottling house and other improvements—the improvements alone having cost over $70,000. These improvements having been made within four years, are almost as good as new, and in excellent condition.

TERMS.—The capital stock of this Association is fixed at $150,000, divided into 60 shares of $2,500 each, payable as follows: $500 at time of subscription, and $500 in one, two, three and four years, in monthly installments, with interest at the rate of 8% per annum on deferred payments. Those subscribers who desire to make advance payments of any portion of the amount due will be allowed a discount at the rate of 4% per annum, which, added to the interest of 8% they would be charged with on the deferred payments, would make 12% interest per annum they would get for their money.

The Association does not deem it advisable to divide this property into more than 60 shares, but if any would-be subscribers desire to take only half a share, and they will bring some friend who will subscribe for the other half share, then one-half shares will be issued to each.

In addition to the great natural beauty for which this property is so famous, it is designed to have the division lines of the various farms indicated by osage orange and other hedges, as is done to such great advantage in England and on the Continent. In addition to that, about FIFTEEN MILES OF AVENUES will be laid out through the property. These Avenues will be named Walnut, Almond, Olive, Cherry, Fig, Persimmon, Mulberry, Peach, Plum, Orange, Palm, etc., and it is the intention of the Association to plant trees on both sides of these Avenues of kinds corresponding with the names of the Avenues. Such an arangement will, in a few years, provide a series of drives so unique and charming that their equal cannot be found anywhere else in the United States, and will make the farms in this property so desirable as summer residences for the wealthy residents of San Francisco that the value of the farms may reasonably be expected to double several times. A VILLAGE SITE will be laid out near the hotel and springs, with lots 75 feet front by 150 feet deep, which will provide plenty of room for a cottage and garden around it, and a place in the rear for a stable at a considerable distance from the cottage. Lots will be reserved and donated for church, school, lecture-room and other public buildings. Special efforts will be made to induce college, seminary and other religious, educational and charitable associations to locate upon this property. Building lots have been set apart for co-operative fruit canning and drying establishments and for a co-operative winery. It is confidently expected that the beauty of the situation, healthfulness of the climate and accessibility from San Francisco and other portions of the State, and the proximity to the hotel and valuable mineral springs, will make this village the SARATOGA OF THE PACIFIC COAST.

The Association has secured 60 lots in this village, one of which will be donated, free of cost, to each subscriber to the stock of the Association. It is proposed to set apart the hotel, cottages, mineral springs, and about 200 acres of land as a separate parcel. The hotel and cottages are then to be rented to some good hotel man for the next three years, who will carry it on as a first-class health and summer resort, and secure for it the popularity to which its beauty and advantages entitle it. At the expiration of three years it is intended to place the hotel reservation of 200 acres, including the mineral springs and buildings, upon the market for sale for the benefit of the Association. It is confidently believed that the present great depression in real estate will have passed away by that time, and property be selling at much higher rates. In any event, the development of this enterprise will greatly enhance the value of this property, and the reservation should certainly sell for $150,000—considering the great value of the mineral springs, the value of the 200 acres of land, and the fact that the improvements have cost over $70,000. If the property does bring that price, then the shareholders will receive back $2,500 on each share, which is the full price of the shares, and will have their farms free and a village lot free, worth at least $1,000. Even if the property were sacrificed at public auction and sold for one-half of the above sum, $75,000, which is only the value of the improvements, then the shareholders would get back $1,250 on each share, they would have a village lot worth at least $1,000 (and perhaps $3,000 or $4,000), which would leave them their farms at a cost of only $250. It ought not to be forgotten that the surplus wood on the tract is worth, in the tree, at least $50,000, which would yield a dividend of $833 per share, and that when the time comes for a division of the property among the shareholders, the premiums that will be paid for choice of lots will amount to a very large sum, all of which will be distributed to the shareholders. There are numerous elegant sites for fine country residences on this property, commanding most charming views of the surrounding country and the Russian River Valley, and among the wealthy subscribers to the stock of this Association there will surely be an active competition for these choice spots. The thousands of dollars thus obtained will of course be divided among all the shareholders, and will inure greatly to the benefit of those who do not bid for choice.

Such an opportunity as this to buy a country home in the most beautiful portion of California, and on terms such as will in reality prove in a few years a free gift, has never before been presented to the people of this coast; and it is safe to assume that not for many years to come can a combination of circumstances again occur to produce such results.

There are only sixty shares in the association for sale, and the wise will lose no time in examining the property and preparing to subscribe. It is believed that all the shares will be subscribed for early, and that in 60 or 90 days, when the public generally understand and appreciate this opportunity, these shares will be in demand at large premiums. The stock of this Association will be transferable, like that of any other corporation stock.

Prospectus of the Litton Springs Park Association.

The magnificent Litton Springs property, situated four miles north of Healdsburg, on the line of the San Francisco and North Pacific Railroad, to be sub-divided into small farms and sold on the installment plan. The property consists of 2,600 acres of beautifully wooded land, part bottom land and part low, rolling hills, with a little high land. There are a number of very valuable mineral springs on this property, including the celebrated Litton Seltzer Spring, the water from which, for years past, has been bottled and sold on this market, and deservedly stands at the head of the seltzer waters of this coast. The soda spring is admitted by all to be the most wonderful and valuable mineral spring in this State; the water is strongly impregnated with iron, and its tonic and valuable medicinal properties are so great that if it were bottled and placed on the markets of the United States, it would certainly yield a very large yearly revenue. The volume of water from this spring is so large that it is carried in pipes to the hotel, and is used by the guests for bathing purposes, thereby furnishing so luxurious a bath as to fairly eclipse even those of the ancient Romans. There are many miles of feucing and cross-fencing on this property, completely inclosing it. The property being proof against live stock from the outside, rules can be adopted controlling stock inside so as to do away entirely with unsightly fencing, and substitute the planting of hedges for division lines, which will add greatly to the beauty of the landscape. The improvements on this property are very valuable, and comprise one hotel building, nine cottages, barn, school house, bottling house, farm house, etc. The main hotel building is 64 feet front by 164 feet deep, and three stories high. The entrance hall is 20x44 feet, the parlor 20x44 feet, the billiard room 20x44 feet, and the dining room 32x60 feet, and is capable of seating 150 people. The rooms on the first floor are 16 feet high; on the second floor 12 feet high, and on the third floor 11 feet high. There are 32 rooms on the second and third floors, besides bath and servants' rooms. A piazza 12 feet wide surrounds the building on three sides. Gas and water are supplied to every room, and all are furnished with stationary marble-top basins. There are nine one-story cottages near the hotel, of various tasteful and convenient designs. A two-story building on the property is used as a school house. A substantial and well-finished three-story barn furnishes accommodations for a large number of horses and carriages. In addition, there is a house at the Seltzer Spring used in bottling the water, and a farm-house and vineyard at a little distance from the hotel. These buildings have all been erected within a few years, of the best materials, in the most substantial manner, and with a high degree of finish. This property is bountifully supplied with pure spring water from the numerous springs in the hills, the waters of which are carried in pipes to the hotel and hotel grounds, and may be conducted all over the property for the supply of houses and fountains. Fine well water can be obtained almost anywhere on the tract at a short depth below the surface. Fuel in great abundance can be found on this property. In addition to the beautiful oaks with which nature has so lavishly adorned this estate, manzanita, spruce, pine, laurel and other trees in great abundance are growing upon portions of this tract. It has been estimated by men familiar with the subject that there are now growing upon these 2,600 acres of land at least 50,000 cords of wood, and making the very lowest estimate of its value, which is $1 per cord in the tree, the wood alone would yield $50,000—leaving an abundance of oak trees for beautifying the landscape.

CLIMATE.—Much has been said and written about the climate of Santa Barbara, Los Angeles and other points in Southern California; and large towns have been built and are flourishing upon the business which their reputation for salubrious climate has brought them. While in no way gainsaying or calling in question the claim made by the admirers of the southern portion of our favored State, it is nevertheless a fact, well-known to nearly all who have been on this coast for any length of time, that the climate of the Russian River Valley, in its delightful and health-giving qualities, stands without a rival, and when the lethargy which has enveloped the people of that section shall have been shaken off, and its advantages made known it will be sought for as a health resort by people from every country under the sun. With regard to the

PRODUCTIONS OF SONOMA COUNTY,

It may be said every variety of grain, vegetable, fruit and flower that has been profitably grown in any other portion of California has been grown successfully in Sonoma County. Unlike the central and southern portions of the State, irrigation is entirely unnecessary here. Crops have never been known to fail in Sonoma County. An erroneous idea prevails among a certain class that semi-tropical fruits can be grown only in the southern portion of the State, but the fact is now becoming generally known that oranges and other semi-tropical fruits have been grown in large quantities in many of the northern counties, and as far north as Shasta County. It is also well-known that the choicest and earliest fruits brought to this market are produced within a radius of 100 miles north of San Francisco.

THIS PROPERTY MUST BE SEEN TO BE APPRECIATED.

Arrangements have been consummated so that passengers for Sonoma County can take the elegant, swift-going San Rafael steamer and connect at San Quentin with the cars of the San Francisco and North Pacific Railroad, and reach Litton Springs in less than three hours from San Francisco. By this route passengers can leave this city at about 7:10 A. M., remain at Litton Springs about five hours and return the same day. Round-trip tickets to Litton Springs Park and return are for sale at our office at $3. The new arrangement goes into effect June 1st, 1879. A more delightful excursion than this cannot be found anywhere else in the State.

The law under which this Company is organized provides that married women may hold such shares as they acquire with their personal earnings, or those of their children, voluntarily bestowed therefor, or from property bequeathed or given them, independent of their husbands. Ladies are therefore particularly invited to call at this office and obtain further information concerning this enterprise. The title to the property is absolutely perfect, being U. S. Patent.

Parties in the interior desiring to subscribe for shares in this Association can do so by first sending to this office for a blank application, to be filled out by them. They will then send their application, together with $500 as a first payment upon each share of stock they may desire, through the agency of Wells, Fargo & Co.'s Express, and the stock will be delivered to the Express Company for them upon the payment of the money.

If any further proof of the character of this enterprise were needed, it is only necessary to refer to the following names of well-known gentlemen of this city, who are the original shareholders and officers of this company:

DAVID BIXLER, Esq., of Williams & Bixler, capitalist; F. G. NEWLANDS, Esq., of Lloyd & Newlands, Attorneys-at-Law; GEORGE HEARST, Esq., Capitalist; MESSRS. POOL & HARRIS, Warehousemen; COL. A. W. PRESTON, U. S. Army; PETER DONAHUE, Esq., President of the San Francisco and North Pacific Railroad; President of the San Francisco Gas Company; LOUIS B. PARROTT, Esq., of Parrott & Co., Merchants; JOHN A. PAXTON, Esq., of Paxton & Curtis, Bankers; JOHN ROSENFELD, Esq., Capitalist; GEO. W. PRESCOTT, Esq., of Prescott, Scott & Co., Fourdrymen; M. THEO. KEARNEY, Manager.

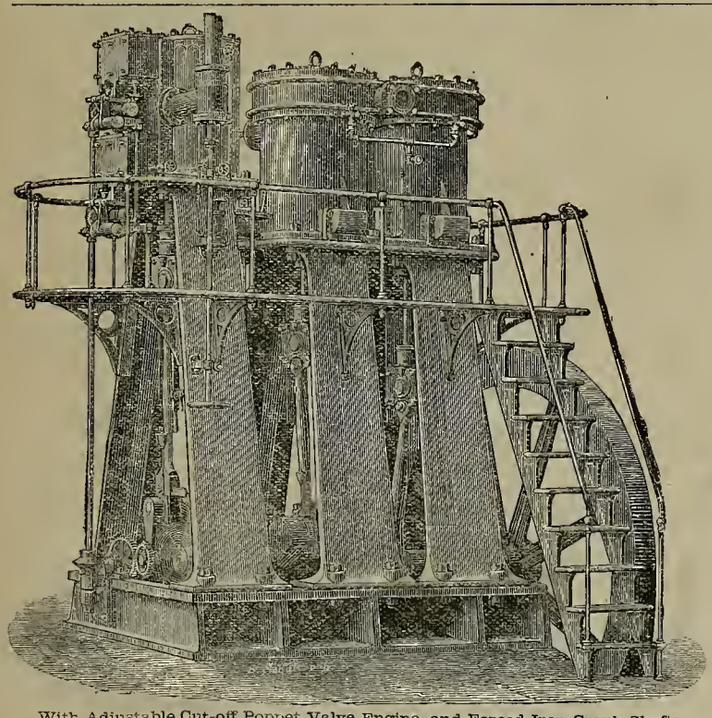
DIRECTORS.—PETER DONAHUE, F. G. NEWLANDS, JOHN A. PAXTON, COL. A. W. PRESTON, M. THEO. KEARNEY.

President—COL. A. W. PRESTON; Secretary and Manager, M. THEO. KEARNEY; Attorneys, MESSRS. LLOYD & NEWLANDS; Treasurer of Association, The Anglo-Californian Bank (Limited).

Office of Association—12 Montgomery St., S. F., near Hibernia Bank (up-staire.)

M. THEO. KEARNEY, Manager.

Beautiful lithographic maps and circulars of this property furnished, free of cost, to those who call or send for them.



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Mining Machinery Depot,

PARKE & LACY,

No. 417 Market Street, San Francisco.

NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

A CARD.

To Parties Interested in Mining and Milling.

Call at J. HENDY'S, N. E. corner of Mission and Fremont Streets, San Francisco, and examine COLEMAN'S PATENT SLUICE. It will save both float and flour Gold. The best system yet devised. No power required to work it. Examine it and judge for yourselves before purchasing elsewhere.

Engraving done at this office.

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This paper is printed with Ink furnished by Chas. Eneu Johneon & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y.

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CLAYTON STEAM PUMP WORKS
14 AND 16 WATER STREET, BROOKLYN, N. Y.

The Greatest Invention of the Age!

MACKINNON PEN.

THE NEW WRITING INSTRUMENT.

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PAUL'S AMERICANIZED ARASTRA.

This is a cheap, first-class Pulverizing and Amalgamating Machine, and one by which the miner is certain to make money. With a crusher, it makes the cheapest and best kind of a Prospecting Mill; to use in connection with Stamp Batteries it has no superior. Call and see it, or send for circulars to ALMARIN B. PAUL, Room 20, Safe Deposit Building, S. F.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JUNE 21, 1879. VOLUME XXXVIII Number 25.

Eaton's Improved Spoke Tenon Auger.

We illustrate herewith a device recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Robt. W. Eaton of Watsonville, Santa Cruz county. It is an improvement on that class of spoke tenoning machines which are intended to be clamped to the spoke, while the tenon is being made, and it consists in a novel construction of the cutter head, and in a means for adjusting and centering it upon the spoke. It also consists in novel means for adjusting the mandrel of the tenon auger, by means of swivel supporting rings, and operating screws, by which either end may be adjusted independent of the other, and any desired angle obtained.

As will be seen by the engraving a bar supports the boring augur, and is secured to the spoke, while the tenon is being formed. This bar is bent at right angles, as shown, and has a V-shaped groove formed in the enlarged face of this portion so as to clasp one side of the spoke. A stout loop or bail forms an arch from one side of the V-shaped groove to the other, and a block is fitted into this arch, so that a V-shaped groove in its face stands opposite the other V-shaped groove.

These screws to clasp the spoke, and a screw passing through the bail, may be turned to force the block inwards, and thus clasp the spoke securely in the double V-shaped groove formed between the two faces. The block is so mounted that it will adjust itself to the taper of the spoke when secured. Through the bar two screws pass at right angles with it and the spoke, and these screws have enlarged slotted ends into which the lugs or projections from two rings enter, and are screwed by a pin or pivot, so as to form a hinge joint, as shown. The rings serve to hold and guide the auger mandrel, and it will be seen, that by means of the adjusting screws one end of the mandrel or the other may be moved so as to give an independent adjustment to either end, and thus the mandrel may be set at any required distance from the bar, and also at an angle; as the hinge joints will allow of independent adjustments of the ends, a perfect aligment with the spoke is thus ensured.

The mandrel is hollow, and made in two parts, preferably of gas pipe, screwed together, and one part has a plug screwed or made fast into each end. Through one end a bar or rod passes, extending from the interior of one part through the plug, into the other part which supports the cutter head. A smaller rod or stem passes through the plug in the outer end of the mandrel, and has a neck or collar to prevent it from advancing.

It has a screw thread cut upon it within the mandrel, and screws into the rod so that by turning the head on the outer end, the rod may be advanced in either direction. By this means the gauge is formed, and the length of the tenon is determined and regulated.

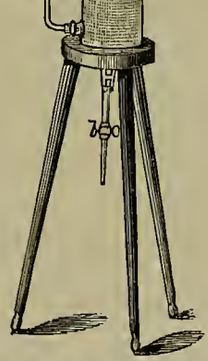
The tenon auger is secured to the end of the mandrel, and by means of the crank the mandrel and auger are turned, the auger cutting the tenon upon the spoke until the end of the bar strikes the end of the spoke and prevents cutting any further, as before described.

The auger or cutter head itself consists of two blocks fitted to slide in the guides so as to move to or from each other, as shown.

One of these blocks carries the knife which is secured to it by a set screw, and the face or portion of the block, which is opposite to the block, has one side beveled off, so as to make a sort of V-shaped projection. The other block has a V-shaped notch formed in its face opposing the block, so that the tenon entering between these two blocks has three points of support, namely, the surface of the block, formed by cutting off the incline, and the two sides of the V-shaped notch. As different sizes of tenon are cut, it will be seen that the points of support formed by the sides of the notch must be advanced more than the single face in order to keep the spoke and tenon in the center. This is effected by a peculiarly constructed right and left-handed feed screw.

This screw has one thread of a certain pitch working in the block, and the thread which feeds the block forward has a much more rapid pitch depending upon the angle of the groove or notch, so that this block is set forward faster than the other block, and this tenon will always be perfectly centered by this device, whatever may be its size. Set screws are turned up against the back, and support and steady the blocks, while a cut is being made.

This operation will thus be, to first prepare the spokes in the wheel in the usual manner, after which the machine is secured to each spoke successively. The cutter head being adjusted by setting the blocks at a suitable distance apart to form the desired size of tenon and the rod being set to gauge its length, it will only be necessary to turn the crank and rotate the cutter mandrel until the end of the rod comes in contact with the end of the spoke, when the tenon will be finished.



Eaton's Spoke Tenon Auger.

IMMODERATION IN EXERCISE.—This senseless "walking mania" cannot but be productive of harm to all who practice it. If generally adopted it will result in the development of some portion of the body to the detriment of some other. The physical and mental faculties must be equally exercised, or else nature's equilibrium will be destroyed, and the "human form divine" deformed. Let no person be persuaded that the "walking fever" is the inauguration of a proper system of exercise. It is simply a mountebank performance to gather the money of the morbidly curious; in other words it is an arrant humbug. If you have money to throw away, bestow it upon some deserving poor; if you need exercise, practice moderation and exercise all of the physical and mental capacities equally.

ATTENTION is being drawn by the Japanese emperor to the suicidal policy of exporting silkworm eggs for the purpose of providing the most formidable rival Japan can encounter, in the European markets with the means of producing a crop of silk in Italy one-third greater than Japan can raise under the most favorable circumstances.

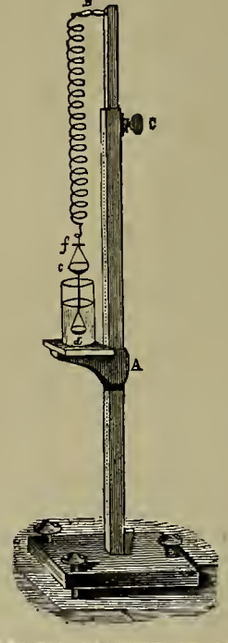
Specific Gravity of Minerals.

[Written for the MINING AND SCIENTIFIC PRESS by HENRY G. HANKS.]

The following apparatus is exceedingly convenient for taking the specific gravity of large specimens of minerals, rocks, coal, gold, quartz, etc., and is almost indispensable in the laboratory and assay office.

I found it figured and described in "Traite Elementarie de Mineralogy," by M. F. Pisani, a celebrated mineralogist, geologist and teacher, of Paris. As it will no doubt be interesting to many of your readers, I gladly furnish you with a drawing, and the following translation from the publication mentioned:

Fig. 2.



APPARATUS FOR DETERMINING THE SPECIFIC GRAVITY OF ORES.

"Fig. 1 is an apparatus very practical, which I employ to determine the density of large pieces, weighing from 100 to 500 grammes. A bell glass with a tubulure at the top and one at the side is reversed as shown in the figure, supported by a wooden tripod. To the latter tubulure is adapted a bent tube, and to the lower opening, a tube and stop-cock of glass, *B*, very well puttied—the tube is made to tapser at the lower end.

"To use the apparatus: Pour into the vase a certain quantity of water and determine by means of a movable band of paper, the level of the liquid in the tube, *A*. Open for a moment the stop-cock of the tube, *B*, in order to prove that the tubes are all clean and unstopped, and readjust the paper gauge.

"To determine the density of a mineral: First, weigh it on a common balance, and then plunge it into the vase, supported by a fine wire or thread, when the level is raised in the bell glass, the water is allowed to flow into a vessel, graduated into centimeter cubes, until the original level is attained in the tube, *A*. The volume found in the graduate gives the weight of the water displaced, and furnishes data for the calculation of the density."

It will be seen that this apparatus is simple, can be made of any size, and may be improvised in an emergency. I have fitted up the apparatus, and have it in daily use. I can recommend it as admirably adapted for the purpose intended.

If any of your readers desire to see it in operation, I will be pleased to show it to them if they will call at my laboratory, 619 Montgomery street. It is due to the mechanics of San Francisco to say that they can make any kind of apparatus required, if it is properly described to them, and it seems strangely unwise to send to Europe or elsewhere for what can be made so well at home.

The above described apparatus is not adapted for taking the specific gravity of small bodies. To determine the density of fragments which do not exceed five grammes in weight, "*Jolly's Spiral Balance*," Fig. 2, is admirably fitted. The same work quoted above gives an engraving of this apparatus (here reproduced), with the following description:

"This balance is very convenient to determine rapidly the density of minerals. Its great advantage is that no weights are used. The results are only approximative, but are sufficiently correct to distinguish one species from another.

"It consists of a square wooden stand, to one face of which is a strip of looking-glass, upon which is attached a scale, graduated into millimeters. The stem is provided with a base and leveling screws.

"Along the stem is a sliding platform, *A*, upon which a vessel of water is supported. In the glass is sunk a little cup of glass, *a*, supported by platinum wires, and above it a metallic pan, *c*, also supported by wires of platinum. At *f*, is fixed a triangle of cardboard, which acts as a pointer. The whole is suspended by a spiral of steel or brass wire, from a projecting support, *B*, which slides in a groove in the stem, allowing the spiral to be fixed at any convenient hight, and held in place by the set screw, *c*.

"To use this instrument—take the first reading by bringing the pointer and its image in the glass to the same level while the cup, *A*, is immersed in the water in the glass vessel—this is done by raising or lowering the platform. The reading on the scale may = 'X,' the mineral fragment is then placed in the pan, *C*, and the platform moved downward until the instrument is again at rest; and the position of the pointer again taken = 'Y,' Y − X = weight in air. The fragment is then changed to the cup, *A*, and the reading of the pointer again taken = 'Z.' Then Y − Z = loss of weight in water. Divide weight in air by loss of weight in water to obtain specific gravity.

NEW GRAVEL MINING PUMP.—We some time ago made mention of a gravel pump built for a mining company operating on the gold-bearing bars of a river in South America. Another of these pumps has just been built by Mr. William Deacon, of the Main Street Works, for the American Mining and Dredging Co., who owns the patent right. This centrifugal pump differs in many important respects from the ones previously made. It has a suction pipe 13 inches in diameter with a 46-inch runner, and is driven by two high pressure engines 10x12 at a speed of 250 revolutions per minute. The pump is being set on a boat which was launched a few weeks since on that part of the Feather river known as the Lava Beds, about five miles below Oroville. The boat is provided with the most improved appliances to handle and bring it into position wherever needed. The calculated power of the machine is about 2,000 tons of gravel raised from a depth of 20 feet below the level of the water every 24 hours. The machine was built after the plans of the inventor, Mr. E. Moreau of this city. The machinery is nearly all in place, and will shortly be put at work in the river bed as stated.

CHARLES S. SARGENT raises a warning voice in the *American Journal of Science* against the wanton destruction of pine forests in Nevada. He says the forests of Nevada, consisting of a few species adapted to struggle with the adverse conditions of soil and climate, are immense and reach maturity only after centuries of exceedingly slow growth. On this account, and because, if once destroyed, the want of moisture will forever prevent their restoration either naturally or by the hand of man, he urges action to prevent the destruction.

SEVERE shocks of earthquake occurred throughout Costa Rica on May 29th and 30th. The cathedral in San Jose was partially destroyed. Slight shocks of earthquake were felt on the Isthmus of Panama.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Beet Sugar in California.

EDITORS PRESS:—In a former communication I promised to give the readers of the PRESS a detailed statement why, so far, the beet sugar industry in California, the same as in the whole United States, has made no headway, in fact, has been a failure. I have visited every beet-sugar factory which has been in existence in California; I have conversed with many people who have been directly and indirectly interested in them, and have thus been able to form an opinion, which, I think, is pretty nearly correct.

I know, in giving this opinion to the public, I run the risk of stepping on some gentlemen's sensibilities, and will therefore apologize beforehand, being unavoidable in order to adhere strictly to the truth. But before I give a detailed description of these beet-sugar establishments I will here first of all state some fundamental points on which my judgment is based.

Any beet-sugar factory established in California, or in any other State of the Union, if the same had been erected in the same style, with the same machinery, in any country where the beet-sugar industry flourishes, and could not have existed there, it could not have been expected to turn out anything else than a failure here. Any man who would not be entrusted with the erection and construction of beet-sugar works in a country which offers every facility for establishing beet-sugar works, ought not to have been entrusted with it in a country where the beet-sugar industry is new and has to overcome many obstacles unknown in old sugar districts.

To establish beet-sugar works with reasonable certainty that they will pay, four things are indispensable. These are: Beets, money, fuel and water. Of each of these four it requires a liberal supply; if either of them is wanting or but scantily supplied, failure certainly will be the result. Besides a liberal supply of these four articles, all of which exist in great abundance in California, it requires men who understand the business and also the English language, and know the country well enough to avail themselves of the great many advantages which the United States offer to the beet-sugar industry.

The sugar factories, which so far have been the representatives of this industry in California have been: Alvarado, Soquel, Sacramento and Isleton. Neither of these factories started on a sound basis, neither had money enough, while the first had a supply of fuel which was worse than questionable. In 1871, the two first-named factories were started, the one in Alvarado, under the management of a German, on the centrifugal system, the one at Sacramento under the management of a French count. Alvarado started a little the earlier, and was estimated to cost $75,000, while Sacramento was to cost only $15,000. No sooner did it become known that the French count could (or, better, would) build a beet-sugar factory for so small a sum, displeasure and discontent were manifested by the others that they had entered into a contract requiring five times as much money. There is very little doubt, had a change to the "French" plan been still possible, it would have been made, but though that was impossible, the seed of discontent once sown grows as luxuriant as the beets, which is saying a great deal.

The Alvarado Sugar Works worked well the first year and cleared a profit of from $15,000 to $18,000, while the Sacramento factory failed to make any sugar at all. The French count taking French leave has never been heard from since. The authorities are conflicting as to the system on which this factory was to work, the probability is it had no system at all.

The success at the Alvarado works undoubtedly encouraged the Sacramento Beet Sugar Company, they engaged an expert beet-sugar manufacturer in Germany, and imported a lot of machinery to take a new departure in the diffusion system. The machinery was badly proportioned and worse arranged. The various changes made by the seven different technical managers made only a bad thing worse, the expert sugar manufacturers were turned out, and others took the place, who understood little of the business, to be turned out again to make place for worse ones still. The places as foremen, machinist, etc., etc., were sold by those who managed the finances, the whole undertaking from beginning to end was a combination of imbecility, dishonesty and folly, which would have ruined any other business, however, profitable and simple.

It can not be denied that the Central Pacific railroad made great efforts and sacrificed large sums of money to make the sugar works at Sacramento a success; but all in vain, the factory could not have worked successfully in Europe if it could have been transferred, and corruption was the order of the day from the president to the night watchman. The bank which had advanced money on a mortgage foreclosed the same and sold the machinery.

Although the factory at Alvarado worked with a profit the first year, the discord amongst the owners prevented it ever afterwards, and caused the breaking up of the works and the removal of the machinery to Soquel, where it has existed for five years longer. It is intended to work but a few months this year, and that for the last time, after which it will be removed again. During the last season (the factory worked from August till March) the sheriffs had possession of it, which does not tell well for profit; but these beet-sugar factories have a peculiar "inwardness," which is next to impossible for outsiders, who are not in the "ring," to understand. The same parties who placed the sugar works in the hands of the sheriffs, work it this year for their own joint account.

To complete this little sketch, it remains to refer to the beet-sugar works, at Isletou. This factory has been built on the diffusion principle, and the main part is constructed very well. The capacity of the works is, under the best circumstances, 30 tons of beets per day. The troubles of this company began before the machinery arrived, which was embargoed in New York. This factory, like the one at Sacramento, had a great number of technical managers in a wonderfully short time. Had the works been finished in proper time, and began sugar making when finished, the company could still have done well. The beets raised on the island where the factory is located are of a very rich quality, and the crops always large and safe. But when the factory at last did begin to work, it had been in operation but a short time when a flood came, swamping the harvested beets, the beet fields which had not yet been harvested, and with it the company. The sugar made at Isleton has been of a superior quality, the trouble lying in the finances and the peculiar organization. The factory does not work this year, but the company hopes to reorganize.

A small number of gentlemen have entered into the beet sugar industry from purely patriotic motives, knowing it would bring blessings to the country, and they have sacrificed large sums; but the most have tried to make money out of their friends, caring little whether they made sugar out of beets, the money under any circumstances had the sweetness to them, though it proved very bitter to others and to the industry at large. But I am sure nobody can contradict me when I assert that not one of all the parties who have been in the beet-sugar business, in California, had any perception what a well-appointed, complete beet-sugar factory costs in Europe, and what it would necessarily cost here, otherwise they would never have ventured with $15,000, or even $75,000.

The machinery once at Sacramento has been transferred to the buildings at Alvarado, and such changes are intended as are required to make it in all its appointments, a first-class beet-sugar factory of a European model. The factory is to begin sugar making by the first day of September, and the beet crop promises to be an extra large one—probably from 20,000 to 25,000 tons.

It is to be hoped that the company has learned wisdom from former failures, and will not commit the same follies over again. The unqualified success of the Standard Sugar Manufacturing Co. would give new life and a new start to this industry in California. But few people have a conception of the magnitude of this industry in Europe. The following figures which are official may surprise them:

On the 4th and 5th of May, this year, the associated beet-sugar manufacturers of Austria celebrated the 25th anniversary of the organization of their society. Twenty-five years ago the beet-sugar industry was trying to gain a sound footbold; to-day it is the giant of all the industries in the empire. The following figures will give a view of the magnitude this industry has assumed in 25 years: Two million of acres are annually cultivated in beets by the sugar manufacturers themselves, and fully as many more by farmers who sell their beets to the sugar works. One hundred and twenty thousand workmen are permanently employed in the sugar factories; a large number of them are skilled mechanics. The value of land was, 25 years ago, from 70 to 80 florins per acre; now it is from 300 to 350 florins. The sugar factories fatten annually 70,000 oxen on the pulp from the beets. The sugar factories transport over the railroads annually from 3,500,000 to 4,000,000 tons of freight, amongst which is 1,000,000 tons of coal, which they consume. The tax gatherer has easy work in the sugar districts, as they are paying taxes readily.

The 229 sugar factories in Austria have not only supplied the entire home consumption, but they have exported 2,000,000 centals of sugar, importing therefore 42,000,000 florins of gold and silver. The permanent investment in machinery and buildings in these 229 factories is over 100,000,000 florins, and as large a sum in agriculture and working capital. This, then, gives an investment for each sugar factory, for agriculture, working capital and machinery, of 860,000 florins, or, in round numbers, $400,000 or $200,000 for machinery and buildings. Where then are our notions of $15,000 to build a beet-sugar factory with at Sacramento?

The sugar industry, either from cane or beets, is at present the largest industry in the world, and yields larger and safer profits than any other; and a great reason for this is that it cannot be done with small sums of money or by anybody who understands nothing of it, and this is also the reason that the demand for gold and sugar has been, for the last ten years, greater than the supply, while every other industry has been languishing.

ERNEST TH. GENNERT.

Alvarado, Alameda Co., Cal.

The Mineral King Mines of Tulare Co.

EDITORS PRESS:—Now that work is about to begin in earnest and on a large scale in the Mineral King district of this county, your readers may be interested in a description of that promising mining region, which I have had the good fortune to obtain from an intelligent prospector and observer, who has been intimately acquainted with that part of the Sierras for six years past.

First, it should be known that our enterprising friend, Senator Tom Fowler, is having his new wagon road to that wild mountain district pushed to rapid completion. Ten miles of it are already finished, and work is progressing along the remaining miles, so that the latter part is likely to be finished before the Fourth of July. He has

A 30-Stamp Mill—

Formerly used in Nevada county—waiting at the Visalia R. R. depot, to be hauled to the mines as soon as the mountain road is done. This mill, designed to crush the ores of Fowler's Empire mine, is to be erected at Harry's Bend, a central point in the Mineral King district.

Now for the description of the geological features, and the metallic deposits of this region, which is doubtless destined to become famous among the many noted mining districts of the Pacific coast.

My informant is Mr. J. P. Ford, whom I had the pleasure to make a Granger at Plano on Tule river five years ago. He was one of the early discoverers of the Mineral King district. He now spends his summers there prospecting, and his winters in Hanford, carpentering. Since 1873 he has, according to common consent, thoroughly examined that whole mineral belt, which by his kind information I shall now describe.

The Extent of this Mineral Belt

Proper is about 12 miles long and 3 wide, its center being some 50 miles east and 15 miles north of Visalia. Its general course runs west of north and east of south—with the usual trend of our mountain ranges—at an angle of about 24°. There are not less than six true fissure veins in the district.

As regards its geological character, the leading formations consist of carbonates of lime, mica schist, or mica slate, gneiss, syenite and porphyritic rocks, including several strata of trap rocks. These porphyries and traps are the only signs of any later volcanic action in this mineral district. Mr. Ford has found no form of lava, no *scoriæ*, no pumice-stone, no lava. Yet almost in a straight line between this region and Mt. Whitney—some 18 miles northeast of the former and 12 southwest of the latter—he assures me there are large masses of obsidian or smoky quartz—whichever it will prove to be. Some boulders of it are from three to five feet long, and are occasionally so vitreous and transparent, that through pieces from six to eight inches thick you can see the hand moved to and fro, and even distinguish the finger-nails.

We have mentioned

Six True Fissure Veins.

Of these the White Chief, the Lady Franklin, and the Empire are the largest. The White Chief is on the extreme western boundary of the district. Its ores are sulphuret of lead (galena), and sulphuret of zinc (Black Jack of the miners), in combination with silver. The Lady Franklin and Empire veins are near the center of the mineral belt, along a west and east line. The Lady Franklin ore is sulphuret of lead, with silver and iron. The ores of the Empire mine are of an entirely different character, comprising carbonate of lead in small quantities, and ruby silver, with some base metals and gangue rocks. In the Black Wolf are found copper with sulphurets of iron and silver, copper being the chief element, amounting sometimes to 50%. Another vein, called the Chihuahua, is rich in silver and lead, and contains a large percentage of antimony. In this ore the sulphuret of lead sometimes amounts to 80%. A small vein, called the Crystal lode, is richer in lead and silver than any yet discovered.

Besides the above, there are many

Other Veins Appearing on the Surface

That have not yet been proved to be fissure veins. Among these, Amalgam Hill lode bears strong evidence of being a true fissure vein, and so does Mineral Hill lode.

Along the eastern boundary of this mineral belt, a large and well-defined lode of plumbago has been found during the last 18 months, and some specimens of it are found to contain as much as $64 of silver per ton.

With reference to amounts of ore, we may state, that, on the dump of one claim of the White Chief lode, at least 1,000 tons of ore can be seen; some say as much as 1,500 tons. Assays of this ore give as high as $300 per ton silver, and none less than $40. On the dump of Lady Franklin lode, from 300 to 500 tons of ore can be seen. Its average assay is $80 silver per ton, and some 22% lead.

A Number of Tunnels

Have already been run, as follows: In the White Chief there is one about 280 feet long, the ore not yet reached, and work at present suspended. In the John Franklin lode—probably a slide or surface lode—a tunnel has been made over 70 feet. The longest tunnel yet constructed is in the Empire lode. It is already about 480 feet long, and is being pushed ahead at the rate of more than three feet every 24 hours. On the Black Wolf, one tunnel has been run 80 feet and work stopped, but on another part of this lode, a second tunnel is being pushed ahead night and day by Samstage & Co., and is now in about 100 feet. There is an important tunnel, intended to crosscut several lodes, now in about 200 feet, and owned by the New England Tunnel and Smelting Company.

Improvements in this New Mining District

Are few as yet, but among them is a good sized and convenient public house, kept by E. S. Smith. Three years ago a saw-mill was put up near Harry's Bend. At least 100,000 feet of lumber have already been sawed and used.

Two years ago last fall, a water-jacket blast-furnace, with a Sturdevant blower, was erected by this New England Co. The general belief is that this machinery has not been properly handled to develop the real capacity of this mineral belt, and for reasons best known to said New England Co. They certainly failed to make bullion, but this failure is generally believed to have been intentional. What could have been their object? Apparently, to gobble up all floating stock, and thus to monopolize the property—"the old, old story" of joint stock companies in general.

Much interest is taken in the first work of the 30-stamp mill, which will soon be ready to work

The Empire Mine Ores.

The latter have yielded, in assays on which Mr. Fowler relies, an average of $121 per ton, silver. It may be well to state that several of the most rebellious ores of this district are now being tested by a new process. The result is watched with interest, and will be known in a few weeks it is hoped.

Before closing, it may be best to say about the geological formation of this district, that gneiss is found only on the west wall of the White Chief lode, and it forms the west wall of this mining district. This gneiss extends between a quarter and a half mile west, and is backed up by masses of granite. On the eastern side of this district, this massive granite also unites with the porphyritic rocks.

In several spots near the western limit of this mineral belt, some loose, large boulders, of gray and yellow rock like serpentine, are found. In one place near the eastern limit, considerable hornblende exists. It is also an interesting fact, that near the center of the district, there is

A Large Deposit of Magnetic Iron.

Which can be made useful, if combined with silica to form a flux for the absorption of sulphur from the numerous valuable ores.

Mr. Ford, from his intimate acquaintance with this mineral belt, is satisfied that in the next 10 years the mining property there will exceed the value of all other property in Tulare county, even if we rate unirrigated railroad lands at $20 to 40 per acre. He believes it will soon rival the Virginia City silver mines in their best days. People are only waiting for the completion of the new wagon road, and then we may look for an eager rush to the new mining region, like the old rush to Cariboo, to White Pine, to Virginia City, to the Black Hills, and to Leadville.

For the sake of this very promising part of California, both as regards our agricultural and mining interests, we earnestly hope the brightest of these anticipations will be realized.

Hanford, June 9th. J. W. A. W.

AZTEC RUINS.—A singular ruin stands on a little hill near the north bank of the Gila river, three and a half miles from the new railroad station at Gila Bend. Surrounding a space of two or more acres are stone walls, still standing to a hight of three or four feet, enclosing some twenty rooms and a peculiar structure which can readily be imagined to have been an altar. It is a perfect circle, within which lines of stones describe two equilateral triangles intersecting each other and forming a six-pointed star. At each point of the star, and in its hexagonal center are small circles of stones. Upon a rock near this structure is cut the figure of a man with outstretched arm pointing to the north. There is little doubt that excavation of the debris surrounding these ruins would disclose implements and other relics of a long forgotten race.—*Arizona Sentinel.*

RAILROAD GAUGES.—Two or three instances in which the gauge of roads has been changed from three feet to four feet eight and a half inches have been cited to prove the failure of the narrow gauge. What, then, is to be inferred from the fact that the Cherokee railroad in Georgia, which now has a gauge of five feet, is to be changed to the three feet gauge? We apprehend that because one gauge is suited to a certain locality, it does not follow that it is the only proper gauge for all the other roads in the world—or *vice versa.*

H. W. VOGEL has photographed the spectrum of pure oxygen, using for the purpose the gelatine bromide of silver plates prepared in England. These plates have only recently been introduced, and are said to be 15 times more sensitive than the most sensitive wet plates. The photographs will soon be published.

SOME 50 new species of fish have been discovered in our Atlantic waters during the year 1878, by the labors of the U. S. Fish Commission. A full description and classification of these important discoveries will appear in the publications of the U. S. National Museum.

MECHANICAL PROGRESS.

A Rapid Voyage.

The "fastest run on record" has just been accomplished by the English mail steamer *Durban*, Union Steam Company, Capt. A. S. Warleigh, with telegrams from the seat of war at the Cape. Leaving Table bay a little before 8 P. M., on April 1st, the steamer soon settled to her work, and before 11 on the following morning she had overhauled and passed the *Edinburgh Castle*, which had left the Cape Town docks fully three and one-half hours before her. Noon of this day disclosed the fact that she had run a distance of 221 miles during the previous 16 hours, or close upon 14 knots an hour. A light, favoring breeze springing up steadied the action of the screw, and the recording slate at noon of the following day conveyed the welcome intelligence that she had run a distance of 338 miles, or 14.1 knots an hour. The nine following days told almost the same tale, and at the close of the tenth a total of 3,231 miles was reached, giving an average speed of 323½ miles per diem, or 13½ miles an hour, a result never before attained by any of the steamers of this or the Donald Currie line, and not excelled, I believe, by the famous Cunard line, and this without the aid of any favoring breezes, which failed after the second day. Throughout the four following days she encountered a succession of head winds, head seas and opposing currents, but notwithstanding this the steamer kept up an average of 298 miles per diem, and Madsira was reached on the latter part of the 14th day. After remaining at that port for four and one-half hours, the steamer proceeded on her course across the dreaded Bay of Biscay to Plymouth, which she reached at 6 P. M. on Sunday, the 20th ult., thus performing the whole distance of about 6,000 miles in 18 days and 22 hours, inclusive of all stoppages, and actual steaming 18 days and 16 hours, or 13.1 knots the whole voyage. This result eclipses anything on record in steam navigation. Half the distance has been frequently done in less time by steamers of this lines to New York; but it must be borne in mind that it is a far easier task to run 3,000 miles in nine days than 6,000 miles in 18 days, as the *Durban* has done, coals having to be carried for this long distance, etc.

Steel Wire Belts.

From the *Gewerbe Zeitung* is taken the following account of steel wire belts, designed to take the place of leather belting: These driving belts are of the best crucible steel wire, in transverse network of one to two wires, in any desirable length and width. The two ends of the belt are joined like the middle, so that there is no beginning and no ending, the belt forming an endless band. These belts are not to be confounded with flat wire ropes, which, in consequence of the wires running parallel, longitudinally, are stiff and immovable. All the wires run parallel only across the width in such a manner that one wire catches into the other like a spiral, a continuous densely-woven chain being thus produced, the movability of which is so great as to enable it to go round the smallest pulley. The straps are also made with leather or elastic lining, or bordered with leather, elastic, hemp, hair taps, or any other material, also its interstices filled with gutta-percha, to prevent their stretching. When large and broad belts are employed, the lining of leather or other material may be omitted. The journal quoted makes very positive assertions of the advantages of these belts, claiming that they are in every way superior to all flexible transmitters of motion heretofore employed.

BENDING TIMBER.—The usual process of bending hard wood, especially beech, by means of hot water or steam, is known to be somewhat costly as regards fuel, and moreover requires a long time. But an invention has recently been brought forward in Germany, it appears, for making sieve hoops and similar objects by a dry process, more cheaply and in less time, from simple cut wood. Two rollers are employed in the operation, one above the other, and having less velocity, so that the upper acts by holding back, while the lower extends the wood fibers. When the board, thus bent, leaves the rollers, it is fastened in the mouth of the sieve; the upper roller is fluted, the under one smooth. If two smooth rollers were used, a very much greater pressure would, of course, be required.—*American Builder.*

AMERICA'S FIFTEEN INVENTIONS.—An English journal frankly gives credit to American genius for at least 15 inventions and discoveries which, it says, have been adopted all over the world. These triumphs of American genius are thus enumerated: First, the cotton gin; second, the planing machine; third, the grass mower and grain reaper; fourth, the rotary printing press; fifth, navigation by steam; sixth, hot air or caloric engine; seventh, the sewing machine; eighth, the India rubber industry; ninth, the machine for manufacture of horse shoes; tenth, the sand blast for carving; eleventh, the gauge lathe; twelfth, the grain elevator; thirteenth, artificial ice manufacture on a large scale; fourteenth, the electro-magnet and its practical application; fifteenth, the composing machine for printers.

New Buoys.

The immense oceanic traffic, with its attendant dangers, and frequent terrible loss of life, has brought much inventive labor to bear on the construction of signals and buoys. The means hitherto used to warn ships on the approach of dangerous places, may be divided into two classes, namely, such as can be seen, and such as can be heard. Lately improvements in both these directions have been made in application to buoys. A Belgian engineer, Pintsch, has constructed a buoy the body of which serves as a reservoir for 300 cubic feet compressed illuminating gas, and from this a self-regulating lamp attached above this buoy is supplied. The supply lasts for three months, and the light is visible to a distance of six or eight miles. The cost in England was found to be three to six pence in 24 hours. This undoubted merits of this invention have led to the conviction that these buoys are capable of displacing the expensive lightships, for it has been amply shown that the light is not extinguished in the most severe storm, and that aside from the quarter-yearly filling with gas, they require no other attention whatever.

Mr. J. M. Courtenay, in the invention of the buoy bearing his name, assumed that no light, not even the most powerful electric, could penetrate a dense fog; he therefore provided his buoy with an automatic alarm signal. Projecting downward from the air chamber of the buoy is a long tube, open at the bottom, and closed at the top by an arrangement of valves. The rising and falling of the column of water in the tube performs the function of an air pump, the exit of the compressed air being through a locomotive whistle of 10 inch diameter. The signal can be heard two to four miles. The lighthouse board of our government intends to introduce an ingenious combination of the above mentioned systems of buoys, thereby making the advantages of such subserve to increased maritime safety. We understand the new buoy is to be used on the Pacific coast.

NEW RAILROAD TIE.—At the regular monthly meeting of the Engineer's Club of Philadelphia, a model of an iron railroad tie, which is being tried on the Philadelphia & Baltimore Central railroad, was exhibited. The device dispenses with all spikes, bolts, nuts, or fish plates, and drilling or punching the rails, avoiding fractures from such causes. The iron tie, it is claimed, will outlast 12 renewals of the ordinary tie at one-half the cost to keep in repair. Each tie is recessed under its rails, and along the bottom of the recess wedge-shaped pieces are cast transversely. At the sides of each recess are creosoted blocks, which form a cushion and a fulcrum for two clamps, which grasp the flange and web of the rail above, bearing upon opposite faces of the wedge below. The weight of the train forces the clamps upon the wedge, spreads them at the bottom and grips the rail. The first cost is somewhat greater than the wooden tie, but it is said to offset this in durability.

DELICACY OF THE MINT SCALES.—New Orleans *Times:* The fine gold-weighing scales made in Philadelphia for the New Orleans mint, and placed in position recently, are marvels of mechanical invention and accurate workmanship. The larger of the two has a capacity of 10,000 ounces Troy, or about 686 pounds avoirdupois, and, when loaded to its full weight, will indicate a variation of one thousandth part of an ounce, or the millionth part of its weighing capacity. Another pair of scales is the one intended for weighing gold only. It has bearings composed of the finest agates, which have been ground with wonderful precision. So delicate is this machine that it will give the precise weight of a human hair, and is susceptible to the slightest atmospheric changes. Millions of dollars worth of precious metals will be weighed annually upon these scales.

TIDE-WATER PIPE LINE.—This line is now completed from Coryville, Pa., on the McKean & Buffalo road, to Williamsport, about 100 miles, and the first oil was pumped into it May 28th. It is designed to be an independent line, and will deliver its oil at Williamsport to the Philadelphia & Reading road. It is of six-inch pipe and has an estimated capacity of 6,000 barrels a day. There are two pumping stations, one at Coryville and one at a point 22¾ miles east. The line has been an expensive one to build, passing over a rough and hilly country, to and through which the transportation of the pipe was costly and troublesome.—*Railroad Gazette.*

THE MICROPHONE IN MINE DISASTERS.—The buried miners at Sugar Notch tried very hard, by pounding on the walls and doors of their rocky prison, to let their friends outside know they were alive, but did not succeed. The question is raised whether the long and distressing uncertainty as to their fate might not have been relieved had a microphone been employed. Also whether it would not be possible to devise and make known to all workers underground a simple code of microphonic signals, to be communicated by rapping and heard by means of the microphone, whereby some sort of intercourse might be kept up between those without and those within a mine under such circumstances.

PNEUMATIC TUBES.—A system of pneumatic tubes took the place of telegraph lines in Paris on May 1st, for the transmission of messages from one part of the city to another. The charge is 50 centimes, or 10 cents, for open, and 75 centimes for sealed messages.

SCIENTIFIC PROGRESS.

Scientific Incredulity.

In the recent achievements of mechanical and scientific processes, the mind naturally reverts to that period of time when successful experiments existed in an embryotic, ideal condition. Then, the suggestion, merely, of ideas that have fructified into all the elements of society, so necessary to its comfort at the present day, was the suggestion of impossibilities. Science had then arrived, as was generally believed, at the limit line, beyond which was the unknown, the impossible. In spite of the perfect stats at which purely speculative philosophy had arrived, the mind absolutely refused to combine with matter, the intangible with the tangible, and yet, physically speaking, the latter was the all-important. It was forgotten that all things were possible, and that portion of the cerebrum, which should have contained the knowledge of the distinction between essences and prototypes, was a void, waiting for genius to fill it with possibilities *ex nihilo*.

What a storm was raised about the theory of spontaneous generation, yet the scientific language of Darwin was clear enough. He laid down no more than Ponchet had actually demonstrated with his microscope years before, to wit: That certain organized beings have no known progenitor. There was no denial of the Creator, merely a misunderstanding of terms. It is a fact that railroad trains at full speed travel around sharp curves in perfect safety, and yet no less a man than Stephenson disputed it, and demonstrated it to be impossible. The uses of steam, of electricity, of all of the now practically useful contrivances, have at some period received a backhanded blow from scientific incredulity, yet the world moves. We deny that there is any limit to scientific possibilities. Of course we do not fail to distinguish between a change of essence, as a square circle, and the realization of an ideal prototype. And in the light of all present developments there is not surely room for derison in the direction of any theoretical mechanical or scientific ideas.

Had the *vox populi* prevailed, we would now have been groping our way in blissful ignorance of the wonderful, nay mysterious elements, practically applied in every department of our affairs. We must advance, for we have gone too far to retrace our steps even if we would. Those who caviled then, still live to cavil now, and with a pyrotechnic display of printer's ink, decry this and that from a standpoint of pure invincible ignorance or deep-seated jealousy. Whether Kesly's or Gray's motors become of any practical benefit or not, they are well worth the trial. If they should succeed, cavilers will applaud; if they fail, "I told you so," will be the epitaph scientific, or rather unscientific, incredulity will place upon the grave of labor and research for man's physical welfare.

How often is the germ of an idea, fecund with future mechanical or scientific possibilities, hoen crushed in its inception by the jeers of the skeptic. A monomaniacal, visionary scheme, true, but a man of one idea is generally the successful man; a monomaniac, but with method in his madness. All schemes remaining locked up within the recesses of the mind are essentially visionary, but their practical development dispels the odious signification unjustly attached to the word. Varied accomplishments are brilliant like the rocket, but end in a poor stick after all, unlike the still, persistent glow worm, to which may be likened the unobstrusive visions of the inventor having one idea. Let the incipient inventor be encouraged, and let his scheme and plane be assisted at least by a negative assent, and not derided, lest we destroy the future of some scientific wonder. *Cui bono* the spectroscope? A child's toy, to please its fancy with imitation rainbows; its value in the arts has removed all incredulity. *Cui bono* spontaneous generation? It led a Salisbury to the cryptogamic theory of malarial diseases and their cause and cure, and will yet lead to the destruction of the dread diphtheritic bacterium. Truly scientific incredulity is a fact!

SCIENCE AS A DETECTIVE.—An emery wheel, guaranteed to stand 600 revolutions, was run at the speed of 1,000 revolutions, and burst, doing a large amount of damage. A suit to recover was instituted, based on a letter written by the seller of the wheel, in which the strength of the wheel was rated at 1,600 revolutions. While in the office of the prosecutor endeavoring to effect a settlement, the defendant observed that a certain make of ink was used, and he learned by a casual inquiry that the same ink was used exclusively by the prosecutor. The defendant had for several years used another ink. Taking samples of the two inks to a chemist, he was able after analysis to secure a solvent for the one which would not affect the other. The case came to trial. Evidence was taken as to the kind of ink each party employed. Then the chemist was called, and in the presence of the jury applied the solvent, which removed the interpolated "1," and left the rest of the writing untouched. The proof of the forgery was sufficient, and the case was dismissed, leaving the dishonest prosecutor to defend himself from a criminal charge.—*Scientific American.*

Another New Metal.

The services the spectroscope is capable of rendering to science become more and more evident daily, the latest proof of the fact being the discovery of a new metal called scandium. In some of the mines in Sweden and Norway small quantities of earthy minerals are found, called gadolinite and euxenite, composed of oxides of very rare metals. The bulk of the substance is of a rose color, arising from the presence of erbium, and is called erbine. At first it was supposed to be simply mixed with some earthy substances which rendered it impure, but not long ago M. Marignac discovered the presence of another metallic substance, which he called ytterbine, the oxide of ytterbium. However, great uncertainty existed as to the composition of these bodies, and M. Nilson undertook a series of experiments on the subject. M. Berthelot, at the last meeting of the Academy of Sciences, gave an account of what had been done so far, the result being the discovery of a new metal to which M. Nilson has given the name of scandium, to indicate that it is of Scandinavian origin. Erbine is, as before mentioned, of a brilliant rose color, while ytterbine is white. But the separation of the two substances can only be effected with extreme difficulty. The earth has to be dissolved in boiling nitric acid, and the ytterbine then precipitated by sulphuric acid; and M. Nilson found that the operation, repeated more than 20 times, did not completely separate the two bodies.

When he had obtained a comparatively pure ytterbine he commenced an examination of it, and then he found that it gave absorption bands in the spectrum unknown to any substance previously examined. After repeated trials he became convinced that he was dealing with a metal never before suspected, and he continued his researches. He is unable to say at present what may be the chemical properties of this new body, as the quantity of material at his disposal was insufficient to allow him to isolate the metal. Nor can he decide as yet as to the place this new metal is to take among the older ones, but he considers that its properties differ materially from those of erbium and ytterbium, and that it should rank between tin and thorium, as the atomic weights of these two are 118 and 234, while he calculates that of scandium at from 160 to 180.—*Scientific American.*

HEMACITE.—The progress in the utilization of waste products is manifested in a striking manner by the manufacture of a peculiar substance from the blood of beeves, called hemacite. Although much incredulity has been expressed concerning its utility, it appears to be successfully established that an article of fine appearance and utility can be made of blood, either as an entirety or after the elimination of its albumen. After continued experiments, it was discovered that by mixing this blood with certain pulverized mineral and vegetable substances, singly or in combination, and the resulting mass triturated to a fine powder, and then subjected to a powerful mechanical treatment, it could be formed into a great variety of useful articles. Scraps of paper, leather or cloth were used in place of this pulverized substances mentioned, with the same result. For different colors, however, the mineral or vegetable powder must be used in combination. Many goods are now in market made of hemacite, which were formerly made of vulcanized rubber. The Dibble Manufacturing Co., at Trenton, N. J., having been compelled to provide specific machinery, is now in full operation and doing a large business.

CHLORIDE OF MAGNESIA IN GAS METERS.—Owing to the difficulty and expense of obtaining a good dry meter wet meters are still largely in use, and the question of what shall the liquid be is an important one. Water is, perhaps, the worst possible filling; it freezes in winter and evaporates in summer. Alcohol is free from the former disadvantage; but not from the latter. Glycerine, the use of which was first proposed by Prof. H. Wurtz, is better than either. A solution of chloride of magnesium has also been tried and found to be excellent, when the gas is free from ammonia, which is, unfortunately seldom the case, as the white spots on our argand chimneys tell us. Goebel has tried chloride of magnesium, and found that when there is only 0.3 gramme of ammonia in 100 cubic meters of gas serious results follow in a few months. A part of the salt is decomposed, forming sal ammoniac, which combines with a second portion of the former to form a double salt, magnesia being precipitated as white powder on the clockwork and wheels. The double salt subsequently decomposes, liberating hydrochloric acid. Chloride of magnesia is most effective in purifying gas from ammonia.—*Scientific American.*

VANILLA FROM OATS.—From oats a substance is obtained having the odor of vanilla, by subjecting the husks to an extractive process similar to that used for obtaining the glucose from chiccory blossoms. The substance thus obtained is odorless, but when its aqueous solution is subjected to an oxidizing process, it is transformed into a material having the odor of vanilla, which can be separated from the water by the use of ether, and further purified.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending May 29.		Week Ending June 5.		Week Ending June 11		Week Ending June 19	
Alpha	23¾	21¼	29½	22¾	32¼	28¾	29½	23
Alta	8¾	7¾	10	8¾	11¼	9¾	10	8¾
Andes	50c	40c	1.35	50c	1¼	80c	1.15	65c
Alps	....	....	....	....	....	....	....	....
Argenta	1½	90c	1.15	1	1¼	1	1.15	1
Atlantic	....	....	25c	....	45	35c	50c	....
Aurora Tunnel	30c	20c	....	....	....	....	40c	....
Baltimore Con	....	....	1.35	1	1.30	1	1.30	50c
Belcher	6¾	5¼	6¼	5¾	7¾	5¼	6¾	6¼
Belmont	45c	40c	75c	55c	75c	65c	65c	60c
Best & Belcher	20¾	17¾	22	18¾	21	19	19	17¼
Bullion	7½	6¾	8¾	7½	11¾	9¼	8¾	7¾
Bechtel	2.70	1.60	2.40	1.90	2	1.70	2	1¾
Belle Isle	1	65c	1.40	1	1.40	1.15	1.55	1.35
Bodie	43	21¼	41	36¼	45	41	46¼	38¼
Benton	5¼	4.55	7¾	6	8¾	7¼	7	6
Bulwer	13½	11	14¼	11½	12¼	11¾	12	10
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2¾	1.60	2¾	2	3	2	2¼	2
Belvidere	2¾	90c	2½	1½	2.10	1.55	2.10	1¾
Booker	1	30c	1.05	75c	1.10	70c	1	90c
Caledonia	3	2¼	3.30	2¾	4¾	2.65	3.15	2.60
California	7	5¾	7	6¼	7¾	6¼	6¾	5¾
Challenge	3	2¾	3½	2	3.40	3	3	2.85
Chollar	9	6¾	9¾	7¾	9	8¼	8¾	7¾
Confidence	16	13¾	18¾	15	16¾	15	15¼	14½
Con Imperial	1.70	1.45	2	1.65	2.35	1.90	2.20	1.70
Con Virginia	7	5¾	6¾	6¼	7	6¾	6½	5
Crown Point	8	5	6½	5¼	6¾	5¾	6	5¾
Con Washoe	....	....	....	....	30c	....	40c	....
Champion	45c	25c	45c	35c	50c	25c	70c	50c
Concordia	....	....	30c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	10c	....	10c	5c	10c	5c
Dancy	....	....	....	....	....	....	....	....
Day	60c	50c	1½	50c	45c	30c	45c	40c
Eureka Con	18	17	18¾	17¾	17	15¼	17	15¼
Exchequer	8¼	7½	9¾	8	12	9¾	9¾	7¾
Endowment	25c	....	40c	30c	35c	25c	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.40	3.10	4½	3.45	4	3.60	4.20	4
Gila	20c	15c	75c	15c	75c	65c	80c	75c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	15	13	14	13	14	12	14	....
Goodshaw	80c	50c	80c	65c	75c	50c	80c	70c
Gould & Curry	12¾	9¾	13	11¼	13¼	11¾	12¼	11¼
Hale & Norcross	18	14½	18¼	15¼	18	17	17	15¼
Hillside	2	1.90	2¾	2	2.95	1.90	2	1.90
Highbridge	....	....	35c	30c	35c	25c	60c	25c
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	15c	10c	10c	5c	10c	5c
Independence	3	2.80	3.90	3	3¾	5	3.10	2.90
Julia	4¾	3.70	4¾	4.30	5¼	4½	4.80	4.30
Justice	3¾	3.30	4.85	3.80	4¾	4.30	4.10	3¾
Jackson	6	5¼	6	5½	5½	....	6	5¾
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6½	4¼	6	5¼	5¾	5	5¼	5
Kossuth	....	....	....	....	....	....	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	80c	65c	2	70c	1.45	1¼	1.35	1.20
Lady Wash	1.40	1¼	1.95	1.60	3	2	2.40	1.90
Leopard	1	....	1	65c	80c	65c	1	....
Leviathan	75c	70c	80c	55c	75c	70c	75c	70c
Leeds	80c	70c	75c	....	1	50c	1	70c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	50c	....	50c	30c	40c	25c
Modoc	....	....	1½	10c	1½	1	1¼	1
Manhattan	2.40	2¼	2.35	2¼	2¾	2¼	3	2½
Martin White	6¾	....	6¼	....	6¾	6	6¾	6¼
McClinton	1.80	1	1½	1¼	1¾	1.20	1.65	1¼
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	43	40	45½	42	45	39	39¼	33
Mides	....	....	....	....	1½	....	....	....
Morning Star	....	....	3	....	3	....	....	....
North Con Virginia	10¾	10	11	9	9¼	8¾	9	8
New York	65c	60c	1	65c	1½	90c	1.15	80c
Northern Belle	6¾	6	7	6¾	6¾	6¼	6¾	5
New Coso	....	....	....	....	....	....	25c	....
Navajo	25c	15c	50c	25c	45c	35c	50c	45c
Occidental	....	....	60c	50c	1	85c	1	75c
Ophir	40	37	39¼	37¼	36¾	32½	34½	32
Oriental	95c	60c	65c	....	75c	70c	75c	50c
Overman	11¾	8¾	12	10½	12½	10¾	13	11¼
Panther	....	....	....	....	....	....	....	....
Phenix	3¼	....	3	2¼	2½	....	3½	3
Phil Sheridan	1	25c	1	75c	90c	50c	90c	60c
Potosi	5½	4.60	6¼	5½	7	5¾	6½	5¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4¾	3	6¼	4¼	5	4½	4¾	4¼
Richer	....	....	80c	....	65c	60c	75c	55c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17	12½	17½	15	16¾	15½	16	14¾
Seg Belcher	....	....	....	....	28	25	28	24
Sierra Nevada	54	47	56¾	51½	56	48	48	43
Silver Hill	2½	2	3	2¼	3	2.40	2½	2
Silver King	....	....	8	7	....	....	8	....
Silver Prize	50c	....	50c	40c	....	....	....	....
Succor	90c	25c	1	80c	90c	70c	80c	50c
Summit	3	1¾	2¾	2	2¼	2	2½	2¼
Scorpion	3.85	2¾	3¾	3	3.40	2.10	2.90	2¼
Solid Silver	15c	5c	20	10	20c	10c	45c	10c
South Bodie	50c	35c	65c	40c	45c	40c	45c	40c
South Standard	....	....	25c	20c	50c	20c	35c	25c
Star	50c	35c	60c	25c	40c	35c	40c	25c
St. Louis	....	....	....	....	50c	....	....	....
Syndicate	4½	3¾	4½	3.45	5	3½	5½	4.90
Tioga Con	4	2.20	3.90	3¼	4	3	3.95	3¾
Tiptop	80c	70c	90c	75c	1¾	95c	1½	1¼
Trojan	35c	25c	40c	25c	35c	30c	35c	25c
Union Con	90	80	97	87	99	75½	79	63
Utah	32	18¾	31	24	28	23	23	21½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.30	1.10	1½	1¼	2	1¼	1¾	1½
Wells-Fargo	....	....	30c	25c	40c	25c	25c	20c
Woodville	25c	....	50c	25c	40c	30c	40c	30c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	21¾	17½	21½	20	21¼	20¼	20	16½

Sales at S. F. Stock Exchange.

Friday A. M., June 13.

1575 Atlantic...50c
1045 Andes...1@1.05
800 Alta...9¾@10
145 Alpha...26@27
1675 Bullion...8¼@8¾
400 Best & Belcher...18
1030 Belcher...6¾@6½
740 Baltimore Con...1.30@1
1050 Benton...7@6¾
1235 Caledonia...3@3.15
85 Confidence...15¼@15½
3630 Con Imperial...2.15@2.20
265 California...6¾@6½
745 Crown Point...5¾@5¾
595 Con Virginia...6½@6¼
135 Chollar...8@7¾
500 Con Washoe...40c
250 Challenge...3@2.90
1290 C Dorado...2½@2.60
1520 Exchequer...9¼@9¾
230 Flowery...80@85c
700 Fairfax...1½
755 Gould & Curry...11¼@11¾
625 Hale & Nor...15¾@15½
560 Justice...4@4.05
775 Julia...4¾@4.60
220 Kentuck...5@5¼
1160 Lady Bryan...1.30
1105 Lady Wash...2¼
1150 Leviathan...70@75c
665 Mexican...36¼@37¾
585 Mackey...2@2.05
100 Maryland...50c
100 Mount View...2.40
110 North Con Vir...8¾@9
1595 New York...1.15@1¼
920 N Bonanza...2¼@2.15
110 Occidental...75c
535 Ophir...33½@33
550 Overman...12@11¾
300 Phil Sheridan...90c@1
550 Potosi...5¼@5
200 Plutus...1¾
10 Seg Belcher...28
360 Savage...14¾@15½
530 Succor...80@75c
630 Sierra Nevada...46@46½
340 Scorpion...2.90
320 Silver Hill...2.40@2½
200 Solid Silver...15@10c
300 Trojan...30@35c
495 Utah...23@22
515 Union Con...76@78
1270 Ward...1¾@1.55
100 Wells-Fargo...25c
495 Yellow Jacket...18¾@19½

AFTERNOON SESSION.

700 Adenda...75@70c
815 Argenta...1.10@1.15
750 Booker...1
150 Black Hawk...2½@2.45
500 Belvidere...2@2.05
135 Bulwer...11¾@12
280 Bodie...46@46¼
400 Bechtel...2@1.90
2025 Belle Isle...1.35@1.45
650 Belmont...60@65c
1550 Champion...60@70c
100 Caledonia (B H)...4½
550 C Pacific...8¾@8¼
300 Chieftain...10c
200 DeFrees...5c
100 D Standard...75c
515 Dudley...1.35@1¼
150 Defiance...1.40@1.35
550 Day...40c
150 Eureka Con...16@15¼
910 Glynn Dale...1
1110 Golden Terra...14
1275 Goodshaw...80@70c
105 Grand Prize...4¼
2580 Gila...70@75c
1190 Hussey...10@5c
1055 Hamburg...50c
940 Highbridge...30@25c
740 Independence...3@3.10
110 Jackson...6
1620 Jupiter...1.90@1.80
200 Leeds...70c@1
50 Martin White...6½
550 Mammoth...13@13¼
700 Mono...11¾
250 May Belle...30@25c
230 Modoc...1¼
430 McClinton...1.30@1.35
400 Manhattan...2¼@2¾
320 Northern Belle...6½@6¾
300 New Coso...25c
680 Noonday...3¼@3.30
1700 Navajo...50@45c
2000 N Noonday...1
350 Orient...20c
100 Phenix...3½
50 Paradise...1.70
800 Queen Bee...60@80c
100 Richer...75c
300 Raymond & Ely...4½
70 Real del Monte...2
200 Red Cloud...60@70c
25 Silver King...8
690 Summit...2.45@2½
800 S Bulwer...1¼@1.30
1100 S Standard...30c
175 S Bodie...45@40c
810 Syndicate...5@4.90
100 Star...25c
500 Tuscarora...10c
1005 Tioga Con...3¾@3.85
650 Tiptop...1.30@1¼
250 University...75c
200 Vortex...95c
850 W Pacific...50c
200 Wales...2¼@2¼

Saturday A.M., June 14.

210 Alpha...29¼@29
310 Alta...9¾@10
1095 Andes...90c@1
1800 Atlantic...50c
100 Albion...25c
30 Adenda...65c
50 Argenta...1.05
90 Best & Belcher...19@18¾
890 Bullion...8¼@8¾
1250 Belcher...6¾@6½
400 Baltimore Con...1¼
550 Benton...7
400 Belle Isle...1½
795 Bodie...40@38½
360 Bechtel...1.85@1.80
105 Bulwer...11¾@11½
250 Belvidere...2@2.05
380 Black Hawk...2.30@2¼
150 Booker...90c@1
685 California...6¼@6½
855 Con Virginia...6@5⅞
1584 Con Imperial...2.20@2.15
350 Crown Point...5¾@5¾
240 Chollar...8¼@8¼
420 Caledonia...3@3.15
290 Challenge...3@2.95
1050 Con Dorado...2.45@2½
675 Champion...65@60c
410 C Pacific...8@8½
500 D Standard...50c
1600 Day...40c
500 Dudley...1.30
1045 Exchequer...8¾@8½
700 Fairfax...1½@1.40
350 Flowery...85@80c
440 Gould & Curry...12¾@12¾
200 Gila...80c
115 Grand Prize...4¼
910 Goodshaw...75@70c
200 Glen Dale...1
190 Golden Terra...14
310 H & Norcross...16¾@17
200 Hussey...10@5c
200 Hillside...1.90@2
490 Independence...3
305 Julia...4¾@4.80
445 Justice...4.10@4.05
400 Jupiter...1.80@1¾
25 Jackson...6
50 Kentuck...5½
200 L Bryan...1.30@1.35
515 L Wash...2.30@2½
30 Leviathan...75c
420 Mexican...39@39¼
500 Mackey...2
150 Mountain View...2½@2.40
260 Manhattan...3
680 McClinton...1¾@1.30
350 Mono...10@10½
80 Mammoth...14½
50 M White...6¾
1150 New York...1.10@95c
600 N Con Virginia...8¾@9
890 N Bonanza...2¼@2.30
140 Northern Belle...6¼@5
200 New Coso...25c
160 Ophir...34¾@34½
175 Overman...12¼
370 Occidental...1
1010 Potosi...6¼@6¼
220 Phil Sheridan...90c
350 Plutus...2
50 Paradise...1.70
100 Phenix...3
450 Queen Bee...75@80c
100 Red Cloud...65@70c
30 Real del Monte...2
185 Savage...15¾@16
495 Sierra Nevada...48¼@48
1150 Succor...75@80c
20 Seg Belcher...24
320 Silver Hill...2.30@2.40
240 Scorpion...2.60@2.90
300 Solid Silver...35c
410 Summit...2¼@2¼
150 Syndicate...5
390 South Bodie...45c
350 S Standard...30@35c
400 Trojan...35c
510 Tioga...3¾@3.85
190 Tiptop...1.30@1.45
375 Union Con...79@76
135 Utah...22¾@23
600 University...65@70c
300 Vortex...90c
815 Ward...1¾@1.70
500 Wells-Fargo...25c
50 Wales...2¼
7455 W Pacific...50c
180 Yellow Jacket...20¾@20
830 Union Con...74@73
670 Ward...1.60@1.55
200 Woodville...30c
50 Wells-Fargo...25c
160 Yellow Jacket...19¼

AFTERNOON SESSION.

760 Argenta...1.10@1
300 Albion...30c
950 Adenda...65@70c
265 Booker...95c@1
450 Black Hawk...2.10@2
290 Belvidere...2.10@2
40 Bulwer...11½@11¼
210 Bodie...41@41¼
2195 Belle Isle...1.50@1¼
535 Bechtel...1¾@1.90
1625 Champion...65c
320 Caledonia (B H)...4
25 C Pacific...8¾
250 Day...45@40c
100 DeFrees...5c
100 D Standard...50c
640 Dudley...1¼@1.40
50 Defiance...1.35
50 Eureka Con...15¼
650 Fourth July...75c
180 Glynn Dale...95c@1
800 Goodshaw...70c
330 Grand Prize...4¼@4.20
1425 Gila...85c
200 Highbridge...30c
400 Hussey...5c
150 Hamburg...50c
285 Hillside...2
1200 Independence...2.90@2.80
1100 Jupiter...1.90@2
100 Leeds...70c
100 M White...6½
1365 Manhattan...3
150 Mammoth...15@14¾
75 Mono...10½
100 May Belle...40c
665 McClinton...1½@1.60
100 Modoc...1
280 Noonday...4
1400 Navajo...50@45c
125 Northern Belle...6¾@6¾
1100 N Noonday...1¼@1½
100 Orient...20c
1000 Oriental...60@50c
250 Paradise...1¾
550 Queen Bee...60@65c
100 Real del Monte...2
30 Raymond & Ely...4¾
350 S Bulwer...1.30@1.20
250 South Standard...25c
435 Syndicate...5
225 S Bodie...45@40c
210 Summit...2.40
110 Tioga Con...3.90@3.85
80 Tiptop...1¾@1.40
600 Tuscarora...15@10c
800 University...65@60c
2900 Vortex...65@75c
1785 W Pacific...50c

Monday A. M., June 16.

175 Alpha...28@27
90 Alta...9¼@9
100 Atlantic...50c
420 Andes...1@1.15
40 Best & Belcher...19@18¾
1500 Bullion...7¾@8¾
560 Belcher...6½@6¾
430 Benton...6½@6¾
370 Baltimore Con...1¼
85 Confidence...15¼@15
1500 Con Imperial...2.05@2.15
630 Crown Point...5¾@5¾
590 Chollar...8¼@7¾
305 California...5¾
1050 C Dorado...2¾@2.30
1175 Con Virginia...5¾@5¼
100 Challenge...3@2.90
240 Caledonia...3.10@3
1795 Exchequer...8¼@8
100 Fairfax...1½
115 Flowery...85c
955 Gould & Curry...11¾@12¼
480 Hale & Nor...16¾@16½
430 Julia...4.70@4.65
170 Justice...3.90@3¾
60 Kentuck...5¼
200 Lady Wash...2¼
800 Leviathan...75@70c
1355 Lady Bryan...1.20@1.35
790 Mexican...36@36¼
300 Margarita...25c
250 Mackey...2@2.05
200 Mountain View...2½@2.40
505 N Bonanza...2.15
50 North Con Vir...8
675 New York...80c@1
295 Overman...12@12½
780 Ophir...33@33½
100 Occidental...1
570 Potosi...5¾@5¾
275 Phil Sheridan...90@80c
250 Plutus...2¼
255 Silver Hill...2.30@2½
120 Savage...15¼
50 Scorpion...2½
300 Senator...25c
545 Sierra Nevada...45
700 Succor...70@65c
100 Trojan...35c
345 Utah...22@21½

Tuesday A. M., June 17.

335 Alpha...24@23
470 Alta...9@9½
410 Andes...1@1.05
100 Baltimore Con...50c
1000 Bullion...7¾@7½
705 Benton...6¾@6½
850 Belcher...6½@6¾
295 Best & Belcher...17¼@17¾
480 California...5¼
4695 Con Imperial...1.70@1.80
485 Caledonia...3.15@3¼
965 Crown Point...5¾@5¾
300 Challenge...2.85@2.95
300 Con Washoe...40c
600 Con Dorado...2.10@2
2090 Con Virginia...5¼@5¾
130 Chollar...7¾
200 Cosmopolitan...55c
85 Confidence...15@15¼
1325 Exchequer...7¾@7½
300 Fairfax...1¾
210 Flowery...85@80c
480 Gould & Curry...11¾@11½
75 H & Norcross...16¾@16¾
260 Julia...4½@4.45
70 Justice...3.80@3¾
180 Kentuck...5
1180 L Bryan...1.30@1¼
825 Leviathan...70@75c
200 Lady Wash...2.40
770 Mexican...35¾@35
150 Maryland...50@60c
245 Mackey...2
200 Mt View...2.40@2½
1590 N Bonanza...2@2.10
270 North Con Vir...8
440 New York...90@85c
90 Occidental...80c
295 Ophir...32¾@32¾
160 Overman...12½@13
150 Plutus...2
100 Potosi...5¼
80 Phil Sheridan...65c
340 Savage...15¾@16
460 Succor...70@65c
585 Sierra Nevada...43@45½
460 Scorpion...2½
415 Silver Hill...2¼@2
290 Solid Silver...45c
300 Trojan...30@35c
20 Utah...22
1125 Union Con...70@66
600 Ward...1½
460 Yellow Jacket...19

AFTERNOON SESSION.

1210 Argenta...1@1.05
850 Addenda...55c
110 Aurora T...40c
115 Bodie...43½
825 Bechtel...1.85@2
1250 Booker...1@90c
1025 Belle Isle...1.55@1½
340 Belvidere...2@1¾
415 Black Hawk...2¼@2.15
100 Crœsus...10c
400 C Pacific...8¼@8
1025 Champion...60@65c
120 Caledonia (B H)...4¼@4½
850 Day...40c
1315 Dudley...1.45@1½
450 D Standard...50c
115 Eureka Con...15½@16
500 Fourth of July...75c
550 Gila...80@75c
240 Grand Prize...4@4.10
670 Goodshaw...70@75c
200 Glynn Dale...1
400 Hussey...5c
50 Hamburg...60c
100 Independence...2.90
10 Jackson...6
710 Jupiter...1.90@1.95
120 Leopard...1
100 Leeds...75c
250 May Belle...30@35c
990 McClinton...1½@1.45
350 Mono...11½@11
50 Martin White...6½
100 Mammoth...14¾
410 Manhattan...2.90@2.60
310 Northern Belle...6¼@6
490 Navajo...45c
675 Noonday...4½
1900 N Noonday...2¾
1200 Orient...20c
1560 Oriental...70@65c
100 Paradise...1¾
650 Queen Bee...50c
30 Raymond & Ely...4¾
100 Real del Monte...2
400 S Standard...30c
10 Syndicate...5
500 S Bodie...45@40c
790 S Bulwer...1.10@1.15
200 Star...40c
125 Tioga...3.90
550 University...65@60c
360 Vortex...60c
250 W Pacific...50@45c

Wed'sday A.M., June 18.

220 Andes...95c@1
4400 Atlantic...50c
200 Alta...9¼@9¼
165 Alpha...25½@25¾
430 Belcher...6¾@6¾
395 Baltimore Con...50c
370 B & Belcher...18¾@18
1960 Bullion...8¼@8¾
940 Benton...6¼@6
840 California...5¼@5¾
120 Challenge...3
855 Caledonia...3@3.10
1855 Con Virginia...5¼@5¾
350 Chollar...8¼@8¾
410 Crown Point...5¾@6
2295 Con Imperial...1.90@1.95
20 Confidence...15
320 Con Dorado...2
1230 Exchequer...8¾@8¼
900 Fairfax...1½@1¾
700 Flowery...80@85c
450 Gould & Curry...12@12¼
345 Hale & Nor...16¾@17
120 Justice...3.90
550 Julia...4½@4.60
75 Kentuck...5¼
200 Kossuth...20@15c
140 Lady Wash...2.40@2.30
720 Lady Bryan...1.35@1¼
500 Leviathan...70@75c
1325 Mexican...34¼@34¾
430 Maryland...50@60c
230 Mackey...2.10@1.90
55 North Con Vir...8¼
250 N Sierra Nevada...10c
1150 N Bonanza...2.10@2
1210 New York...99c@1
420 Ophir...33¾@34¼
105 Overman...12½@12¾
300 Plutus...2¼
460 Potosi...6¼@5
450 Phil Sheridan...60@65c
725 Sierra Nevada...45@46
375 Savage...16@15¾
75 Silver Hill...2.30@2.20
325 Solid Silver...45@40c
300 Succor...60@50c
420 S Utah...30c
160 Scorpion...2¼@2.40
1400 Union...65@67¾
305 Utah...23@23¼
400 Wells-Fargo...25c
200 Woodville...40c
600 Ward...1½@1 60
630 Yellow Jacket...19@19¼

AFTERNOON SESSION.

605 Argenta...1
200 Albion...40c
1200 Addenda...60@50c
1500 Belle Isle...1.55@1.60
175 Bodie...44
215 Bulwer...10½@10
170 Bechtel...1.90@1.85
970 Black Hawk...2½
300 Belvidere...1¼
840 Booker...90c@1
700 Champion...55@60c
140 Con Pacific...8@8½
750 Caledonia (B H)...5
200 DeFrees...5@10c
750 Day...40c
1920 Dudley...1.45@1½
100 D Standard...50c
355 Eureka Con...16½@17
250 Fourth July...70c
200 Gila...75c
210 Grand Prize...3.70@3¾
570 Goodshaw...70@75c
450 Glynn Dale...95c
60 Golden Terra...14
650 Hamburg...60@55c
300 Highbridge...60c
330 Independence...2.90@2.95
20 Jackson...5¾
600 Jupiter...1.80@1.90
650 Leopard...1
100 Leeds...90@75c
200 Manhattan...2½
550 McClinton...1.65@1½
425 May Belle...40@35c
215 Mono...10½
30 Mammoth...14½
410 Martin White...6½@6¾
250 Northern Belle...6@6½
600 Navajo...45@50c
85 Noonday...4¾
1210 N Noonday...2½
1000 Orient...20@25c
900 Oriental...70@75c
50 Phenix...3
750 Queen Bee...45@50c
95 Raymond & Ely...4½
50 Richer...55c
50 Star...35c
400 Summit...2.40@2¼
1540 Syndicate...5@5½
850 S Bodie...45c
400 South Standard...25@30c
1275 S Bulwer...1
150 Tuscarora...15c
855 Tioga Con...3.95@3.85
255 Tiptop...1.40@1½
400 University...65@70c
600 Vortex...60c
200 W Pacific...40c

720 N Bonanza...2.10@2.15
1220 Ophir...32¾@34¼
410 Overman...12@12½
75 Occidental...1@85c
100 Phil Sheridan...75c
515 Potosi...6¾@6¾
100 Plutus...1½
265 Savage...16@15¾
25 Succor...80c
95 Seg Belcher...28
540 Sierra Nevada...49½@48
615 Silver Hill...2½@2.40
150 S Potosi...60c
1025 Scorpion...3@2.95
875 Solid Silver...15@20c
100 St Louis...50c
65 Utah...24
1135 Union Con...80@75½
50 Woodville...35c
2540 Ward...1¾@2
570 Yellow Jacket...20¾@20½

AFTERNOON SESSION.

400 Albion...20@25c
2000 Addenda...76c@70c
750 Argenta...1.05@1.15
1370 Booker...1@90c
445 Black Hawk...2¼
575 Belvidere...2@2.05
20 Bulwer...11¼
480 Bodie...44¼@44
1170 Bechtel...2@1.80
2530 Belle Isle...1.30@1.35
50 Belmont...70c
680 Champion...45@55c
310 Caledonia (B H)...4¾@4¼
360 C Pacific...8¾@8¼
225 Day...40c
200 Double Standard...50c
2950 Dudley...1.30@1¼
500 DeFrees...10c
150 Defiance...1½
90 Eureka Con...15½
800 Fourth July...85@80c
1070 Goodshaw...75c
1030 Gila...80@75c
600 Glen Dale...1
800 Hamburg...50c
1000 Highbridge...25c
100 Hillside...1¾
100 Hussey...10@5c
675 Independence...3¼@3.10
200 Jackson...6
1315 Jupiter...1¾@1.90
550 May Belle...30c
90 Mammoth...11½
1815 McClinton...1.40@1.20
150 M White...6½
85 Mono...11¾@12
270 Manhattan...2½@2.40
820 Noonday...3¼@3.20
640 N Noonday...1.10@1
150 Navajo...40@35c
100 Northern Belle...6½@6¾
400 Orient...20c
100 Paradise...1.95
125 Queen Bee...60@55c
10 Real del Monte...2
10 Raymond & Ely...5
250 Red Cloud...75c
140 Syndicate...4¾@5
100 Star...40c
715 Summit...2.30@2.20
490 S Bulwer...1.45@1.35
600 S Standard...25@30c
1150 S Bodie...45@40c
450 Silver King...6
1300 Tiptop...1.35@1.10
830 Tioga Con...3.95@3.85
1100 University...75@60c
700 Vortex...90c@1

500 Savage...15¾@15¾
450 Succor...60c
915 Sierra Nevada...44
165 Silver Hill...2¼@2
1365 Scorpion...2¼@2¾
550 S Utah...35@30c
475 Solid Silver...45@40c
550 Trojan...30@35c
770 Union Con...65@63
165 Utah...22
1080 Ward...1.65@1½
1200 Wells-Fargo...25@20c
100 Woodville...40c
80 Yellow Jacket...18½

AFTERNOON SESSION.

1000 Argenta...1@1.05
100 Albion...35c
1390 Addenda...50c
590 Black Hawk...2¼@2¼
545 Bodie...42¼@42
1250 Bechtel...1¾@1.85
1860 Booker...90c@1
300 Belle Isle...1.70@1.65
185 Bulwer...9½@10
75 Belvidere...1¾@1.85
480 Champion...50@45c
500 Crœsus...5c
300 C Pacific...8
500 Chieftain...10c
285 Caledonia (BH)...4¼@4½
200 Day...35@40c
1785 Dudley...1.45@1½
700 D Standard...50c
950 DeFrees...5c
80 Eureka Con...17@17½
125 Giant & O A...2½@2
250 Glynn Dale...90@80c
800 Goodshaw...70c
50 Grand Prize...3.10
1040 Gila...80@85c
100 Hussey...5c
200 Hamburg...60c
100 Hillside...2
900 Independence...2¾@2.80
50 Jackson...5¾
495 Jupiter...1.90@1.95
100 Leeds...75c
85 Leopard...1@1.05
140 Manhattan...2.60
215 Martin White...6¾@7
480 Mammoth...13@13½
655 McClinton...1.40@1¼
270 Mono...10
525 May Belle...40c
150 New Coso...25@20c
35 Northern Belle...6
520 Noonday...4¾
975 N Noonday...2¼
2350 Navajo...50c
1530 Oriental...75c
1300 Orient...30@25c
100 Paradise...1.90
350 Phenix...3
1150 Queen Bee...45@50c
220 Raymond & Ely...4½
250 Star...40@35c
200 S Bodie...45c
450 S Standard...25c
620 Summit...2.40@2½
430 Syndicate...6@8
50 Silver King...8
1750 S Bulwer...95c@1.05
40 Tiptop...1.20
100 Tuscarora...15c
1525 Tioga Con...3¾@4
800 University...65c
450 Vortex...60c
250 W Pacific...40c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Booker Con G M Co	California	2	25	Apr 28	June 2	June 23	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	2	25	Apr 26	May 30	June 21	W A M Van Bokkeleu	419 Cal st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Gila S M Co	Nevada	4	20	Apr 30	June 3	June 23	Wm W Parrish	328 Montgomery st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
N Comstock S M Co	Nevada	1	05	May 30	July 2	July 23	D L Thomas	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
Trojan M Co	Nevada	10	25	Apr 9	June 2	June 23	David Wilder	328 Montgomery st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery st
Trojan M Co	Nevada	10	25	April 9	June 2	June 23	David Wilder	328 Montgomery st
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
America M Co	Nevada	1	25	May 9	June 11	June 28	R B Noyes	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 1	Jno Crockett	203 Bush st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Pine st
Black Hawk G M Co	California	5	25	Apr 28	June 5	June 28	H A Charles	419 California st
Champion M Co	California	3	15	Apr 15	June 6	July 7	Jno Crockett	203 Bush st
Emigrant S M Co	California	4	50	May 10	June 10	June 30	B W Mudge	309 Montgomery st
Florence Blue Grav M Co	California	4	05	Apr 18	May 22	June 25	F A McGee	Merchants' Ex
Jupiter M Co	California	3	20	Apr 24	May 26	June 25	E C Masten	309 Montgomery st
Mayflower S M Co	Nevada	1	05	Apr 1	June 6	June 30	J W Pew	310 Pine st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
North Bonanza M Co	Nevada	2	50	Apr 30	June 4	June 29	W W Stetson	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Occidental Con Grav M Co	California	1	07	May 19	June 23	July 12	W T Smith	402 Montgomery st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Seg Europa M Co	Nevada	1	25	Apr 4	June 27	July 14	R B Noyes	240 Montgomery st
Selby Hill M Co	California	2	15	May 8	June 9	June 26	H Aug Whiting	211 Sansome st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Sophia G M Co	California	1	02½	Apr 23	June 5	June 23	L L Blood	Merchants' Ex
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Eagle S M & M Co	Nevada	J E Dixon	20 S F Stock Ex	Annual	July 7
N Con Virginia	Nevada	G C Pratt	25 Nevada block	Special	June 27

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., June 12.

125 Alpha...30½
365 Alta...9½@9¾
955 Andes...1.05@1.20
100 Atlantic...45c
185 Best & Belcher...19¾
1000 Bullion...9¾@9¾
1305 Belcher...7¾@7¾
900 Baltimore Con...1.20@1.30
125 Benton...7½
210 Challenge...3@3.10
725 California...6½@6¼
3920 Con Imperial...2.40@2.35
875 Chollar...9
640 Con Virginia...6¼@6¾
1050 Crown Point...6¾@6¼
490 Confidence...15¾@16
1180 Caledonia...3¾@3.35
500 C Dorado...2¾
100 Cosmopolitan...50c
200 Con Washoe...30c
845 Exchequer...10@9¾
100 Erie...55c
430 Flowery...85@90c
300 Fairfax...1@1.10
175 Gould & Curry...13@12¾
500 Green...1½
200 Geo Douglas...55c
180 Hale & Nor...17¼@17¾
685 Justice...4.40@4¼
490 Julia...6@5¼
370 Kentuck...5¾@5¾
750 Leviathan...75@60c
1125 Lady Wash...2½
550 L Bryan...1.45@1.40
975 Mexican...40@39
1180 Mackey...2.15@2¼
200 Mt View...2.40
300 Mides...1½
450 Maryland...50@45c
750 New York...1¼@1.20
135 N Con Vir...8¾@8¾
500 North Sierra Nev...15c

Thursd'y A.M., June 19.

230 Alta...8¾@8½
130 Alpha...25½
200 Atlantic...50c
735 Andes...70@65c
110 Best & Belcher...17¾
1485 Belcher...6¼@6¼
1175 Bullion...6¾@8½
1140 Benton...6½@6
280 Crown Point...5¼@5¾
525 California...5¾@5¼
30 Chollar...8⅝
925 Con Virginia...5¼@5
2755 Con Imperial...1.85@1.90
3,0 Caledonia...2.80@2.60
100 Confidence...14½@14¾
40 Challenge...2.90
300 Con Washoe...40c
580 Con Dorado...2.10
100 C P Ravine...25c
1125 Exchequer...8@7¾
10 Flowery...75c
350 Gould & Curry...11¾@12
320 Hale & Nor...16¾@16¾
295 Julia...4.30@4.40
355 Justice...3¾@3.80
220 Kentuck...5
225 Kossuth...20c
2650 Lady Bryan...1.35@1¼
700 Leviathan...75c
250 Lady Wash...2.20@1.90
880 Mexican...33½@33
280 Maryland...50c
400 Mt View...2½@2.40
1250 New York...1
65 North Con Vir...8¼@8¼
495 N Bonanza...2.05@2
440 Ophir...32½@32
170 Overman...12@11¼
200 Occidental...1
25 Phil Sheridan...60c
395 Potosi...6
280 Plutus...2¼

Pacific Board—Latest Sales.

Wed'sday A.M., June 18.

10 Alpha...26½
90 Alta...9¾@9½
620 Belcher...6¾@6.75
20 Benton...6¾
360 Bullion...8¼@8½
150 Best & Belcher...18¼@18
285 California...5½
200 Chollar...8¼@8¾
150 Caledonia...3.05@2.95
50 Con Virginia...5¼
580 Con Imperial...1.85@1.90
230 Crown Point...5¾
335 Exchequer...8@6¼
450 Gould & Curry...12¾@12¼
30 Hale & Nor...16¾
290 Justice...3.90
50 Julia...4 45
50 Kentuck...5¼@5¼
210 Mexican...34¼@34¾
155 Ophir...34@33¾
90 Potosi...6¼
50 Savage...15¾
30 Sierra Nevada...46¼
50 Silver Hill...2¼
300 Tiger...55c
100 Trojan...34@35c
70 Union Con...68
20 Utah...22¼
55 Yellow Jacket...19@19¾

AFTERNOON SESSION.

120 Andes...1

160 Alta	9@8¾	200 Leopard	90c
70 Bodie	41	210 Lady Wash	2½@2.40
200 Bullion	8¾@8¾	20 Mackey	2
225 Black Hawk	2.15	500 N Standard	1.20
230 Benton	6½@6¼	200 New York	95c
10 Belcher	6¾	500 New Coso	25c
10 Bechtel	2	150 Nob Hill	25c
900 Cosmopolitan	60@55c	100 N Bonanza	2.10
50 Chollar	8¼	50 Ophir	31¼
20 California	5¼	600 S Utah	30c
100 Caledonia	3¼@3.05	300 S Bodie	45c
50 Dayton	50c	30 Silver Hill	2¼
50 Exchequer	81	10 Savage	16¾
200 Gila	75c	350 Trojan	35@34c
55 Gould & Curry	12½	30 Union Con	6⅞
150 Julia	4.55@4.60	170 Ward	1¼
20 Justice	3.95	100 Woodville	50c

California Board—Latest Sales.

Wed'sday A.M., June 18.			
40 Alpha	24@24½	10 Yellow Jacket	18¼@18¾
30 Alta	9½@9¾	AFTERNOON SESSION.	
180 Andes	1	125 Ætna	35c
50 Belcher	6¾@6½	300 Atlantic	45c
60 Best & Belcher	18@18¼	400 Almaden G	1
70 Bullion	8¼@8	40 Alta	9¾@9¾
50 Brilliant	5c	50 Alpha	26@27
650 Con Washoe	5c@10c	25 Brilliant	25c
40 California	5¼@5¾	60 Bullion	8¼@8¾
70 Con Virginia	5¼@5¾	90 Belcher	6¾@6¾
330 Con Imperial	.85@.82	70 Best & Belcher	18¼@18¾
50 Crown Point	5¾@5.60	40 Caledonia	3
50 Chollar	8@8¼	90 Chollar	8¼@8¼
120 Challenge	2.95	70 Challenge	3.10@3.05
130 Caledonia	3½@3.10	40 Crown Point	5¾
550 Cosmopolitan	55c	300 Con Imperial	1.95@2
1000 Coso Con	14c	80 Con Virginia	5¼@5¾
45 Exchequer	8	30 California	5¼
40 Gould & Curry	11¾	100 Exchequer	8¼@8¾
350 Globe	15c	300 Enterprise	1¼
70 Hale & Nor	16¾@16¼	90 Gould & Curry	12¼@12¾
80 Julia	4½@4.40	100 Goodshaw	77½c
190 Justice	3.30@4	300 Golden Chariot	10c@12½c
60 Mexican	34@34¼	70 Hale & Nor	17¼@17¾
100 Mint	16c	110 Julia	4¼@4.60
30 Ophir	33¼@33¾	40 Justice	3¾@3.95
50 Orient	20c	50 Mexican	31¾@34¾
50 Savage	16@16¾	100 Newark	15c
50 Sierra Nevada	45¾@45¾	20 Ophir	34¼@34¾
250 Senator	30@31c	70 Potosi	6¼@6¾
600 S Utah	28@30c	150 S Bodie	45c
50 Silver Jacket	20c	950 S Utah	29@30c
350 Trojan	34c	40 Savage	16¾
800 Tiger	70c	150 Trojan	35c
30 Union	66	400 Tiger	75c
200 Wm Penn	25c	20 Union Con	6¾@6¾
300 Wells Fargo	25@25c	50 Yellow Jacket	19¼@19¾

The Mining Share Market.

The stock market during the past week has had a general downward tendency whenever the slightest opportunity offered. While there seems to have been sufficient confidence in some of the mines, developments are at a standstill. Although some stocks have taken a sudden rise, there is a fear that the rise is not caused by healthy conditions, and hence a fall is apprehended. Everything being in readiness for the Sutro tunnel opening, there will not be much movement in some directions until its effect has proved to be beneficial. It may be that Eastern manipulators have something to do with the present condition of things. Indeed, it is quite likely they may be justly accused of any shortcomings. The bugbear of capital being withdrawn from the State on account of the new Constitution being still hammered at in the East, bears all the semblance of truth, on the false principle that persistency in a deception finally arrives at truth. The fact, however, that Eastern capital seeks investment in our mining shares, would seem to indicate few valuable openings in the East, so far as speculative opportunities are concerned. Money follows the general laws of trade and seeks the most favorable opportunities to increase. Hence, there need not be the slightest ground to fear anything for the future welfare of our stock market. But we warn all, as we have repeatedly heretofore done, not to permit themselves to play the cat, and pull the chestnuts from the fire for Eastern capitalists. Watch wildcat schemes, and denounce all attempts at bulling the market. Since having driven out one devil, it will be wise for us not to harbor seven new ones, lest our latter end be worse than our first. It is well at all events to rally around our own interests and, without selfishly crowding out outside investors, preserve our own home affairs in a healthy, moral condition. We invite capital, and do not seek to hinder it from coming here, and all of our strictures must be regarded of having reference to our great desire to make investments in our mines as sure as investment in any other business.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

California, June 11th, $13,862.03; Bulwer, June 12th; $17,253.30; Standard, June 12th, $19,767.48; Northern Belle, June 11th, $2,370.67; Con. Virginia, June 11th, $83,169.64; Indian Queen, June 9th, $3,602.41; Bodie, June 17th, $36,000; Sierra Nevada, June 17th, $60,388.77; Alexander, June 12th, $7,100; Standard, June 11th, $17,529.39.

Negotiations begun 18 months ago for the purpose of securing to New York a grand obelisk now standing at Alexandria, Egypt, are successfully terminated. The Khedive has offered the monument to New York. Official papers to that effect have been received at the State Department.

Subscribers of the Press who would like a copy of Paul's pamphlet on Dry Amalgamation, can obtain one free by sending their address to Almarin B. Paul, Room 20, Safe Deposit Building, San Francisco.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Items.—*Ledger*, June 14: The cam shaft of the Bunker Hill mill broke Wednesday night. The mill is now idle, and must remain so until the shaft can be repaired. At Drytown, Collins & Misner, owners of the Exchange mine, have commenced work on their claim. There is No. 1 rock in the mine, with a ledge about four feet wide. They had some rock crushed about a week ago, which payed from $6 to $8 per ton. The Talisman mining company is now paying off its debts at the rate of 20 cents on the dollar, and will commence next Monday to sink their shaft 200 ft deeper. The Victoria mine, on Dry creek, was sold on the 12th instant to a company of San Francisco capitalists, and the new company are now negotiating with the Crown Point mill for the crushing of 200 tons of the rock, which, it is calculated, will pay $6 per ton on an average.

Monterichard. The east drift from the Monterichard mine, at the 350 level, is now in about 20 ft, at which point they have a ledge of fine looking rock from two and a half to three ft wide.

BUTTE.

Mining Matters. Oroville *Mercury*, June 13: The Wyandotte hydraulic mining company made a partial clean-up Friday, obtaining $1,300 in fine gold. During the 15 days ending last Friday, the bank officials purchased $9,000 in gold dust from individual miners working in this vicinity. Howell, Bassford & Co., of Colusa county, are reopening the old Eagle tunnel, which has lain idle for 17 years. The property is situated on Little Butte creek, about three miles above Dogtown, and is believed to be very rich. Machinery to drain the tunnel is now being put up Monday the Powers company shipped a retort valued at $2,500, as a result of ten days run.

CALAVERAS.

Champion Mine.—*Chronicle*, June 14: It has been our pleasing duty to record many rich yields of Champion rock, but we believe the last clean-up shows a better average per ton than any one previously noted. Thirty-five tons of rock netted $4,000! An average yield of over $114 per ton! Enough second-grade ore was subsequently crushed to swell the aggregate clean-up to something like $6,000. The main shaft of the Champion is now down 500 ft, at which depth levels have been run and stopes opened. The vein varies from 10 inches to 2½ ft in width. The mine is looking better than ever before in its history. The mills are kept in constant operation, a sufficient force being employed in mining ore to keep the batteries continually employed. Mr. Samuel Haskins, one of the proprietors of the Champion, who was here Sunday en route to San Francisco with a cargo of bullion, exhibited some very rich specimens of ore from the 500 level.

Fatal Mining Accident.—A miner named James Smith, an old resident of Angels, in this county, was instantly killed, on Friday of last week, by the caving of gravel upon him. We take the following details from the *Echo*, of Tuesday: Mr. Smith had just gone to work after dinner, in an open cut some 15 ft deep. The tub was lowered, and just as he was in the act of filling it, the bank caved from above, covering him over five ft deep, and literally crushing his skull. The alarm was given, and in a few moments 20 or 30 miners were on hand digging as rapidly as possible, still it took nearly two hours with all their exertions before they could get him out. When found he was standing against the bank opposite the cave, shovel in hand, as if in the act of shoveling into the tub. From the position in which he was found, it is quite evident that he was not aware of his danger until it was too late to make an effort to save his life.

EL DORADO.

Hauling Rock.—*Democrat*, June 14: Several parties are now engaged in hauling rock to Longley's mill, at Glencoe. Sundermyer & Co. have some 60 or 70 tons of good ore ready for crushing, and parties owning a mine near El Dorado are also engaged in hauling to the mill.

MONO.

Bodie Mill.—*News*, June 12: Col. Fogus, superintendent of the Bodie mine and mill, informs us that everything is running smoothly at the mill, and the ore being crushed will result in one of the biggest clean-ups of the season.

Real Del Monte.—We are informed by George Daly, superintendent of the Real Del Monte, at Aurora, that it is his intention to put in a 17-inch pumping gear, in order to handle the immense flow of water which impedes operations in the mine. This pump will be the largest of any in use in this section of country, and equal to any on the Comstock.

Tioga.—A double-compartment winze is down 55 ft on the footwall, on the line of the lode; clean ore six ft in width, of good grade.

Jupiter.—Shaft down 250 ft, 4x4½ double compartments—with crosscuts, drifts and ledges. The Masten ledge, 40 ft south has 2 ft of clean quartz. Daly ledge, somewhat broken, but assays as high as $70 in silver.

Dudley.—The 50 and 80 levels have developed a large body of ore of good milling grade, very high both in gold and silver. Some ore assays wholly in silver, carrying clean horn silver. Other ore assays high in gold and nothing else; still others assay in both metals. Three samples assayed as follows: No. 1, $400.10, silver, including horn silver in very substantial form; No. 2, $175.40, gold, and $597.30, silver—total, $772.70; No. 3, $507.89, silver and $190.50, gold—total, $788.39. There are much higher assays obtained.

Noonday.—Three compartments down now 90 ft. North drift on 200 level shows a ledge of good ore.

Defiance.—Shaft down 147 ft in the ledge footwall.

Queen Bee.—North drift in 210 ft; entirely silver bearing ore, without any wall on either side. Ore assays $5 to $35, all silver.

Brooklyn Con.—Quartz shows free gold without the aid of a glass.

Bodie Tunnel.—This tunnel is now in 1020 ft, with face in excellent vein-bearing formation.

Orient.—Shows a good ledge of milling ore.

Bullion Shipments.—*Standard*, June 13: The bullion shipments from Bodie district, through Wells, Fargo & Co., from the 1st to the 12th of June, have been as follows: Standard, bars, No. 132, $21,192.34; No. 133, $20,701.57; No. 134, $17,520.30; No. 135, $10,707.48. Total, $79,250.78. Bulwer, bar No. 14, $17,253.30. Noonday, bar No. 3, $4,070.50. Total of the district from 1st to 12th, $100,674.67.

A Rumored Consolidation.—It is rumored that the South Bulwer and Riqueza mines are shortly to be consolidated, upon what basis we have not learned.

NEVADA.

Mining Notes.—Grass Valley *Tribune*, June 14: The capital stock of the Excelsior Ditch and Mining Co., at Smartsville, has increased from $5,000,000 to $10,000,000. The Derbec mining company is now paying $2.50 per day, working 8-hour shifts. The old rates were $3 per day for 10-hour shifts. The North Bloomfield mining company have recently redeemed $50,000 of their 10% mortgage bonds. A fine specimen of copper ore has been exhibited in town this week by J. R. Nickerson, taken from a large ledge of his near Wolf creek, in the south end of Grass Valley township, near Bear river. Fine rock comes from the newly discovered quartz mine located about eight miles west of Wheatland, in the vicinity of Lone Tree hill. It is claimed that it is the richest quartz discovery ever made in that section. The tunnel of the Union gravel mine, situated near the head of Slate creek, has been run a distance of 710 ft. In the Centennial gravel mine, a large channel has recently been found which appears to be an overflow from the main lead.

PLACER.

Quartz Mining Items.—*Herald*, June 14: The Gould Bros. commenced hoisting the water out of the Booth mine last Monday. T. N. Goolsby and others are working what is called the Gold Leaf, also near Penryn. The rock they are taking out, we understand, prospects very well. R. Burns, of Michigan Bluff, and H. McCormick commenced work last Monday on the old Conrad mine, located on Duncan hill. They have started a new tunnel on the North Ravine side. This mine is owned entirely by Auburn parties. T. M. Tharp, on Duncan hill, has the water out and is again sinking. At present he is sinking in barren rock. The Eureka, located near the Eclipse mill, an extension of the Good Easter, is at present being worked by Hooper, Hillman and Bowen, and is turning out some very fine looking rock. The last crushing from this ledge paid about two ounces to the ton, and some 10 or 15 tons of ore now on the dump. Robinson and Fergurson have put up a whim and are reopening their old shaft on Posterior flat. Simons and Hurst are working an eastern extension of the Good Easter, on Posterior flat. They have the water all out and are ready to commence taking out ore. The Good Easter, owned by Holcom, Spring and Chesley, though only down a comparatively short distance, is paying remarkably well. The last crushing of about 24 tons yielded, we understand, nearly $3,000. It has already turned out considerable gold, and gets better by development. Shurtleff's mine, on Duncan hill, will yield, it is estimated, from $50 to $75 to the ton. The ore is of a dark blue cast, and in much of it gold can be seen with the naked eye Mrs. Kittler is working night and day shifts on her mine, located a little over a mile below Ophir, near the head of Georgia ravine. The prospects, we understand, are very flattering. Perkins, Fuller and White are working a ledge on Duncan hill, near Simons & Pelster's mill. It is reported that they have struck some good rock. Gooley and Myres are running a drain tunnel on what is known as the Bowlder lead, just north of Ophir. The shaft sunk on this lead showed some good prospects, though it was found difficult to work, on account of the water. The Crater has been running for some time on rock considered better than the average. They expect to clean up during the early part of next week. Edward and Arthur Tremillan, on their lead which they have been working some time, near the Bellevue house, are taking out some rich rock. Their last crushing, we learn, yielded them $49 to the ton. They have now on their dump some 15 tons of equally good ore. W. Pellow is working a ledge, also near the Bellevue house, and is reported to be taking out some very fine rock. The Julian, on Jenny Lind flat, is running steadily, with a full force of from 40 to 50 men. The large 24-stamp mill is kept pounding away day and night. In addition to these mentions, there is much prospecting going on, on a smaller scale. Altogether the activity in quartz matters in Auburn, Ophir and Newcastle districts was never greater than at present, and at no time in the history of the county, we believe, were the mines of these districts more uniformly paying for the labor expended in their development.

The Robertson Process.—The Robertson patent reduction works are now in operation at Ophir, and are sufficiently large to thoroughly test the merits of the process. At present they are operating on a pile of tailings from the Pugh quartz mill. The result, of course, of this first trial cannot be known until they clean-up. The necessary machinery is simple, and the process is by no means complicated. The ore is first roasted, then plunged into a chemical bath, then ground through the pans, and from the pans run into a settler. It is claimed to be cheaper than the chloride process, while it saves equally as much gold.

Law Suit.—The suit of the Dardanelles gravel mining company vs. the Mayflower gravel mining company, which has occupied the District Court for the past 11 days, has resulted in a drawn fight thus far, the jury having disagreed. They stood eight to three in favor of plaintiff, one man having been excused from serving, because of illness. The suit was instituted to recover damages caused by the defendant washing away a ditch belonging to plaintiff, and also to obtain a perpetual injunction restraining the former from further working that part of their claim where the alleged damage was wrought.

SIERRA.

The Downieville *Messenger* says there is great excitement in Sierra City and vicinity over the recent rich gravel discovery in the ridge southeast of that place. From a wheelbarrow load of gravel $8 were obtained. The whole country has been located, if reports be true. Many have great faith in the discovery, and believe that an immensely rich gravel deposit underlies the ridge for many miles. Some four or five new tunnels have been started, or are about to be started on the gravel range, recently discovered above Sierra City. Hart & Co., the discoverers of the lead, have run some 70 ft through fine rich blue gravel, and the end is not yet. This section gives promise of being a very hive of industry this summer.

TRINITY.

New Mill.—*Journal*, June 14: A new five-stamp mill for Davis Bros., of Bullychoop, arrived at Anderson last week. It will be put up and in operation at the mine by the middle of next week.

Struck it Rich.—The Dixon Bar mining company have lately struck a good body of very rich gravel—reported to be the best ever found on Trinity river.

TUOLUMNE.

Sonora.—*Democrat*, June 14: We understand the owners of the Live Oak mine are stoping out very fine ore. The sulphurets in this mine are of high grade, assaying some $500 per ton, about $75 of it silver.

NEVADA.

WASHOE DISTRICT.

Justice.—Gold Hill *News*, June 18: Connection is about being made between the winze from the 900 level and workings on the 1000 level. This winze is sunk in the ledge, and has followed a three-foot vein of rich ore which was discovered on the 800 level. The ore is worth from $150 to $200 a ton, two-thirds of the yield being gold.

Belcher.—The incline has reached 58 ft below the 2760 level. South drift is in quartz and porphyry assaying from $7 to $8.

Lady Bryan.—Both drifts are in low-grade quartz.

Niagara.—After a rest of about two years, work is resumed at this mine, and steam was started up this morning, the machinery working well. A full force of men are at work lining up and repairing the incline above the 500 level.

Sierra Nevada.—The water has been all raised from the incline, and Tuesday morning the work of sinking was resumed. The sump will be completed in two weeks, and then the stations at the 2300 and 2400 levels will be opened out, preparatory to opening up the levels themselves. No more trouble is anticipated from the water. The stopes continue their accustomed yield, and the dump is full of rich ore. The stopes are not being extended to the south, as many suppose. They are being carried on up from the present sill floors. The mine made its first shipment of $60,000 last evening.

Savage.—The drain is being carried and covered along the 1640 level toward the Sutro tunnel. Connection will be made the last of the week. The pumps and columns above the 1640 level have all been hoisted out, and the old air-boxes will be also out in a few days. The pumps below the 1640 level are in prime order. No change in the water of late.

Con. Imperial.—The north drift, on the 2600 level is being extended at the rate of from six to seven ft per day, and is now 350 ft from the south winze. This drift is following the trend of the vein which is northeasterly. The 2400 level drift, on account of its diagonal course, ran 610 ft between the lines, and accordingly this drift has some 250 ft yet to run to connect with the north winze.

Sierra Nevada, Mexican & Union Con. Shaft.—Sinking the shaft has been going on as usual during the past week. The material encountered is hard, blasting porphyry.

Gould & Curry.—The joint east drift, 1700 level, is again being pushed toward the perpendicular of the Osbiston shaft, and its face is now in porphyry and clay 950 ft from the lateral drift.

Con. Virginia.—The joint drift west, 850 level, is passing into a softer material showing some water, through which it is making rapid progress. Four ft per day are being added to the length of the south drift, 1500 level, running west of the old stopes, the face in vein matter showing streaks of quartz. The south drift, 2150 level, is making four ft per day through vein matter carrying streaks of quartz; total length, 175 ft.

California.—The joint west drift, 850 level, is in softer material carrying some water; total length, 240 ft. Sinking has not yet been resumed at the C. & C. shaft. A diamond drill is being sent down ahead to prospect for water. The 900 bob-station is completed, and a tank is being cut out at the 1050 station from which connection will be made with the general drain pipe leading to the Sutro tunnel.

Alta.—The east crosscut, 1350 level, is 28 ft in quartz containing spots of ore. The north drift, 1450 level is entirely in fine-looking quartz. The north drift, 1550 level, has entered Lady Washington ground, and is in promising quartz and clay. The north and south drifts, 1750 level, are each in 95 ft, and are bending around toward the vein, but have not yet reached the clay of the vein. Sinking for a lower level will be resumed next week. A tank for the 1750 level is being cut out. All work is making good progress.

Sutro Tunnel.—The work of retimbering the tunnel through the swelling ground, near the Savage, is making good progress. The work is being thoroughly and well done. The sub-drain will not be completed at the date required by the contracts, but Mr. Sutro explains what he means by "that will make no difference," by saying to the mining companies that the boxes at the Comstock end will be placed on the top of the bottom of the tunnel and ready for use July 1st. They will then be lowered to their place as opportunity offers.

Utah.—The main incline has attained a depth of 20 ft below the 1750 level, the bottom in good sinking ground. The lower tank station in the vertical shaft is being retimbered and the tank rebuilt.

Yellow Jacket.—Sinking has been suspended a short time to send a diamond drill down ahead to prospect for water, but was resumed this morning; depth of shaft at that time, 103 ft below the 2500 station. Work to connect the old explorations with the shaft, 2500 level, is making good progress.

Crown Point.—A drift has been started south to connect with that coming north on the 2700 level of the Belcher, and to serve as a base for future crosscuts. The north drift, 2500 level, is being pushed along the wall of the vein at the rate of from six to seven ft per day.

Homestead.—The work of excavating a side chamber, preparatory to sinking a winze on the ledge encountered in the tunnel, was commenced to-day.

Bullion.—Everything has been prepared and repaired, and once more the work of sinking the winze below the 2150 level is making good progress.

Trojan.—The northeast drift, third station, is being pushed in quartz, clay and porphyry, and is making good progress. The north drift from the upraise to the second level is passing through quartz giving fair assays.

Silver Hill.—Opening up the station at the 1300 level and preparing chutes, etc., for use on this level. On the surface, considerable changing and repairing is going on. The upper workings are yielding from 15 to 20 tons of ore per day.

Hale & Norcross.—Repairs to the eighth station have been completed. Everything is being looked to and put in readiness for use as soon as the Sutro tunnel is ready to take the water of the mines.

Best & Belcher.—The joint east drift, 1700 level, is in 950 ft, in porphyry and clay. The Osbiston shaft is making slow progress in sinking, on account of the heavy flow of water encountered.

PARADISE DISTRICT.

Eagle Mine.—*Silver State*, June 13: The Eagle mine, in Spring valley, has been sold to the Van De Water gold and silver mining company, of Nevada, a corporation composed of New York capitalists. The deed for the property was filed in the Recorder's office yesterday. The consideration is $2,000,000, part cash and part stock of the corporation.

Paradise Items.—B. F. Riley, who arrived in town from Paradise last evening, says it was reported that a very rich body of ore had been struck in the Big Prize mine last Thursday. He was shown a piece of the ore as large as a hen's egg, which was more than half silver. The Paradise company's mines, which embrace what were originally known as the Mountain Bride and Rough and Ready locations, have produced from ores shipped to Salt Lake and Rye Patch at least $200,000, and miners say that not one-half that amount has been expended in developing ores, of which there are now nearly 2,000 tons on the dumps. The same is true of the Big Prize, Bullion and other locations.

Live Yankee.—*Herald*, June 14: The owners are at present driving a tunnel on the line of the ledge and taking out about three tons of rock each shift, and are working two shifts per day. The rock contains a large amount of sulphurets and black galena, and shows some free gold. It is an excellent looking quality of rock, and will, without doubt, pay well. A crushing of 40 tons was made this week, but we have not learned the result. The ledge extends down nearly perpendicular and increases in thickness and richness of ore as they go down. At the place where ore is at present being taken out, it is nearly six ft thick. About 50 tons of rock are at present on the dump.

Ironclad.—*Transcript*, June 15: Within the past day or two a three-ft ledge of very rich quartz has been struck in one of the drifts of the Ironclad mine, below Rough and Ready.

Crosley & Olive Mine.—There is a heavy body of high-grade ore, and some of it under the incline assays as high as $800 per ton. This rock has many of the characteristics of the tellurium ores of the Bobtail and Gregory lodes in Colorado.

WILLOW CREEK DISTRICT.

Items.—Paradise *Reporter*, June 14: Our mining-expert reporter returned last week from a trip to Willow Creek mining district, and pronounces it one of the richest in the State. Leaving Paradise, the road to the mines bears to the northwest, and is an easy one to travel over until the summit (about 10 miles from here) of the Mount Rose range of mountains is reached, when it becomes necessary to dismount and lead your horse down and around very rocky cliffs. On the road we passed a number of magnificent fields of wheat and barley, and a quantity of bunch and other wild grasses sufficient to feed several thousand head of stock all summer. In fact, the country looks beautiful. There is also in the district a great deal of fuel—such as mountain mahogany, cedar and cottonwood trees—easy to get at. The prospects of the camp are bright, and the mines are all looking well. We found that the Ethan Allen drift has been run in on the ledge 21 ft, in good ore all the distance, and looking splendid in the face of the tunnel. The ledge is now 10 ft wide, and several assays just made, from an average of the ore, show returns of from $80 to $190 per ton. Drifting is being pushed vigorously ahead, day and night. The enterprising owners have built a wagon road to within 300 yards of the mine. They frequently encounter native silver and stefenite. There is an abundance of water, and at least 10,000 cords of wood can be procured within a distance of six miles.

ARIZONA.

Tombstone.—*Star*, June 12: The Tombstone mining company's mill, on the San Pedro, eight miles from the mine, is running on third-class ore from the Toughnut mine, and working through 15 tons per day, saving the metal by raw amalgamation up to 86% of the assay value, and giving bullion 068 fine. A roasting furnace is going up to work first and second-class ores, which are much richer in silver and gold, but need roasting. The first silver brick was turned out last week. It was about $2,000

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Public Libraries.

[Address delivered by A. S. Hallidie at the opening of the San Francisco Public Library, June 7th, 1879.]

The public school system of this country—a system worthy the respect of every citizen, and which, in spite of many imperfections, stands to-day the glory of this land and the admiration of enlightened nations—has grown up from the infancy of this nation parallel with it in character, coequal with it in strength and breadth, as deep seated as the roots of the tree of liberty, and expanding in glory and beauty as it sustains this nation's life, and gives vigor and vitality to all our institutions and national characteristics. From this grandest of all testimonials to the intelligence of the American people have emanated the public libraries of this country, so generally recognized as adjuncts to and essential sequences of the public schools, which educate the mind, in maturer years, to avail itself of the typical thoughts of men of the past and present, saved to us by the art preservative. As the apprentice is taught in the practice of his art to use the tools of his craft or the swimmer is taught to swim, so the scholar in the public school is taught the use of books. Destroy the tools and there is no need of the apprentice; remove the water, the swimmer's occupation is gone; abolish the public libraries, the usefulness of the public schools is impaired; by neglecting your harvest, what availeth the seed?

The libraries in the United States are the institutions of the people. From them they sprung and to them they belong; the rich need them not, nor the public schools. Bigotry abhors public libraries and hates public schools. But to the people—to nine-tenths of my fellow citizens they are each and both the guardian of their liberty, the guaranty of their independence. Knowledge is power—and a knowledge of power is independence. With apparent spontaneity libraries have developed in almost every hamlet and town where the public-school system exists. The exceptions are indeed rare; San Francisco being an example of this exception, the more astonishing from the recognized high educational standard of her public schools. Happily this cloud over her fair reputation is about to be removed.

Until quite recently the libraries of this country have been independent of each other in organization, management and experience. The Centennial celebration gave an impetus to every department of science and art, and the National Bureau of Education vitalized and gave form and homogeneity to the scattered and varied library interests of the country.

The conference of librarians held in Philadelphia in 1876, first fairly brought before the world the main features of the work being done by them and produced that valuable and now scarce report on the Public Libraries of the United States by the Bureau of Education. The result of this conference was so well appreciated abroad that a similar one was held in England in the city of London the year following, when a large number of delegates were present from the United States. This convention, in acknowledgement of the earnestness of the work done in this country, adopted the *Library Journal* published in Boston, Massachusetts, as the official organ of the libraries of Great Britain. That the subject has become of extreme importance and public interest may be gathered from the fact that last year a further conference was held in Oxford, England, and that during the present month (June) a conference will be held in the city of Boston, Mass. The results of the conferences will be a more thorough understanding of the mission and scope of public libraries, a greater compatability in their management, an exchange of good offices, the elimination of much valueless material that hampers the shelves, and the grading of the libraries.

My recent visit to the principal libraries of the United States has increased my respect for them and my appreciation of the great work they are doing. Few persons can have any conception of the careful thought, untiring energy and disinterested efforts of the many self-sacrificing men and women of this country who are, and have been devoting themselves to the cause of education and better morals by means of the public libraries.

I propose very briefly to refer to three of the libraries I visited and which I think may be taken as representatives of separate classes—the public library of Worcester, Apprentices' library of New York, and the public library of Boston—the first meeting the wants of a thriving manufacturing district, the second supplying the needs of young men and women actively employed in some trade, the third to supply the general public of a city of more than average intelligence.

In 1859, Dr. John Green gave to the city of Worcester a library of 7,000 volumes for reference and consultation, and to be used only in the building. Immediately thereafter, the Worcester Lyceum and Library Association presented its library of 4,500 volumes as a nucleus for a library of circulation, both of which the city accepted, and thus established the Free Public Library of the city of Worcester. In 1865, the citizens raised a fund of $11,000 to maintain a reading-room, and in the same year the library received a legacy from Dr. Green of $30,000, as a permanent fund, one-fourth of the interest of which was to be added to the principal. The library now consists of 46,000 volumes, of which about 26,000 are for reference, and 20,000 for circulation. During the past year 132,384 volumes were taken home and read, and 30,079 were read in the reference room. There are 15,547 names of persons entitled to use the library on the register. The library is open every day, including Sunday, for reading, from 2 to 9 P. M., and the average Sunday attendance is 248. The library is in a good substantial stone building, and is well supplied with general literature, but is especially rich in illustrated works on the arts and industries; and there is not a mechanic or artisan in Worcester but can find there abundance of authorities and information on his trade or calling.

Worcester has a population of about 50,000. It is quite a manufacturing center, and as busy a town in proportion to its population as any in Massachusetts; and it is to be congratulated upon the excellent care and judgment that have been exercised in the selection of books so well adapted to the needs of the community. Here we have a town with a population of 50,000 souls, with an exceedingly valuable public library of 46,000 volumes, or nearly one volume to every man, woman and child living there.

The Apprentices' library, in New York, although occupying a building not constructed or particularly well adapted for the purpose, is perhaps the best arranged library of its size and for its opportunity, of any I have visited. The impression on entering was exceedingly agreeable and striking. The library room proper is 104 feet long by 36 feet wide. The light comes from the roof, through a skylight 75 feet long by 16 feet wide, and the bookcases are arranged in alcoves surrounding the room on two sides and one end three tiers high, eight feet deep; each bookcase is eight feet high and has a space of three feet between. In this room also are the waiting room, delivery desk, librarian's desk, etc.; and the shelving, containing 60,000 volumes, has room for 40,000 volumes more. The light is ample, the books easy of access, and opportunity for classification is admirable. The library is quite an old one, as the General Society of Mechanics and Tradesmen, of the city of New York, was chartered in 1792. The library is owned by this society, but it is a free library, and open to all young men and young women who are actually engaged in active employment. It circulates 128,000 volumes annually, and the evening I was there the reading rooms were well filled; and there were at one time about 50 boys and as many girls selecting books on the catalogue and awaiting the delivery. The utmost order and decorum prevailed. It was a great pleasure to see the good work this library was doing among these young toilers and workers, and the interest they took in the library.

The Boston public library was started in 1852, through a gift from Mr. Joshua Bates, of $50,000 to the city. A site was selected and a building erected at a cost of $365,000, and was opened to the public in 1858. Its growth has been remarkable, and it stands to-day at the head of the libraries in the United States as much in the number of its books, liberality of administration, extent of active work and thoroughness of organization.

In order to make the work of the library as useful and general as possible, there are eight branches located in different parts of the city, which enable citizens to obtain books without too great a distance to travel. The number of books in the library at this time exceeds 350,000 volumes, and there were issued during the year 1,183,991 volumes, which were taken home and read. Ten years previous (1868) the circulation was but 75,570. The number of persons registered who have applied for the use of the library since 1852, is 128,141, of which 75% may be considered active. The population of Boston is about 400,000, thus giving, as in the case of Worcester, nearly one volume to each man, woman and child in the city.

Of course, such a library requires a large force to carry it on, and there are about 130 persons engaged, the amount of salary being about $65,000 annually, and the amount invested in books for the past five years being $150,000. As high as 10,478 books have been withdrawn in one day from the central library and its branches, and the loss from all causes does not exceed one in 10,000.

The influence of the Boston public library has been and is most marked, which is largely due to the appreciation of its great value by the citizens, and the earnestness and intelligence exercised by its late librarian, Mr. Justin Winsor, (now at Harvard).

It is no use tiring your patience with any reference to other libraries I visited. Suffice it to say, that at St. Louis, Indianapolis, Cincinnati, Baltimore, Philadelphia, New York, Boston, Brooklyn, Pittsburg, Cleveland and Chicago I found well-established, free public libraries, all active and growing; and there remains the city of San Francisco, with its population of about 300,000 souls, with its feeble attempt at a public library, disputing over the miserable appropriation of $24,000.

In the year 1800, there were, all told, 80,000 volumes in the various public libraries in the United States. Seventy-six years later, there were 2,958 public libraries, possessing 12,039,724 volumes. In 1860, there were 27,730 public and private libraries, with 13,316,000 volumes; and 10 years later there were reported 164,815 public and private libraries, with 45,629,000 volumes.

Joshua Bates gave Boston $50,000 to start its public library, and added $50,000 more before he died. Peter Cooper gave the Cooper Institute 17,500 volumes to establish its library, and this was but a fraction of his princely benevolence in similar directions. George Peabody gave Baltimore $1,400,000 to establish a library there. John Jacob and William B. Astor gave New York $700,000 to found and maintain the Astor library. John Lenox gave $700,000 to found the Lenox library in New York, and is still adding. Walter N. Newberry has left $2,000,000 to Chicago to establish a library on the north side. Joseph Fisher left Philadelphia $55,000, and Dr. James Rush left the same city $1,000,000 to maintain a library there. Mr. Howes has just left the Boston Athenæum $150,000 towards its library, and Mr. Asa Packer has given $500,000 to the library of the Lehigh University, and these are but a few of the gifts that have been made to the libraries of this country.

I cannot but feel humiliated that San Francisco should have so long stood alone not only without a great public library, but without any of those public galleries and halls which tend so much to make a community better in thought and action.

The public libraries of America have a unique existence and a patriotic object. They are not gathered together by the vanity of national pride or wealth, and are thus different to the great libraries of bygone ages, but they are built up by the necessities of conditions peculiar to the American people; they are the guide, the friend, the solace of the workingman and toiling woman—the instructor, the hope and the rest. The public schools make them a necessity, and to impede their success, their progress, or their usefulness by ever so little an obstacle is a crime before God and man.

Let us then earnestly unite in destroying the difficulties in the way, and with those difficulties sweep away those who through ignorance or viciousness would retard the onward progress of the Public Library of San Francisco.

The Telluride Ores of Gold.—No. 2.

[Thesis by Russell L. Dunn, College of Mines, University of California.]

Mineralogy.

The mineralogy of the tellurium minerals is extremely interesting, since tellurium is the only non-metallic element with which gold occurs in chemical combination in nature. These minerals are never found very far from gold. The native tellurets invariably contain at least a trace of gold. So intimate is this relation that we may consider all of the tellurium minerals in connection with its gold combinations, and although only two or three of the latter are abundant enough to constitute ores, their discussion, without reference to the others, would be incomplete. Some of these species are extremely rare and have only recently been discovered, most of them in Colorado. Several mineralogists have been investigating these minerals, and the results obtained by them are of considerable value and interest. I shall first take up a few of the most interesting of these minerals in detail, giving such results of investigations already made as may be peculiar or practically useful, without stating all the technical details. These latter can readily be obtained from standard mineralogical works or the references cited.

Sylvanite or graphic tellurium is the principal telluride ore of gold. It has been extensively mined for that metal in Transylvania, where it was first discovered. In both California and Colorado it is found; in the latter it is quite important, metallurgically considered. *The chemical composition of the Colorado mineral seems to differ somewhat from that of Transylvania, but not enough to be considered a distinct species. The following will show the relative proportions of gold and silver in each variety:

Colorado (Silliman)	Au 1.7	Ag 1.0
Transylvania (Berzelius)	Au 1.8	Ag 1.0

Calaverite was first found accompanying other telluride minerals in ore from the Melones mine, Calaveras county, California, by Dr. Genth. It is the most valuable of the telluride minerals, as it contains the highest percentage of gold. It occurs massive and without any indications of crystallization; color, bronze yellow; streak, yellowish gray; brittle; fracture, uneven. From 3.06% to 3.52% of silver is present. An analysis made of the mineral from Colorado gave the composition as follows:

Au	39.01
Ag	3.09
Te	57.99
	100.00

This composition corresponding to the formula ($\frac{2}{3}$Au $\frac{1}{3}$Ag) Te$_2$. Dr. Genth considers the yellow variety of *Sylvanite* found in Transylvania to be nothing but impure *Calaverite*.

Coloradoite was discovered in Colorado associated with other tellurium minerals. It has, as yet, been found nowhere else. It occurs massive, somewhat granular; color, black, inclining to iron-gray; luster, metallic; hardness, about 3; fracture, uneven to euh-conchoidal; sp. gr. is 8.627. Before the blow-pipe, in a closed tube, it yields mercury, tellurious acid and tellurinm. A specimen from the Keystone mine, Boulder county, Colorado, showed, on analysis, the following composition:

Te	42.05
Hg	52.23
Cu O	0.48
V2 O3	0.70
Fe	2.44
Mg O	.11
	99.32

Dr. Genth, who made the above analysis, considers its formula to be Hg Te, corresponding to Hg Se and Hg S. I am informed that native mercury has been found accompanying this mineral. It, of course, results from the decomposition of the telluride.

Altaite is found in considerable quantities (comparatively) in both California and Colorado in their respective telluride districts. Its formula is Pb Te, a small portion of silver almost invariably replacing some of the lead.

Henryite was discovered and named by Prof. Endlich, who found it in Red Cloud ore from Colorado. It seems to be exceedingly rare. In its physical properties it resembles *Altaite*, but differs from it in chemical composition. An analysis gave the following result:

Pb	59.19
Fe	5.05
Ag	0.31
Te (by difference)	41.45
	100.00

This agrees very nearly with the formula 3Pb Te+Fe Te, with a little of the lead replaced by silver. Pyrite invariably occurs with it, but there is not the slightest trace of sulphur in the pure mineral.

Hessite Group.

There are a number of tellurium minerals very much resembling each other in appearance and physical properties, but differing slightly in chemical composition. They can all be considered as hessite in which gold is present, replacing the silver from a trace upward. I have accordingly, for want of a better name, called them the Hessite group.

Table Showing Composition and Gold and Silver Ratios of the Hessite Telluride Group.

LOCALITY.	NAME.	FORMULA.	COMPOSITION. Au.	Ag.	Te.	Others.	Ratio of Au to Ag
Siberia	Hessite.	Ag Te.	trace	62.8	37.2		
Colorado	Au. Hessite.	.....	7.13	51.06	.....	.....	1
Calaveras	Petzite.	Ag$_3$ Te+Au Te.	25.3	41.0	33.7	.....	1
California	Petzite.	Ag$_3$ Te+Au Te.	25.3	41.8	32.7	.....	1
Colorado	Schirmerite.	Ag$_3$ Te+(Au Pe) Te.	18.3	25.0	.....	Fe, Pb.	1
			.....	.....	.....	.....	7.1
			.....	.....	.....	.....	2.44
			.....	.....	.....	.....	1.65
			.....	.....	.....	.....	1.5

Of †auriferous hessite, Prof. Silliman, who has investigated it, does not give a complete analysis. Of ‡Schirmerite, discovered and named by Prof. Endlich, the formula ie only given as probable. He gives the result of an incomplete analysis. Petzite is the principal gold-bearing telluride in the California veins and occurs in nearly all of the mines where tellurides are found in Colorado. Besides the mineral species already noticed, tellurium and gold are found associated in several rare minerals, generally accompanying some of the former, but they are of no importance as a source of gold and will not therefore be considered.

The greater amount of all these gold-bearing tellurides is disseminated throughout the mass of silicious ganguc. In pockets, bunches and seams of pure mineral are sometimes found, but rarely of any great size. Sylvanite and petzite sometimes occur foliated, and the latter would seem to be composed in many cases of thin flat scales, so fine as to float in water. Sylvanite has the lowest specific gravity, about 5.7, and from this up to 8.28; the average of the others is about this latter figure. All are quite soft, ranging in hardness from 1.5 to 3.5.

Associated Minerals.

The associated mineral species are, with few exceptions, not characteristic. Among the exceptions may be noted the rare vanadium mineral, Roscoelite. It was first discovered in one of the telluride veins in California and has since been found in Colorado. A Colorado mineral considered by Dr. Genth, who has examined it, to be a variety of Roscoelite, with the vanadium nearly all replaced by aluminium, is common enough to be sought after as an indication of the presence of tellurides. It occurs as a green stain in the quartz. It is itself perfectly barren of gold and silver, but is often associated with the telluretted minerals of these metals. The California mineral is said by Dr. Blake to be microscopically interlaminated with gold.

A knowledge of the character and amount of the minerals present in an ore as impurities is indispensable to the metallurgist. In the ores of gold and silver the amount of these impurities is usually far greater than that of the valuable mineral, and, as a rule, on them, and not on the condition of the gold and silver, does the choice of the whole or part of the process employed depend. Though this is hardly the case with the telluride ores, the principal difficulty

*"American Journal of Science," 1874, Vol. VIII., No. 43, p. 25.

†"Proceedings Am. Phil. Soc. of Philadelphia," Vol. XIV., p. 230.

‡*American Journal of Science*, Vol. VIII., No. 43, p. 25.

§"U. S. Survey of Colorado," Hayden, 1876, p. 354.

with them being to get rid of the tellurium without losing gold at the same time, still they have more or less influence in determining the line of treatment.

For the purpose of comparison I give a list of associated minerals, as found in two or three of the localities where these ores are mined:

1st. Stanislaus mine, near Robinson's Ferry, Calaveras county, California. The gangue is quartz. Mineral species are dolomite, calcite, siderite, pyrite, chalsopyrite, a titaniferous iron, mispickel, and in small quantities, galena, sphalerite and roscoelite.

2d. Red Cloud mine, Boulder county, Colorado. Gangue, an impure quartz containing crystals of feldspar. Mineral species are pyrite (abundant), galenite and sphalerite in small quantities; no silver or copper compounds with sulphur, are found. [Endlich.] The same will answer for the other tellurido mines of Boulder county, except that arsenical and copper pyrites are found in some of them.

As shown by the preceding there is a great paucity of mineral species—excepting tellurium compounds—in these veins, and in fact in all of both California and Colorado deposits of workable tellurides the same peculiarity is observable. This paucity is still more marked in comparing them with the deposits in Transylvania. In the veins of Nagyag, over 40 distinct mineral species are found.

The following is a list of the tellurium minerals thus far found in the United States. The localities are also given. All are more or less rich in gold and silver:

1. *Altaite.*—Melones and Stanislaus mines, Calaveras county, and the Golden Rule and Green mines, Tuolumne county, Cal. In nearly all of the telluride mines of Boulder county, at the head of Blue river and near Lake city, San Juan county, Col.

2. *Calaverite.*—Stanislaus and Golden Rule mines, Cal. Several mines in Boulder county, Col.

3. *Coloradoite* [Hg Te].—Boulder county, Col.

4. *Henryite.*—Red Cloud mine, Boulder county, Col. It will probably be found in other mines in the same vicinity.

5. *Hessite.*—Near Georgetown, El Dorado county, Cal. (float). It probably occurs mixed with other telluride minerals in both California and Colorado.

6. *Auriferous Hessite.*—Red Cloud, American and other mines in Boulder county, Col.

7. *Lionite.*—Mountain Lion mine, Boulder county, Col. (Gentb).

8. *Melonite* [Ni_2 Te_3] (?).—Stanislaus mine, Cal. (Genth).

9. *Montanite.*—A telluride of bismuth, Highland, Montana Ter., (float). (Gentb).

10. *Nagyagite.*—Several mines in Boulder county, Col.

11. *Petzite* [3AgTe + AuTe].—Calaveras and Tuolumne counties, Cal. Boulder county, Col.

12. *Schirmerite.*—Red Cloud mine, Col.

13. *Sylvanite.*—Stanislaus mine, Cal. Boulder county mines, near Lake City, San Juan county, near Parrot City, Col.

14. *Tellurite* [TeO_2]. Smuggler and John Jay mines, Boulder county, Col. (Gentb).

15. *Tellurium.*—Calaveras and Tuolumne counties, Cal. Boulder county, Col.

16. *Tellur-pyrites.*—Boulder county, Col. (Sbepard).

17. *Tetradymite.*—Several localities in the gold region of Virginia, North Carolina and Georgia, Boulder county, Col.

In addition to the localities already mentioned, tellurides have been found or reported to have been found in several other places. In Boise Basin, Idaho Ter., workable deposits of the gold-bearing tellurides (probably similar to those of Colorado) have been found. At several points in a line from Boulder county to Lake City, San Juan county, in Colorado, unimportant discoveries have been made. In the northern part of Kern county, California, tellurium minerals are reported to have been found in the Harley mine, seven miles from Kernville, and near Bahton. Some years ago a telluret was found in quartz from Grass Valley, Nevada county, also in the Tellurium mine, Amador county. Finds have been reported during the last few weeks in San Luis Obispo and Sierra counties. These minerals have a much wider distribution than was thought a few years ago, and it is reasonable to suppose that as some of the new gold quartz districts of Colorado, Idaho and Montana become explored and developed, new discoveries of value will be made.

[To be Continued.]

RAPID COMMUNICATION.—A merchant, sitting in his office in South-street, New York, recently received an answer to his dispatch sent to Shanghai, six hours previously. Thirty thousand miles in six hours is good time even for the telegraph. The charge to Shanghai is $2.80 per word; to Yokohama, $3.05; but the code, or cipher, is so well systematized by certain mercantile houses, that a single word serves for a dozen when transcribed.

KEEPING PACE WITH THE ADVANCE OF SCIENCE.—It is an interesting fact that the progress of scientific knowledge is so rapid that the great cyclopædias and dictionaries, instead of being always infallible authorities, are compelled to make frequent amendments. Being stereotyped, they are compelled to melt up their whole stock every few years, and reprint the whole or soon become unreliable and antiquated.

USEFUL INFORMATION.

Spontaneous Combustion Practically Considered.

Although of paramount importance to machine shops and all industries requiring the use of swift running gear, oil, packing, rags, etc., spontaneous combustion seems to have assumed the mixed phase of spontaneous generation. In both cases the cause is disregarded, and the effect mostly considered. It is a fact, however, that machine shops, mills, etc., are destroyed by the spontaneous ignition of certain elements, the origin and nature of which are as perfectly known to science, as any can be. In the case of oiled rags, we know that heat is gradually developed by the absorption of the oxygen of the atmosphere, until the hydro-carbon of the oil ignites spontaneously. It is the nature of these elements to do so, and we need not be more astonished that such ignition should occur, than if we were to apply a lighted match to gunpowder, and an explosion follow.

In the case of a boiler covering or packing, the same elements concur to produce the same result, viz., the heat of the boiler gradually carbonizes the covering or packing, and the hydrogen of the atmosphere uniting with it, is operated upon finally by the oxygen until ignition takes place.

The same may be said of wood work exposed to continual or repeated heat, as the flooring under and surrounding a furnace or stove, or near a stove-pipe. Here, although the metal is not in contact with the wood, yet the heat of the metal carbonizes the atoms floating near it in the atmosphere, which falling or settling upon the wood work accumulate to such a degree, and permeate the pores of the wood so completely, that the atmosphere operating upon it finally causes ignition, which consumes the wood.

In machine shops, particularly in mills where the machinery is run at a high rate of speed, the friction generated by the motion carbonizes the atoms which are always floating in the atmosphere, and which penetrating everywhere, even into the pores of dry exposed wood, or other porous combustible material, bring about ignition silently but as surely as a direct application of fire.

Of course an explosion often occurs, but this is simply the rapid ignition peculiar to all hydrocarbons.

It is useless to deride these facts, cases of spontaneous combustion are increasing in frequency, principally in old establishments where the carbonizing process has been going on for years, or in those more recent ones in which nature is aided by the carelessness of man, and her otherwise slow but sure processes accelerated.

Perhaps a remedy would be a thorough renovation, and the use of plenty of incombustible paint on all surfaces exposed to favorable influences. Of course old and dry wood, saturated with carbon, could be prevented from any further chemical action, while new wood would have its pores filled up by the use of such paint to the exclusion of deleterious atoms.

Many of our hydro-carbons will not stand a fire test of 60°, and even those in common use do not rise above 110°; so that the heated atmosphere of our shops and mills, often much greater than this, will operate as too high a fire test.

Precaution is much less expensive than the expenses of litigation to recover insurance, more especially since courts, led astray by professional experts, hold that the damage is caused by the explosion and not by fire—placing effect again before cause. Shooting off the gun without igniting the powder.

TO PREVENT MOLD IN CELLARS, ETC.—To prevent the formation of mold in malt cellars and fermenting cellars, it is not sufficient to paint the walls, floors and ceiling with ordinary milk of lime or whitewash, but it is well to add some carbolate of lime. It would also be worthy of a trial to paint the outsides of fermenting vats with water-glass, to which some salycilic acid has been added. The vats would probably gain in durability as well as density. Phenol is frequently preferred to salicylic acid as an antiseptic. That this preference is not quite justifiable was shown by the experiment that 25 milligrammes phenol interrupted the germination of 100 grains of barley; but on the evaporation of the phenol, the grain regained its germinating power. A mixture of 50 milligrammes salicylic acid, with 50 cubic centimeters water, destroyed the germinating power of the same completely.

INCOMBUSTIBLE PAINT.—In connection with the query as to how combustible surfaces are to be protected from fire, spontaneous or otherwise, we call attention to the fact that water-glass, or soluble silicate of soda, will, in most cases, be a protection against fire, and may be mixed with any paint. Beams, lath, hoards, etc., painted with colors containing water-glass, are found to be unaffected by fire. The proportions are as follows, viz.: 25 parts by weight of pulverized haryta spar, which is mixed dry with one part of zinc white and made into a pulp with 20 parts of water; then add 25 parts of water-glass, or silicate of soda. When using this paint, it must be stirred frequently. Three coats are generally enough.

A NEW DISINFECTANT.—Dr. John Day, of Geelong, Australia, recommends for use in civil and military hospitals, and also for the purpose of destroying the poison germs of small-pox, scarlet fever, and other infectious diseases, a disinfectant ingeniously composed of one part of rectified oil of turpentine and seven parts of benzine, with the addition of five drops of oil of verbena to each ounce. Its purifying and disinfecting properties are due to the power which is possessed by each of the ingredients, of absorbing atmospheric oxygen, and converting it into peroxide of hydrogen—a highly active oxidizing agent, and very similar in its nature to ozone. Articles of clothing, furniture, wall paper, carpeting, books, newspapers, letters, etc., may be perfectly saturated with it without receiving the slightest injury; and when it has been once freely applied to any rough or porous surface, its action will be persistent for an almost indefinite period. This may, at any time, be readily shown by pouring a few drops of a solution of iodide of potassium over the material which has been disinfected, when the peroxide of hydrogen which is being continually generated within it will quickly liberate the iodine from its combination with the potassium, and give rise to dark brown stains.—*British Medical Journal.*

MENDING BROKEN CASTINGS.—An ingenious method of mending broken castings is thus described: To insure its success, it is necessary that the parts to be reunited should be broken entirely across, so that the two parts shall be independent. It consists in heating the two pieces together by a stream of molten cast-iron until the surfaces of the fracture and the parts immediately adjacent to it commence to melt. Exactly at this point, the flow of cast-iron should be stopped, when the softened surfaces left behind will unite in chilling, and if the operation has been properly conducted, the new seam will be quite as strong as any other part of the piece. It is obvious, in addition to the precaution above named, that the melting should extend over the whole of the fractured surfaces, and that to prevent the actual running down of the pieces, the thickness of the casting must not be too small.—*National Car Builder.*

BEAUTIFUL BLACK COLOR FOR BRONZE.—A strong concentrated thin solution of nitrate of silver is required for this purpose. It should be mixed with an equal solution of nitrate of copper, and well shaken together. The pieces which require coloring are dipped into this solution and left for a short time. When taken out, they should be equally heated till the required black color makes its appearance.—*Scientific American.*

TO PRESERVE ICE.—To preserve small quantities of ice, it is recommended to tie a piece of coarse flannel on a suitably large vessel in such manner that the cloth forms a sack reaching down inside the vessel about halfway to the bottom. In this sack the pieces of ice are placed and well covered with flannel. It is good also to provide a constant exit for the water from the bottom of the vessl.

GOOD HEALTH.

Good Health.

The true significance of "good health" is comparatively unknown, or at least unappreciated to any but an invalid. To the latter it is a Utopian dream, much longed for and sighed for. "I would give all I am worth for health," says the unfortunate; but, alas! when well, "two bits" would be regarded as a high consideration. The fact is, we eat too much; if not too much, we eat in the wrong direction. We drink, smoke, work too much without regard to the strain upon our nervous organization. Neither physical or mental labor shortens life, on the contrary adds to life by working off the dead matter constantly cast aside in the laboratory of the system. But the food supply must be adequate and enough. Two men brought upon the tapis of business, attempt to play the game of the racing rival steamers on the Mississippi, "win the race, or burst," forgetting that either to win, or to burst, the supply of fuel must be proportionate to the amount of steam required. If we would drug less and eat more judiciously selected food, we would see less dyspepsia and other horrors. Everybody has an ailing, and everybody tries all the known and some unknown remedies to tone up with. The result is the stomach made to digest assimilating food, shrinks from the drug-store equipments lodged into it by its merciless owner, and gives up the ghost. Look at the drug stores on every corner, read the quack nostrums and specifics advertised everywhere, and imagine the feelings of a good-natured dyspeptic apparatus at the sight of its ultimate fate. Brillat Savarin lays down the rule, that properly cooked food in sufficient quantities; nay, large quantities, will drive away dyspepsia. The men who accomplish the greatest amount of physical or mental labor are the greatest eaters, they have to be, or nature would sink. We feed a horse in proportion to the work he has to do, but starve our own poor stomachs, and feel surprised that nature will not respond to our efforts. We say life is short and uncertain. Why, no! it is not necessarily so. If we contemplate suicide, of course we can tell to a minute, but otherwise we have the means of living and certainty of life within our grasp—in the observance of common sense rules as regards our food and its proper preparations. A man can be a genius on a diet of pork and beans, provided they agree with him, and that is just what we must all study: Learn what things agree with our stomachs, what climate best agrees with our lungs, what clothing best suits our comfort. Let everything else go, and work and eat to your heart's content, leaving death to Him who gave you life.

Milk and Lime Water in Nervous Disorders.

In a paper on "Milk with Lime Water as Food and Medicine in Nervous Disorders," presented by E. N. Chapman to the Medical Society of the State of New York, at its recent annual meeting, the author deprecates the warfare of drugs against disease which is now being waged by specialists more vigorously and systematically than ever before. Digestion and assimilation, he asserts, are ignored, and the attention is absorbed by one or more prominent symptoms in a part remote from the primary source of morbid action. Consequently the efforts of the physician to cure his patient are too often unavailing.

He states that having used, the last few years, milk with lime water almost exclusively as the diet of his patients, he has attained a success unknown to him when he depended more on medicine and less on food. To illustrate the ready assimilation, the nutritive quality and the remedial power of milk, when rendered digestible by lime, he presented notes of a number of cases treated by him, embracing a class involving the nerve centers, and that are acknowledged to be little under the command of accepted modes of treatment; such, for instance, as marasmus, anæmia, paralysis, indigestion, neuralgia, chorea, dementia, and alcoholism.

In concluding his paper, Dr. Chapman remarks that the efficacy of milk with lime water in the illustrative cases brought forward by him is equally observable in others whenever, either primarily or secondarily, the nutritive functions are much at fault. The milk (with a pinch of salt) being rendered very acceptable to the stomach by the lime, may almost always with advantage be made the prime article of diet in the sick room, however diverse the conditions. It is the most digestible and at the same time the most nourishing food that can be given. It allays gastric and intestinal irritability, offers a duly prepared chyle to the absorbents, supplies the blood with all the elements of nutrition, institutes healthful tissue changes, stimulates the secreting and excreting glands, and, in a word, provides nature with the material required to sustain herself in her contest with disease. If it be conceded that nature always accomplishes the cure whenever it is secured, and that drugs merely aid, direct, or modify her efforts to this end, it will be self-evident that the food which supplies the vital forces with all the power of resistance they possess is a matter of the first importance, and that milk acted upon by lime, provided it contains all the essential properties of other articles epitomized, and is more friendly than any or all of them, has a range of application almost as extensive as the disease itself, whatever its character and whoever the patient.

The Flesh of Diseased Cattle as Food.

Dr. E. Decroix, ex-Veterinary Surgeon-in-Chief of the French army, writes to the editor of the *Lancet*, *apropos* of the plague which is affecting the cattle of the English army in Afghanistan, as follows:

"Allow me to assert," he says, "that the flesh of animals affected with the 'cattle plague' may be eaten without fear and without endangering the health. In support of this assertion, I rely on a large number of observations that I have been collecting together for a long time, and especially on experiments that I have made myself. At Paris, from the 23d of February to the 8th of March, 1871, after the siege, the cattle plague existed among the oxen and cows collected at the abattoir of Villete as food for the public. Many of these animals, affected with the disease, were slaughtered for the meat market, yet no accident happened to the consumers. For my own part, I went to the slaughter-house during 15 or 20 days for the flesh of the animals that had died of the plague. I ate this boiled, stewed, roasted and in the form of soup, etc., during all that time without feeling the least illness from it. Moreover, I several times invited friends, especially veterinarians, who ate this meat with impunity. Desiring to carry my experiments still further, I ate the flesh raw, in order to remove the fears of those persons who might have been alarmed in learning that certain butchered animals had been afflicted with the plague. The soldiers of the army in Afghanistan may eat, then, the flesh of animals affected with this disease. There is no danger even in eating meat of animals that have died, but, for certain reasons, it is preferable to order the cattle slaughtered at the first symptoms of the disease. In the Crimea we allowed ourselves to go hungry, while many horses and sick beeves were lost. With more experience at the present time, I urge our brothers in arms of England to make use of the cattle affected with the disease under consideration; they will suffer no ill effects from it."

MINING AND SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

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The Week.

Accounts from every quarter show that the state of trade throughout the country is in a prosperous condition. This is shown particularly by Clearing House returns. Only New Haven and New Orleans show a decrease. Otherwise Eastern cities and San Francisco show considerable gain, and over the corresponding week of last year a gain of nearly 16%. Our mines certainly are not giving out. All industries must become stationary at certain periods of the year. At the present time the mining interests on this coast are awaiting in certain localities the solution of the problem attempted hy the Sutro tunnel, while other interests are repairing, replenishing or making preparations, so to speak, to take a fresh hold. Eastern capital continues to flow in upon our mining interests, and once having commenced, it will he difficult to stop or withdraw it. Heavy investments in Bodie stocks by prominent New York capitalists indicate a condition of the mining share atmosphere better than anything else. These capitalists are wise and not apt to act foolishly. So we must believe that our future will he prosperous. We must not forget, however, that capital is sensitive, and so let truthful accounts he returned of our interests. It will not do to overrate our condition, for then we would he working against future assured interests for the sake of a small temporary gain.

ENORMOUS ENGINEERING UNDERTAKING IN FRANCE.—The new French Minister of Public Works, M. de Freycinct, proposes a series of engineering works which effectually puts into the shade anything ever attempted on this continent. Even the Isthmus canal pales before this new project. So far as the amount of capital is involved, M. de Freycinct proposes to expend about $800,000,000 on a vast network of State railways and hydraulic works. His plans, which have almost all been sanctioned, comprise the maintenance of about 23,500 miles of national railways, not much more than half of which are at present in working order, and 5,000 miles of which have yet to he built, and the expenditure of $150,000,000 on new canals and old systems, and about $50,000,000 on the improvement and deepening of ports and harbors.

The Weather Bureau on the Pacific Coast.—No. 2.

In a preceding article we remarked briefly on the operations of the Signal Bureau in connection with the visit of Robert Craig, made not long since to this side of the Continent. This subject of coast meteorology was in that article partially gone over, covering the directions of the winds, movements of storm centers as belonging to helts of the globe, etc. It may here he remarked that the scientific generalization made for the first time in the meteorological history of the country, wherehy the trade-winds were connected with the revolution of the earth upon its axis, and all other winde were ehown to be hut modified effects from the same cause, was the beginning of practical weather science, and a discovery of the highest interest to the cause of learning and of prime importance in the practical affairs of life. By the lahors of the weather hureaus which are now estahlished in nearly all civilized countries, we are just heginning to realize the nature of the element in which we live, and learning how to adapt ourselves to it intelligently. Think of the salmon in the rivers as finding out for the first time the location of the rivers, or the nature of the currents in which they move. How many of the hape, heretofore all uncertainty, and charged to luck or ill luck, hamper agriculture, industry and trade, in their complicated affairs, whicb can yet be brought within the hounds of husiness calculation, through a little more knowledge of our atmospheric element. Health and pleasure, the delights of the season, and the convenience, safety and economy of locomotion hy sea, are all largely dependent upon knowledge which the Signal Bureau is placing within the reach of all.

Go west heyond the limits of the Oregon and California coast 1,000 miles, and the prevailing direction of the wind is from west to east. When it reaches the coast its lower stratum is deflected down the coast hy the trend of the mountains. A sailing vessel from the Sandwich Islands to California runs due north until it has passed from the tropical trade-winds into the temperate blowing in opposite directions.

Mention has already heen made of the fact that our storms travel from weet to east with the prevailing direction of the wind. It follows that in the tropical zone on the Pacific as on the Atlantic, storms rising to the south of us will travel in the opposite direction. To the grand curve of the Gulf of Mexico, whence storms are in the habit of passing over the United States and onward to Europe, we may have a counterpart on the Pacific. We are ignorant of the origin of the etorms which strike our coast. We do not understand why they sometimes etrike in the north, and at other timee in the south. With such problems as these the Signal Bureau is grappling with flattering prospects of suhstantial euccess. In the absence of telegraphic communication from the bosom of the Pacific, or heyond, they are making the best use of the eimultaneoue observations transmitted hy mail. When the Pacific cable is laid to the Sandwich Islands they will he in a position to tell us more ahout the weather for the henefit of shipping. The meager data now published hears no comparison to the fulness and preciseness of that we will enjoy when a sufficient number of stations have been estahlished to develop the system fairly.

Exceptional movements of storme are often brought about hy areas of high and low harometer at the north or south. A rain storm ahout 10 months ago took a grand eweep to the southward through Arizona, and thence in a northeasterly direction along the great lakes, following the usual couise heyond the Rocky mountains. If the deflection was caused hy atmospheric changes, it might have heen hrougbt ahout hy a high pressure due east of the storm center, therehy forcing the storm to move eoutheastward by way of Arizona.

In the latitude of Queen Charlotte island on the plateau of the Cordilleras, the writer, in Septemher, 1876, observed a great storm which moved in tbe normal direction at the commencement—from west to east, after a fall of nearly an inch of the mercury—hut after an hour or two of violent threatening with little rain it turned, apparently, upon itself, the clouds returned, and a terrific rain storm followed, the wind blowing westward. Lieut. Craig remarked that thie was prohahly a storm vortex similar to the cyclonee so often described, the position of the ohserver heing a little distance from the center. That etorm may have entered the United. States from the British possessions in the northwestern corner of Minnesota and followed the lakes.

Sometimes the Signal Bureau feels the commencement of a etorm in southern California, and it comes up over the center of California, moving thence in a northeasterly direction nearly to Montana, or even touching Montana before it resumes a more nearly due easterly course.

Storm centers, it may be ohserved, therefore, are at liherty to vary considerahly from the prevailing direction of the winds. This muet necessarily he the case where the storm center passes from the tropical zone to the temperate zone of regular or trade-winds, the prevailing directions heing opposite. In northwestern Alaska similar causes must hring ahont eimilar results. In the middle of the temperate zone the movements of the storms mentioned as passing from California through Arizona and Montana are examples of the influence of low and high pressure areas, which can be nnderstood hy reference to the published maps of the Signal Bureau. In the Rocky mountains storms are ohserved to move frequently from the northwest to the southeast. They come from British Columbia into Dakota. Further east they are seen to enter the populous Western States from Dakota, and sometimes from Minnesota, sweeping down over the United States in the direction of a low pressure area. The majority of the storms in the Eastern States come from the Rocky mountains, most of them striking for the region of the great lakes.

Some of these storms originate locally in the mountains or plains where the conditions arise. Those of sufficient sweep to cross the continent or the Rocky mountains, come from the Pacific—here. In regard to those that come into the United States from British America, the origin cannot be made out exactly at present, but the eupposition ie that they are developed in the Rocky mountains, unless they come from the Pacific ocean.

On the other side of the Rocky mountains the typical storms form in the neighhorhood of the equator, and move from southeast to northwest until they come to latitude 25 or 30 north, when they curve around to the eastward, describing a parabola.

In our firet article a storm was depicted as rising on the flanks of the Sierra Nevada—or the western rim of the plateau—and the clouds were described as rising into a colder stratum, causing deposition in the form of rain or snow. Let us follow it further: As the storm passes over the plateau, or the Rocky mountains, the harometric pressure is rather greater than hefore or after. This, at least, is the case so far as Old Prohabilities can tell hy the plotted data of the weather charts. In other words, the barometric readings vary there less from the mean than they do on this coast or to the eastward; and the rainfall is for that reason very much lighter in the Cordilleran plateau. It is not a desert merely because the Sierra Nevada has ahstracted all the moisture, hut because the barometric pressure is uniform, and there is no cause in operation to induce the moisture in the clouds to leave them.

The only explanation givcn by Craig for the dry summers of California is that they are due to the existence at that season of less moisture in the atmosphere; and what moisture there is, is not condensed in the latitude of California until the clouds reach the mountains, or higher ground, where they are forced into a cooler stratum of air. It is different in Mexico; and to some extent also in Oregon, Washington and British Columhia, though the tendency toward a dry spell in summer is felt until we reach Alaska.

The change of climate alleged to be taking place in Oregon and in Washington Territory, east of the Cascades, is not imaginary. Craig thinks there is something in it. A great deal has been written upon the suhject of inducing drynese or lessening rainfall hy cutting away the forests. But the suhject has heen superficially treated, and conclusions have been jumped at and crookedly etated, though they may in the main he correct. Treee and plants with peuetrating roots and ahundant shade have the effect to hold the moisture near the surface—drawing and keeping it there after it is once there hy capillary attraction, throughout seasons of drouth which would be severe enough to transform a dry country into a desert; but few plants could hold out through it. A country dotted or partially covered with moisture-holding vegetation would not only keep moist the intervening epaces where there is no forest, to a degree hy drawing the water from the depths to the surface hy sun power, but it would supply the atmosphere with moisture hy a constaut flow through the leaves, doing the duty of a thousand windmills. In that case the atmosphere would also hold more moisture than it otherwise could, and the usual causes might periodically precipitate it in the form of rain. Without the intervention of life at the surface the earth hecomes dry, reverting to its primeval condition hefore it had anything upon it that was heautiful. A crust is formed at the surface, and through that no moisture can escape into the atmosphere. Earth and sky are at odds with each other, heing equally forhidding. It is undouhtedly within the reach of mankind to take pieces of waste country where the rainfall is only from two to twelve inches, and cause the surface to hold the moisture so that the atmosphere can take it up from the natural reservoirs under the eurface. Douhtless the formations and the proximity to mountains holding ahundant moisture would have something to do with it.

So far, however, there has not heen sufficient artificial vegetation started in eastern Washington under the provisions of the Timher Culture act to hring ahout the phenomenon which is to he accounted for. It is only in the scutheastern corner, within a radius of 20 or 30 miles, in the Walla Walla distriot, where much has heen done in the shape of agricultural improvement and planting, though the area is very rapidly increasing.

As to the fact of an increased rainfall having taken place there during the past 20 years, although it is stoutly and circumstantially put forward hy everyhody residing in the district, observatione of rainfall for a decade at least should he taken hefore the fact can he said to he fully established. It is possihle that a cycle of greater rainfall may he again followed hy a cycle of dryness. The Signal Bureau has estahlished a station at the Dalles, and will establish otbers at Lewiston and Colville, or at Cœur d'Alene, wbich will develop the facts and furnish useful data for the flourishing farming country now in process of development through the inflowing of settlers and the construction of the Northern Pacific railroad.

We do not know of any other successful means heyond that above indicated for inducing artificial precipitation. Espy once tried to get an appropriation from Congress to make experiments by starting tremendons fires. Another experimenter in this direction wants to produce rain by firing cannon, on tbe principle of concussion. There can be no douht that if either of these parties could succeed in forcing the moisture-holding stratum of atmosphere up so ae to lower the temperature by the operation sufficiently to condeuse it into drops, the rain ought to come, and the experiments would be successful. Nor ie it beyond the bounde of human possihility that such operatione may yet he performed economically.

The Many Forms of California Mining.

Now that the mines of California are attracting increased attention, more especially in communities at a distance, we are frequently applied to by letter for advice as to the character of our mineral deposits, what may seem to be the most eligible localities in the State for engaging in the business, the amount of capital required for its succeesful prosecutiou, etc. In replyiug to these inquiries it muet be premised that only a very general answer can be given, because of the great extent and variety of our mineral resources and the lack of specific knowledge on our part as to the wants, means and other circumstances of the individual or parties applying for information. The precious metals occur here under such diversified forms and conditions as render a multiplicity of methode necessary for their successful mining, each of these methods being so unlike the other ae to constitute it an essentially different branch of the business.

Thus we have in Inyo and adjacent counties great quantities of argentiferous galena and other silver-bcaring ores that, requiring treatment hysmelting, opening here an extended field for those having experience in this mode of reduction. Then we have auriferoue quartz lodee carrying both free milling and refractory ores, and which, reaching along our main gold belt from one end of the State to the other, present grand opportunities for those having much as well as those having but little acquaintance with practical metallurgy, the exploitation of the veins above mentioned calling for the services of men expert at underground mining. The channels of the buried rivers and the banks of auriferous gravel overlying them afford material for extensive hydraulic operations, tbe former constituting also the sites of the drift diggings, now an important hranch of placer mining in California. The beds of the modern rivers in the mining regions of this State are filled for hundreds of miles with tailings, much of which can be readily rewashed and would well reward the operation. There are placee too along these streams that would pay well for wing-damming, with others that could he profitahly worked throngh tunnels or hy means of steam dredgers.

In the eourcee enumerated reposes mainly the mineral wealth of California, presenting to mining investors a wide and varied field from which to make choice. Not here as in most other countries are those proposing to become interested in mining for gold and silver confined to either one of the precioue metals, or to a single line of the business. It is possihle for them to largely consult their individual fitness, their convenience and tastes and the extent of their meane in emharking in this industry here, which in some of its departmente can he successfully carried on with very little capital. On the excellence of our climate and the superior facilities enjoyed here for prosecuting the husiness of mining we need not enlarge, these heing patent to all and everywhere well understood. Relying upon fresh intelligence derived through trustworthy channels, we will in our next issue try to indicate in a general way some of the districts in this State that eeem to invite the investment of capital, either through new discoveries made or the improved condition of mines previously opened and worked, calling attention also to some localities that offer inducemente for rewashing the tailiugs and inaugurating drift operations.

DEEP BORE.—The artesian well of Mr. J. B. Haggin, located about 13 miles northeast of Sacramento city, has heen discontinued after sinking 2,130 feet without any indications of flowing water. In the opinion of some geologists the stratifications of the main Sacramento valley dip to the east, and hence unfavorahle for a supply of artesian water. Debris, coarse gravel and quartz sand were found at and near the hottom. The quartz sand was submitted by us to a careful examination for gold, but not a trace was discovered. The indications are that the hore stopped in an ancient river hed, which perhaps may he regarded ae a fact, for ahout 100 feet from the sand deposit, the horer passed through an oak tree, which was in a perfect state of preservation. Between the oak tree and the sand a stratum of hydrogen gae was tapped. The gas hurned with a hlue flame. A singular circumstance, as hydrogen gas is rarely found in such localities. This well is on the Norris grant, and its progress has been noted from time to time in the PRESS.

Ancient Mine in Mexico.

Recent Discovery in Sinaloa.

We translate from *El Minero Mexicano* an account nf an important discovery. It appears that in the year 1830, Justo Contreras, an old man, over seventy years nf age, announced his discovery nf a rich treasure, without mentioning in what it consisted. The discovery was made somowhere near Point Huagino, in the mineral district of Cosala, State of Sinaloa, what is now known as "San Miguel de Huaginn." Don Francisco Alvarez and J. M. Chavez, to whom the information was given by Cnntreras, accompanied the latter to the locality of the supposed treasurs, but as considerable time had elapsed all traces were lost, or Contreras, in his senility, had forgotten them. He was accordingly disbelioved, but ho insisted and mado known his discovery to others, who were likewiso disappointed in their search. So the matter dropped.

Forty-eight years afterwards the matter was again called to the attention of the same parties by a cattle herder, who accidentally found a rich piece of ore containing gold and silver, in a ravins about three-fourths of a league southeast from Point Huagino. While looking for lost cattle, he noticed the glittering stone, and picking it up he brought it to Senor Chavez. Having located the place, Senor Chavez, accompanied by Don Quirino Navarrn, found the ancient Rancho "Brasil," near the same place where Contreras had declared his find, hut in an opposite direction. The ravine of the drover was easily found from this point, and after passing a cattle trough, and directiug their steps up the ravine towards the hrow of the hill they discovered the terrace of the ancient San Miguel mins. The vein of ths mine was also found, which was ascertained to run north and south. The ore found hy ths drover had apparently rolled down from the terrace into the ravine where it was found. This terrace, or plateau, is an artificial plane, with an incline of 60° and more than 200 yards in width and length, reof ths mine, which could not he traced from the ravins helow. Upon the plateau evidences of fire ahound, and the particles of gold and silver scattered over the surface of the ground, mixed with the coarss gravel which served as a matrix, and other evidsnces, afford indications of a rich dsposit which a practical miner would understaud and rarely mistake.

After careful inspection it was found that the ancient mine, though buried in debris, remained as it was left hy the ancient miners. Several excavations or shallow shafts wers found, all containing gold and silver gravel, which an expert pronounced rich in gold, even the low grade ore:

There are numerous traditions concerning this ancient mine, and so faint are the traces of the aucient mines that comparatively nothing will ever he known, uuless the mine itself should contain further evidences. It appears from this tradition that prohahly 200 years ago a rich mins was ones worked on a hill opposite Point Huagino and southeast therefrom. This hill was unknown as to location and had no name. It was eagerly sought hy treasure hunters who had learned that the mine proper had heen concealed hy timher, hut no trace of its entrance was ever ascertaiued.

All the old people of the Huagino were unanimous in the helief of the existence of the mine, and the tradition had come down from father to son for an unknowu period of time. Santiago Lahrado, an old man 118 years of ago, had heard his father say that his grandfather had spoken of this mine. Herders, in hunting their cattle, had fouud tracea of refining ovens on the Huagino Rancho in localities where tradition had fixed the residence of ancient owners of the mine. Quirino Navarro saya that when he huilt hia house he got the foundation stones from an ancient "casa grande," and that the stones contained evidences of gold and silver. These atones still exist. Many metallic instruments have heen disinterred, from time to time, near this "casa grande," hut have heen unfortunately lost or destroyed hy those who found them, not even the oldest inhabitant knowing their use. A large quantity of lime, debris or amalgam, aimilar to that taken from the Alcaparrosa mine, has been found near these old refining ovens, and judging from their weight they are heavily charged with lead. It ia said there was a mill, and, indeed, large atones, hurred like mill stones, still exist.

Considerahle lahor is heing expended to clean up the plateau, in order to uncover the entrance to the mine. The debris is so rich, howevor, and paying that the work is delayed hy extracting the gold and silver. The quantity of debris is immense, and extends over the plateau and partially fills the ravine. It is determined, however, to proceed with the work so as to uncover the timher-hidden entrance to the mine. That such a mine exists, and that it contains a vast treasure, there seems to he very little douht. It appears that years ago a sudden plague hroke out in this region which was so sadly destructive that the inhahitants had no other thought than to conceal their treasures and fly for their lives. From Sinaloa and Sonora the locality nf Huagino was the most suitahle, Guadalajara and Durangn heing too far distant, and tho highroads furthermore thronged with thieves. So it is extremely probahle that all the treasures were deposited here ; in fact romains of a highroad from Sinaloa and Souora to this point exist at the preseut day. Tho panic-stricken people either died, or, becoming unahle to return, their treasures remained unknown except to tradition. It was the panic which happened in 1834. Whou tho cholera first mado its appearanco in Sinaloa that revived the tradition concerning Huagino. Tho rocent panic having had ths samo effect as the aucient one, viz: tho desire of tho inhabitants to secreto their valuahles in somo common locality and fly for their lives from the dread disease. It is certain, at all events, that at some ancient period thers was a suddeu and violent flight of the people, and in the direction of Huagino. In the archives of Conitaca there are now documents wnich declare the fact of ths existence of this mine and that it was abandoned hy reason of the appearance of a desolating plague, and that ths miners, hefore abandoning their works, carefully concealed the entrance to the mine, leaving their furnaces, ovens, etc., as the least valuahle. Not far from the locality of the mine there is a largs plateau, or *mesa*, covered with cat-tail, among which numerous pieces of ancient pottery have been found in such situations as would indicate an encampment of a great multitude. The fact that the ancieut miners took such precautions to conceal all traces of the mine, thus indicating that to he the principal object of their solicitude, points induhitahly to the existence of a vast treasure within the mine. The veins so far are quartz and true fissure veins.

As soon as further developments are made they will he imparted to the public.

FIG. 1. GEYSER, SHOWING ORNAMENTAL CHARACTER OF BORDER.

Notes on Geysers.

Intimately connected with volcanic phenomena and in fact formiug subordinate volcanic pheuomena, geysers command ths attention and study nf the scientist, as well as excito tho wonder of ths ordinary heholder. Caused fnr soms important purpose in the ocouomy of nature, we should say vent holes for the relief of over-hurdened mother earth, tho true geyser should not ho mistaken for the fumaroles, the so-called geysors of California. Ths true geyser is found only iu Iceland, in ths Yellowstone Park of tho United States and in New Zealaud. Iceland is an essentially volcanic plateau, olevated about 2,000 feet above ths sea level, with only a narrow marginal hahitable region sloping gently to the sea. Upon this elevated plateau exists every sort of volcanic action, viz.: lava eruptions, solfataras, mud volcanoes, hot springs and geysers. These last exist in great numbers; more than 100 are found in a circle of two miles diameter. One of these, the Great Geyser, is well known to our readers.

In magnificence of geyser displays, Iceland is far surpassed hy ths geyser hasin of Firs-Hole river, in the Yellowstons region. This hasin is only ahout three miles wide. Around it are ahundant evidences of prodigious volcanic activity in former times, and secondary volcanic phenomena are developed at the present day on a stupendous scale, and of every variety. More than 10,000 vents of all kinds are found in this vicinity. On Gardiner's river, the hot springs are mostly lime depositing; on Fire-Hole river the geysers deposit silica, containing an enormous quantity of diatomaceous formations, some of them of a marine species mixed with all the varieties usually common to fresh water.

The geysers are generally surrounded hy hive-like elevations, ornamented in some cases in the most exquisite manner hy a snowy deposit from the hot geyser waters, in the form of scalloped embroidery set with pearly tubercles. The illustration in Fig. 1 will show the appearance of these surrounding dsposits.

In some places the silica is deposited iu large quantities, thres or four inches deep, in a gelatinous condition like starch pasto. Trunks and branches of trees immersed in these waters are sneedily petrified. The water of geysers is simple spring water, and they are true springs and not volcanoes. Mackenzie supposes that the eruptions are caused by the condensed steam of heated water seeking a vent and forcing the water up through tho geyser pipe, as in Fig. 2; *a* shows the opening into the geyser; *b*, ths chamber in which tho steam condenses. As tho steam accumulates it forces tho column, *c*, up through the opening or vent at *d*, with greater or less force, according as the supply of steam is greater or less, and then when the steam has escaped, the geyser returns to its quiescent state until another accumulation occurs. This theory, however, seems to he untenable on the ground that it is incouceivable that all of the many thousands of geysers should have a separate cone and conduits so peculiarly constructed. According to Bunsen, ths geyser does not possess a cave or even a perpendicular tube, ready mado, hut, like volcanoes, makes its own tubo.

Fig. 3 is an imaginary section of a geyser mound, showing tho manner in which, according to Bunsen's view, it is found.

The irregular line, *b, a, c*, is the original surface, and *a* the position of a hot spring. If the spring he not alkaline, it will remain an ordinary hot spring; but if it bs alkaline, it will hold silica in solutiou, and it will be deposited about tho spring. Thus tho mound and tubs are gradually huilt up. For a long time the spring will he *boiling*, but not eruptive. But as the tubs hecomes longer, aud ths circulation more and moro impeded, the differens in temperature between the upper and lower parts of the tube hecomes greater aud greater, until finally the boiling point is reached helow, while the watsr ahovo is comparatively cool. Then the eruption commences, and ceass upon the withdrawal of the cause.

Now, we supposs the geyser to havs a simple hut irregular tube, without a curve heated below hy volcanic fires, or hy still hot volcanic ejections. Now, the temperature of the water in the tube increases rapidly with the depth, hut is, at every depth to which observation extends, short of the hoiling poiut for that depth. Let abscisa *a d* represent depth iu the tube and also pressures, and tho corresponding temperature be measured on the ordinate *a n*. If, then, *a b, b c, c d*, represeut 33 feet depth, or one atmospheric pressure, the curve *e f*, passing through 210°, 250°, 275°, and 293°, would correctly represent the inercasing boiling points as we pass downward. This curvs may he called ths curve of hoiling point. The liue, *a g*, commeucing at the surfaces at 180° and gradually approaching the hoiling point line, would represent quiescence. Now, at the moment of eruptiou, at some poiut helow the reach of observation, ths line *a g* actually touches the line *e f*—that is, ths hoiling point for that depth is actually reached. As soon as this occurs, water in the lower portion of ths tuhe would he changed to steam, and its expansion would lift the whole column of water in the tubs, and cause it to hulge and overflow the hasin. As soon as the water overflowed, ths pressurs would hs diminished in every part of the tuhe; and a large quantity of water hefore very near the hoiling point would flash into steam and instantly eject the whole of the water remaining in the pipe. The steam itself would rush out immediately afterward.

The premonitory canuonading heneath is produced by the collapse of large steam hubbles rising through the cooler water of the upper port of tho tube; in other words, it is *simmering on a large scale*. An eruption is more quickly brought on hy throwing stones into the throat of the geyser, hecausc the circulation is thus more effectnally impeded.

Fig. 4 will illustrate this theory. The apparatus is an artificial geyser, and consists of a tuhe of tinned sheet-iron, about ten feet long, expanded into a dish ahove for catching the cruptcd water. It is heated also, a little helow the middle, by an encircling charcoal chauffer, to represent the point of nearest approach to tho hoiling point in the geyscr tube. When this apparatus is heated at the two points, aa showu in the figure, the phenomena of geyser eruption are completely reproduced; first, the violent explosive simmering, then the overflow, then the eruption, and then the state of quiescence.

Fig. 2.

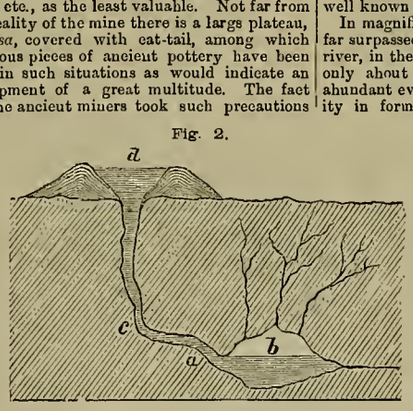


Fig. 3.

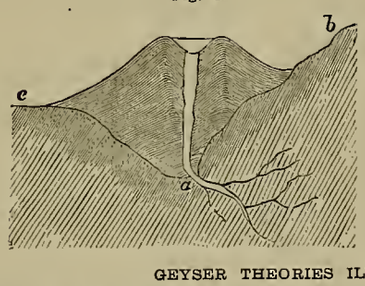
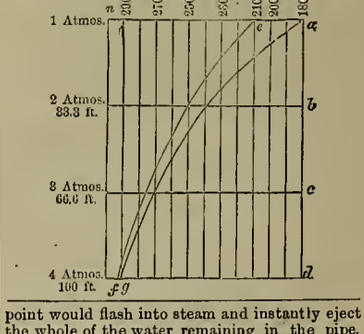


Fig. 4.

GEYSER THEORIES ILLUSTRATED.



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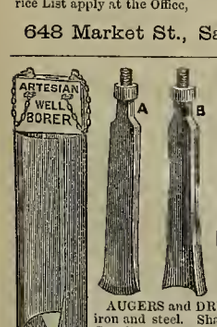

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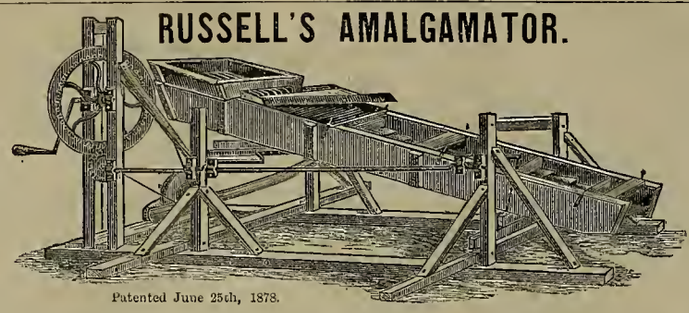

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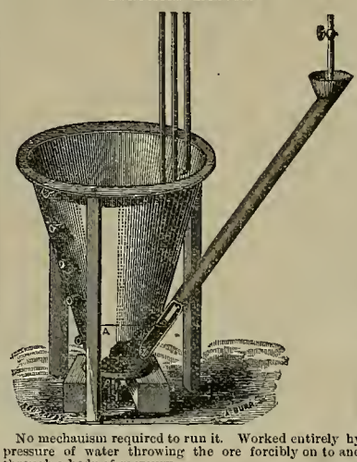

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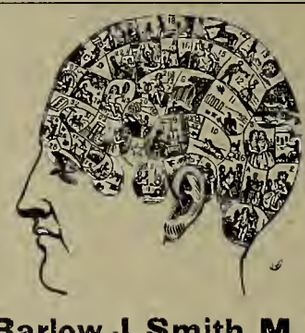

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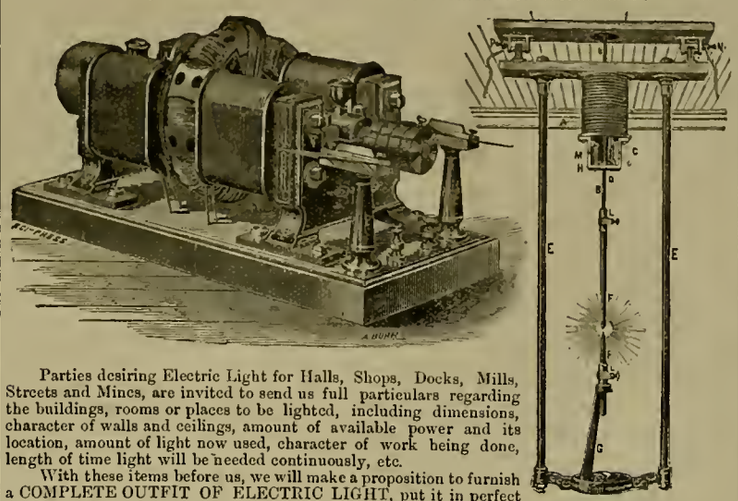

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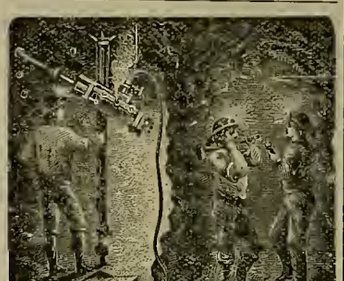

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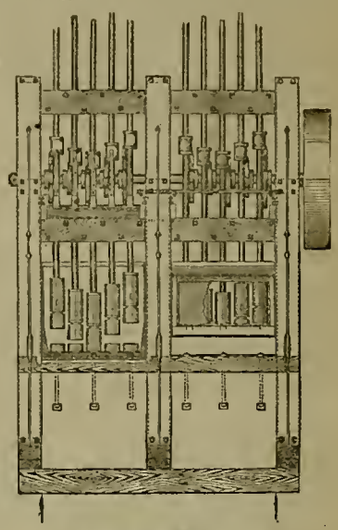

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Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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Plans and Specifications for Machinery furnished. Repairing promptly attended to.
110 & 112 Beale St., San Francisco.

THE IMPROVED O'HARRA
CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast
Forty Tons of Ore in Twenty-four Hours,
Giving a full chlorination (100%) at a cost of 30 cents per ton. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco.

Dewey & Co {202 Sansome St.} Patent Ag'ts

Continued from page 397.

in value, taken from third class ore, which is working 89% of the assay value. The company commenced on their low-grade ore, so as to fill up all chinks and cracks with low-grade pulp. The mill works beautifully in every particular. It is expected they will turn out $20,000 bullion per week, which will be shipped directly east.

CLIFTON.—The Longfellow mining company turns out 8,000 pounds of copper mattling per diem. New furnaces are being put up to treble the yield. A large business in charcoal is being done here. It is transported from the Burro mountains, a distance of 100 miles, and costs one and a half to two cents per pound delivered here. Eighteen tons of ore are daily put through the furnace. A railroad from the mine to the furnaces will be completed by January 1st.

FLORENCE.—One bar of silver, weighing 1,100 ounces, arrived to-day from the Isabella mine, Globe district.

COLORADO.

LEADVILLE.—Denver *Tribune*, June 11: The Pendery shaft is 200 ft deep, and the mineral thus far taken out is of high grade, and easily worked. A new ore and shaft house has just been completed, and hoisting is done by machinery. The ore bucket holds about 600 pounds, and a round trip from the top of the shaft to the bottom and return is made in about five minutes. Running to its full capacity this mine can turn out 75 tons of ore every 24 hours.

QUARTZVILLE.—Quartz creek, 27 miles from Gunnison, has developed mineral resources. Two miles north of town is the Terrible, supposed to be a true fissure vein between porphyry and limestone, carrying gold largely as well as silver and copper. The gold is visible. The Western Hemisphere, at the head of Hall's gulch, is a true fissure vein in place between porphyry and limestone. The ore carries silver, copper and lead, and is considered high grade—showing six ft of mineral. The Fairview and New Dollar, north, and the Red Jacket, south of town, are among the best developed leads in the district. Forty ft is the greatest depth attained on any; and the ore from Fairview is stripped as fast as taken out, paying expenses so far. The whole district is a mass of silurian, limestone and porphyry, overlying the granite, and near the summit north, against the granite, presenting the appearance of having been upheaved. The carbonate field is extensive.

IDAHO.

ROBERTSON PROCESS.—*Idaho Democrat*, June 11: We called at the Hoskins furnace and arastra the other day and found the boys busy roasting and crushing rock. The arastra is run by water power. The furnace is built of brick, and is similar to a baker's oven. They say the new process (Robertson) is working admirably and increases their rate of crushing at least one-half, besides enabling them to save all the gold. This company are first to put the Robertson process in operation in this Territory, and their success will cause others to follow suit. Their works are situated at the mouth of Robie gulch, about 12 miles from this city, and near the stage road connecting Boise and Idaho City.

BULLION valued at $3,573 arrived at Winnemucca from Silver City, Idaho, on the 5th.

IDAHO CITY.—There is an immense mass of debris along More creek which it is proposed to work up by fluming the creek and running the accumulated mass of tailings through into the canyons below. There is plenty of water and wood. The bottom or paying ground is from 300 to 2,000 ft wide, and the mass of tailings from 30 to 50 ft deep. There is an extent of hundreds of acres of the richest mining ground in the basin, and a depth of from 15 to 60 ft, all of which could be swept through this flume; besides, there are whole hillsides that could be piped in as the flume is extended. This would not be a temporary investment, but it would take a lifetime to run it all through and clean-up the immense area of bedrock, and the company who will invest and successfully carry out this grand enterprise will be able to count their gold by millions of dollars. There is another just such opportunity on Orimes creek.

BOISE CITY.—*Statesman*, June 12: There is no decrease in the excitement about the new ledges in the mountains near this place. Parties of prospectors are daily going out and returning with rich specimens of surface quartz; many reporting that they have discovered well-defined veins.

SUB ROSA MINE.—Idaho City *World*, June 10: The lessees of the Sub Rosa mine have 75 tons of ore in the ore house, and plenty more in sight.

MONTANA.

BUTTE.—*Miner*, June 10: In the main shaft of the Alice the rock, which has been very hard, is becoming softer, and better progress is reported. The shaft is now about 445 ft deep. At present rate of progress the point for starting the 500-ft cross drift will be reached early next month. The Penobscot mill, in the Stemple district, has been increased to 40 stamps, and 20 more, to raise the battery to 60 stamps, are on the way to Vestel. William Mayger is putting up a five-stamp silver mill, with power for another battery. It is located half a mile below Belmont, and just under the Drum Lummond lode, a 50-ft vein, carrying both gold and silver. The Colorado and Montana smelting company, through their Manager, Mr. H. Williams, have purchased of the Gagnon mining company the smelter erected by R. K. Williams & Co., on the flat across the creek from the Dexter mill. The furnace already built will be removed and another of suitable material and after a more improved plan put in its place. The building now standing will be increased by an addition 50x156 ft, with a shed 22x40 ft, premises of these dimensions being required by the furnace room, ore rooms, etc., of the works. To begin with, no refining works will be erected by the company; but instead, ore will be reduced only to matte. From 6 to 12 tons, according to its grade, will be reduced to one ton of matte, which, being ground and sacked, will then be shipped to the Blackhawk, Colorado works for final treatment. Sites, Fisher & Co. will start up an arastra within three miles of Beaver creek station (Rodgers'), and within a mile of the Radersburg road, some time next week. They own three lodes. On one that carries from 18 inches to 6 ft of ore, they have opened a tunnel 150 ft in length.

LEXINGTON.—A drift started from the lower level some two months ago, has been driven in on the north spur for the entire length of the ore chute, 116 ft as above. For this distance the spur has an average width of four and a half ft, and its ore, instead of yielding 70 or 80 ounces, as was expected, averages over 300 ounces of silver per ton, besides being rich in gold. Since visiting the mine we have been shown the records, kept in the office of Mr. M. E. Mayer, of assays make from north spur ore. From a long list we select six found in succession. Here they are: Three hundred and thirty-seven ounces of silver, and $31 gold per ton; 328 ounces, and $75; 148 ounces, and $100; 805 ounces, and $502; 1,080 ounces, and $286; 671 ounces, and $270.

NEW MEXICO.

LYONS' FOUNDRY.—*Grant County Herald*, May 24: Thomas Lyons' foundry, near the southern edge of town, has been running almost constantly during the past two or three weeks. The furnace is a brick cupola, with a capacity of about 5,000 pounds of molten iron for each day's run. The blast is furnished by a No. 9 Sturtevant blower, run by an eight-horse power engine. The fuel is oak charcoal. The foundry is specially fitted for the casting and turning of stamp-heads, tapits, cams and every class of quartz mill attachments requiring heavy boring. A fine quality of molding sand is found in the arroyo just below the foundry. Mr. Lyons is prepared to turn out any description of casting from 1,500 pounds in weight down to the most minute article required in the machinery of a quartz mill. The patterns for the foundry are manufactured by Black & Cosgrove. The foundry is now being run upon such scraps of iron as can be gathered from occasional sales of that material; but if proper encouragement is given, Mr. Lyons will erect a blast furnace, and commence the reduction of iron ore. His mine, near Santa Rita, shows a heavy body of magnetic ore, running at least 60%, and he feels confident that this ore will return a very superior quality of pig iron. He now charges 15 cents per pound for his castings, but if the quartz mills of Silver City would patronize him, this price would be greatly reduced. Connected with the foundry is a patent brick press, for the manufacture of fire bricks. The clay is brought from the hills just above the Mimbres reduction works, and the brick will stand more than four times the amount of heat, in a cupola lining, than the St. Louis extra fire brick will stand. This by actual test of four and five days' run.

ITEMS.—Miners about Lone mountain are pushing work upon their leads, and the most of them have a splendid showing of ore. The Lone Mountain mill is now running on a batch (eight tons) of ore from the Commercial, sent in by George Smith. The ore assays, on an average, 250 ounces to the ton, and Holson can be relied upon to work it close.

UTAH.

ITEMS.—Salt Lake *Tribune*, June 12: Yesterday Wells, Fargo & Co. sold one car of Horn Silver bullion for $1,613.50, and shipped to Chicago two cars, valued at $4,000. On the 9th and 10th, Warnock & Co. received 89,506 pounds of Horn Silver bullion. The Union Pacific Express Co. yesterday received four bars of bullion from the Ontario, valued at $3,179.75; four bars from Leeds, $4,773.39; four bars from the Ontario, $3,398.38; total, $8,171.77.

International Meteorological Congress.

The International Meteorological Congress, recently convened at Rome, terminated its labors after a brief and rather hurried session, by referring much of the business for which it was convened, to the discretion of a committee originated by the Congress; the decisions of the Congress itself have not been therefore numerous. The meeting was large with quite a general enthusiasm on the subject of international meteorology.

The Congress has recommended that for each country daily synoptic weather charts be made for study, as has been the daily practice for the United States since 1870; that storm tracks should be traced; weather notices given to farmers; winds, temperatures, etc., studied by the month and by the year; instruments at all stations compared with each other; the general march of weather phenomena over the surface of the globe noted; uniformity of observation sought for, and other procedures, as has been long the customary plan on this side of the Atlantic. There are evidences of progress in this.

On the subject of observations actually simultaneous, first originated and practically put in use by the United States in 1870, and the basis of observation on which the greatest advances and success have been made by this country, it was resolved "that the Congress is of the opinion that the development of simultaneous observations contributes much to the progress of meteorology, and that all works which are undertaken in this direction, ought to be encouraged."

The publications of the Signal Office, such as the Monthly Weather Review with the Synoptic and International Weather Charts were referred to with approval, and with the recommendation, "that the Congress is of opinion that the publication of a similar Review would contribute much to the advancement of meteorological study, and is therefore recommended to be made for Europe." There can be no higher compliment.

Finally, the Congress asks that the stations, as Mount Washington and Pike's Peak (the highest stations on the earth), may be maintained, making even more observations than those now attempted, and that all the observations may be published for the use of all meteorologists everywhere, as an approval of those stations, the utility of which was once questioned.

It is on these points only the acts of the Congress have any special reference to the meteorological work of the United States. It is satisfactory to notice so much of approval and adoption, and so general a wish for the continuance and extension of it. The Congress made no practical suggestions as to weather predictions in Europe, a matter which, it would seem, might have been arranged with very little difficulty.

HOT AIR, OR HAMMAM.—It has been shown experimentally that hot air is a cure for lung diseases, at least in their incipiency. The theory of it is that the heated atmosphere breathed into the lungs cicatrizes the lacerated or diseased tissues and effects a permanent cure. In view of the fact that lung and throat diseases prevail here as well as elsewhere, it is well worth an experiment, even if the result should be only a re-invigorating of the system. For the general health this experiment may be tried in the Turkish bath. *Hammam*, or hot air, in combination with cold air, warm and cold water, motion, friction, and electricity, as practiced by Dr. A. M. Loryea, at his splendid bathing establishment, Nos. 11 and 13 Dupont street, is entitled to more than a passing notice. Whoever benefits suffering humanity is entitled to some regard, even if a small pecuniary compensation is required, and in this respect we mention the Hammam baths. The most perfect order and cleanliness exists, and an air of refinement and luxury pervades even the atmosphere of the rooms, so that the most delicate organization need not fear any rude shocks. The physical system, through the instrumentality of the baths, receives so thorough a renovation that it is scarcely credible so simple a treatment can produce so wonderful an effect. It would require columns of interesting matter to describe the mode of operation and results, but suffice it to say that no one who receives the treatment once will find it necessary to undergo any other treatment. We do not of course claim a miracle in the healing art, although the general toning up of the system and delicate lung and other tissues of the body borders upon the miraculous.

Electricity in Harness.

A correspondent writing to the *Petit Journal* from Sermaize (Marne), France, May 15th, says: "A complete revolution is about to occur in mechanical industry, and the great problem of electricity as a motor is henceforth solved beyond a doubt. Every day experiences in electrical manipulations demonstrate perfect success in the use of electricity as a motive power. The proprietors of the sugar refinery of Sermaize have, after many trials, succeeded in unloading their beet barges by means of an elevator worked by electricity, 100 meters distant from their factory. The pulper of the refinery receives its motive power from the same source. It is astonishing to witness the working of machinery without visible power, and two small wires conducting the electricity 700 meters the sole explanation of the cause. The success of the experiment has decided the proprietors to adapt the same system to their entire works. By means of a steel cable a power equal to eight oxen will be generated. Many spectators, curious and scientific, visit the works from other departments, and express the utmost astonishment at the novelty."

Now, in view of the fact that one pound of zinc costs ten times as much as a pound of coal, in other words, as any magnetic motor will he 60 times as expensive as a steam motor of the same horse power, it is difficult to perceive how this French invention will succeed in point of expense. There is no better agent than zinc for producing electricity in batteries. Then, too, the modern dynamo-electric machine, while affording another source of magnetism, requires a powerful steam engine to run it; more powerful, indeed, than the effect sought to be produced. The writer promises further developments, and we certainly await them with considerable anxiety. We know, however, that economy is the great desideratum with French manufacturers, and hence, if the motor is adopted successfully, as it appears to be, we will confess that all of our calculations have been wrong, and that we know nothing at all about magnetic motors.

New Double-Acting Deep Well Pump.

Messrs. Thompson & Evans have lately devised a new steam pump, and practically illustrated its perfect working qualities in that built by them for the Hammam baths, and now in constant use by that establishment to draw water from an artesian well. It is a double-acting force pump, and a direct-acting engine, with yoke and sliding block attached to crank, and is automatic in its workings. Capable of from 20 to 150 revolutions per minute, it draws and forces a three-inch stream of water 120 feet, and at moderate speed will supply 5,000 gallons of water per hour. In conversation with the engineer at the Baths, he declared that a steam pump cannot be manufactured that will work easier and quieter, and a personal observation justified his assertion, as it works very silently and regularly.

This pump will run to its full capacity on 35 pounds of steam, and it can be regulated at any rate of speed and is much smaller than a steam pump formerly used at the Baths, which required from 70 to 100 pounds of steam to do the same amount of work. It is settled that 20 pounds of coal per hour will run the pump to its full capacity. The special feature of this steam pump is its double-acting water cylinder, arranged to be placed in a deep well. The one at the Baths to which we refer, has its water cylinder at a depth of 80 feet in the well. Several others of the same type are now being made. The same firm have manufactured a small and cheap engine of from one to seven-horse power, especially for the use of farmers and general work of all kinds, occupying small space and doing a large amount of work on as small a consumption of fuel as possible. A small size engine of this latter kind can be set up complete for $75, or at $50 per horse power.

ARTESIAN WELLS.—William Stack, of Oakland, has lately completed an artesian well adjoining his store, on the northeast corner of Fifth and Harrison streets. The well is an eight-inch bore in the clear, and 113 feet deep. The water, of which there is an abundant supply, rises to within six feet eight inches of the surface. Mr. Stack has several tenement buildings in the vicinity of the well, and his enterprise is calculated to give an abundant supply of good water; most decidedly in favorable contrast with the mere surface supply provided by the San Francisco and Oakland water companies. The formation is as follows: Surface soil, 6 feet; hardpan, 40 feet; blue clay, 62 feet; fine water gravel, 5 feet; total, 113 feet. About four feet above the gravel, the borer passed a stratum of what were supposed to be oyster shells. We cannot commend too highly an enterprise of this kind. In a region where the water supply from subterranean sources is so abundant and so pure, the public demand, and will have, water that is drawn from sources not exposed to contamination. Public and private health requires it, and the increase of the knowledge of health requirements will override the desire for profit at the expense of health and comfort.

News in Brief.

PARADISE VALLEY hogs are fattening on grasshoppers.

GUAYMAS wants San Francisco to let it be a rival port. Go ahead.

YANKEE FORK is making heavy drafts on Nevada. Too many tines on that fork.

THE tunnel under the Detroit river will be completed within two years, and will cost about $1,500,000.

SEVEN bridges on the Warsaw and Vienna railway have been carried away by floods. Traffic is interrupted.

It is said that hay will be worth $75 per ton in Austin, Nevada, next winter. Meat and potatoes would be a cheaper diet.

THE Hungarian General Turr, initiatory of the Panama canal scheme, will probably accompany De Lesseps to Panama.

THERE should be more uniformity in wages. The wages of sin are death, while the wages of Tom Scott, as railroad president, are $100,000 per annum.

THE Guadalupe ranch and the surrounding locality in Lower California was burned over a few days ago, destroying thousands of acres of feed.

THE weather in New York has been very cold and the signal officer predicts it will be still colder, with frequent frosts throughout the Middle States.

THE beach at Galveston, Texas, is the largest and broadest in the world, extending 25 miles, fronting the unbroken tide of the Gulf of Mexico on the south and east.

CORK is coming into use in Germany as a filling for winter bed-coverlets in place of feathers. It is described as not only being warmer and lighter, but decidedly cheaper.

A CYCLONE passed over Sandersville, Ga., June 12th. The Catholic church and many trees were blown down, and fencing and crops sustained considerable damage. No lives lost.

THE New York *Evening Post's* financial article says: The fever for mining stock venture is rising, notwithstanding the profits of mining are collectively not so large as the profits of agriculture.

A VIOLENT storm, accompanied by hail, passed over the city of Trenton, N. J., at 5:30 P. M., June 12th, uprooting trees and doing considerable damage. A washout occurred on the Pennsylvania railroad, delaying trains for a while.

NORTH ADAMS, Mass., has been visited by a heavy freshet, and the damage throughout the vicinity is variously estimated at from $100,000 to $150,000. Damages by the flood in the outlying districts are hourly reported.

THE whole number of languages spoken in the world amounts to 2,553; 587 of these are spoken in Europe, 396 in Asia, 276 in Africa and 1,264 in America. The inhabitants of the globe profess more than 1,000 different religions.

A TERRIFIC storm passed over Bordentown, N. J., June 12th. The rain fell in torrents, accompanied by wind and hail. Trees were uprooted, roofs carried away and several buildings blown down. A mile below the storm was not felt.

CONTINUED shocks of earthquake, which are attributed to the action of Mt. Etna, have occurred near Santa Venere and Guardia, Calabria Citra. Several houses have fallen. Others are in danger of falling, and there has been some loss of life.

OREGON thinks the heavy rain of the 6th was a curse, while Humboldt county sings "thankfulness to the Lord" for a glorious shower; Tuolumne had 23 inches of rain, and Amador county declares rain on Tuesday and a thunder storm on Wednesday very peculiar weather at this season of the year.

THE *Commercial* this evening says the Panama route will not be satisfactory to merchants of New York doing business with China and Japan. By overland connection, the cargo, consisting of teas, silks, etc., only broke bulk once before reaching New York, and that was at San Francisco. Besides loss of time, the deterioration of merchandise by transfer to a tropical climate is urged as a reason why merchants are unwilling to return to the Panama route, and many would choose in preference the Suez canal route, thereby throwing the carrying trade into British hands; the difference of time being made up by the advantages of maintaining bulk and the prevention of sweating.

DO NOT PUT OFF.—It is a fact that should be known to our patrons, and if known is frequently overlooked in the hurry of personal affairs, and that is our agents map out their routes so as to be able to visit every locality systematically. And hence when they are compelled to "double" as it were on their collecting routes, their labors become very arduous. We would be glad if every one would be ready to settle with them at first sight. The circulation of the paper is large, and our numerous subscribers scattered far and near, and as we must look to expense in order to produce as good a paper as we endeavor to do, our patrons should assist us in our endeavors by promptly settling with our agents, not putting them off as if they had but one single collection to make, or traveled about with electric speed.

THE total coinage of the several Government mints during the month of May amounted to $5,213,258, of which $2,878.550 were in double and quarter eagles, $2,330,000 in silver dollars and $4,708 in five-cent, three-cent and one-cent pieces.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports to DEWEY & CO.'S Mining and Scientific Press Patent Agency.]

By Special Dispatch from Washington. D. C

For the Week Ending June 10th, 1879.

216,303.—Lubricator—D. P. Baldwin, S. F.

216,308.—Machine for Reducing Coin-Blanks—F. X. Cicott, S. F.

216,313.—Elevator—F. J. Cronch, Eugene City, Ogn.

216,325.—Mining Flume—J. Howe and N. Waite, Shasta, Cal.

216,326.—Hydraulic Lift—W. B. Hyde, Oakland, Cal.

216,270.—Vehicle Wheel—L. B. Lawrence, Monticello, Cal.

216,338.—Sectional Nut and Collar—E. M. Morgan, Santa Cruz, Cal.

216,151.—Steam Packing—Geo. P. Phillips, Gold Hill, Nevada.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

In New York the contract by which the Fuller Electrical Co. engages to supply the electric light to Madison Square Garden, for a term of months, has just been signed, and the project will be put in execution immediatcly. The garden will be lighted by means of four lamps, 2,500 candle power, for three and a half hours per uight, at a cost of ahout eight dollars to the proprictor of the placc. This is, in the absence of exact calculations, estimated to be from one-third to one-fourth the present cost of lighting the garden hy gas.

Every new subscriber who does not rceive the paper and every old subscriber not credited on the label within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect us and subscribers against the acts and mistakes of others.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
B. W. Crowell—California.
A. O. Knox—Pacific Coast.
S. V. Blakeslee—State of Nevada.
G. W. McGrew.—Santa Clara county.
Milton Kennedy.—Korn and Inyo counties.
J. B. Bachelder.—Shasta County, Cal.
H. H. Messenger—Arizona.
J. H. Wheeler—Mono county, Cal.

Fresh attractione are constantly added to Woodward's Gardens, among which is Prof. Grubor's great educator, the Zoographicon. Each department increases daily, and the Pavilion performancee are more popular than ever. All new noveltiee find a place at this wonderful resort. Prices remain as usual.

How to Stop this Paper.—It is not a herculean task to stop thie paper. Notify the publishers by letter. If it comee beyond the time decired you can depend upon it we do not know that the subscriber wants it stopped. So be eure and send us notice by *letter*.

Settlers and others wishing good farming lands for eure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who hae some 15,000 acree for salo in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Sample Copies.—Occasionally we eend copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending ite circulation. We call the attention of each to our prospectus and terms of subscription, and requeet that they circulate the copy sent.

Extra Copies can usually he had of each issuc of tbie paper, if ordered early. Price, 10 cents, postpaid.

Printer's Proof Press, complete and in good working order, for sale at this office, at the low price of $30. Call and see it.

Experimental Machinery, drawings, patterne, models, all kinde of electrical and telegraphic apparatue to order. See ad. F. W. Fuller, 415 Market St., eccond floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

LUMBER.

Wednesday M., June 18, 1879.

CARGO PRICES OF REDWOOD.		PUGET SOUND PINE RETAIL PRICE.	
Rough, M.	13 00	Rough, M.	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	13 00	Lathe	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	**REDWOOD.** RETAIL PRICE.	
Flooring	20 00	Rough, M.	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shinglee	1 75	Shingles M.	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, June 18, 3 P. M.

Silver, 62¼@40.
Gold Bars, 830@830. Silver Bars, 8@19 ₱ cent. discount.
Exchange on New York, 20, on London bankers, 494@494. Commercial, 50; Paris, five francs ₱ dollar; Mexican dollars, 92@97.
London Consols, 97 1-16; Bonds (4%), 105.
Quicksilver in S. F., by the flask, ₱ lb, 36c.

METALS.

[Wholesale.

Wednesday M., June 18, 1879.

Iron.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3¼
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
Copper.—	
Sheathing, ₱	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @ —
Steel.—	
English Cast, ₱	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, ₱, less than cask	9½@— 10
Nails.—	
Assorted sizes	2 90@3 00

Signal Service Meteorological Report.

San Francisco.—Week ending June 17, 1879.

Highest and Lowest Barometer.

June 11	June 12	June 13	June 14	June 15	June 16	June 17
29.860	29.040	29.069	29.027	29.863	30.031	29.980
29.814	29.878	29.017	29.836	29.824	29.062	29.909

Maximum and Minimum Thermometer.

65	65	70	70	63	68	67
53	54	51	54	53	52	53.5

Mean Daily Humidity.

73	70.3	71.3	71	67	60.3	65

Prevailing Wind.

W	W	W	W	W	W	W

Wind—Miles Traveled.

180	215	203	204	350	291	227

State of Weather.

Clear.	Clear.	Clear.	Clear.	Clear.	Fair.	Clear.

Rainfall in Twenty-four Hours.

Total rain during the seaeon. from July 1, 1878, 24.44 in.

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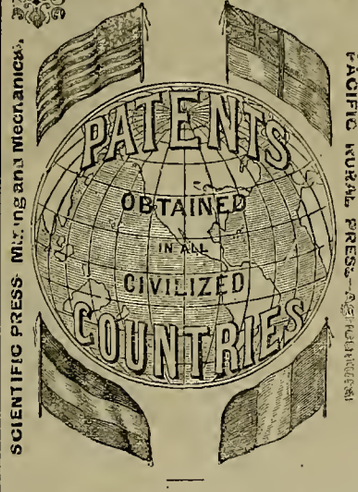

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Any stock upon which said assessment shall remain unpaid on Tuesday, the first day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the eleventh day of August, 1879, to pay the delinquent assessment, together with cost of advertising and expens of sale. By order of the Board of Trustees. W. D. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal.

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Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of June, 1879, an assessment (No. 1) of Three Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 324 Montgomery St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 21st day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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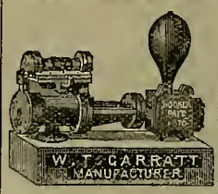

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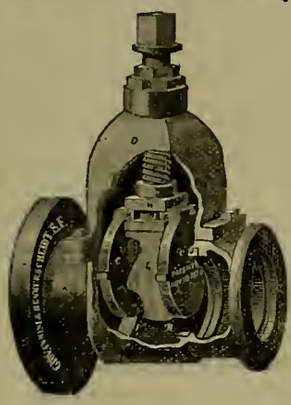

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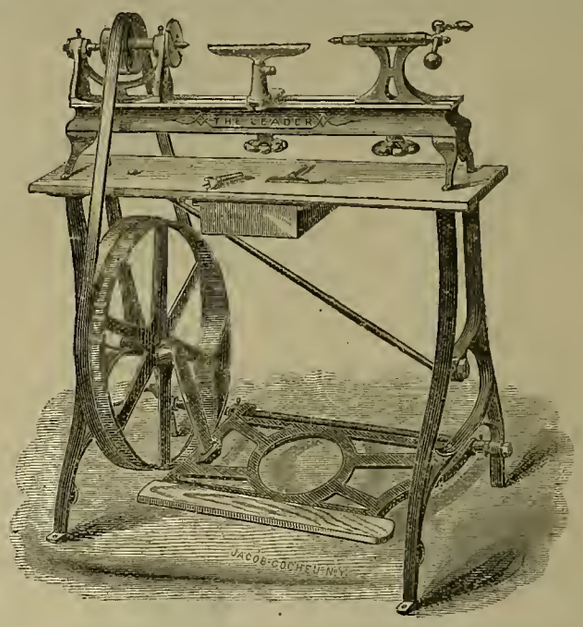

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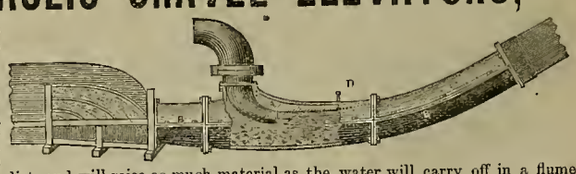

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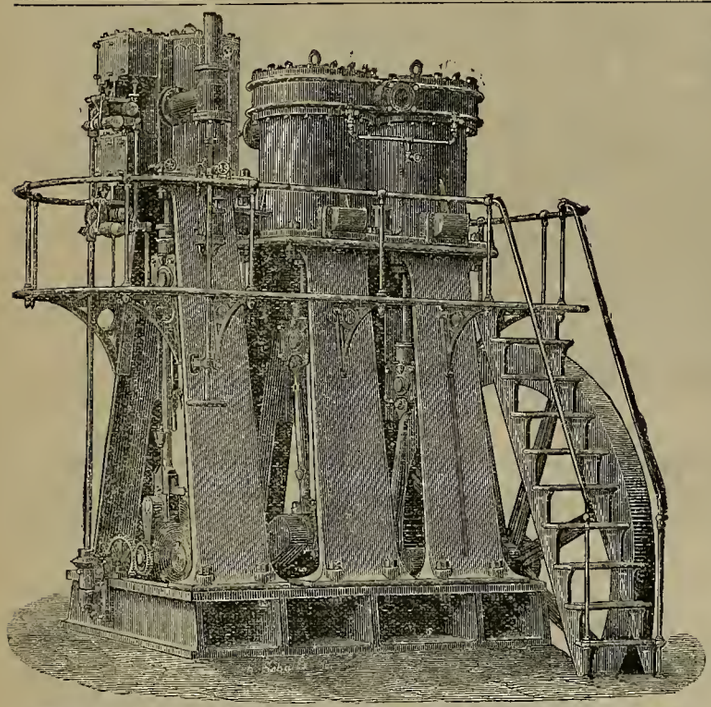

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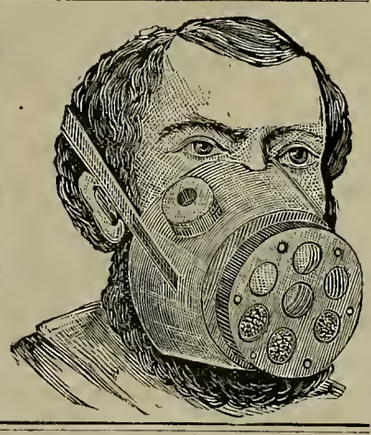

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

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Earthquakes.—No. 1.

The late eruption of Mount Etna, the present disturbed condition of Vesuvius, and the quite recent earth tremors perceived on our coast, afford an occasion for calling attention to the subject of earthquakes and their explanation, effects, etc.

It has been through the labors of Robert Mallet, of England, that this subject has assumed a scientific shape, and its importance, with a view to avoid the direful effects of Nature's throes, cannot be over-estimated in this utilitarian age.

The great complexity of earthquake phenomena, and their secret origin deep within the bowels of the earth, have produced during all ages so much surprise and alarm, that the human mind has been unfitted for scientific observations. Until twenty years ago the state of knowledge on this subject was much the same as it was 2,000 years ago. Yet, in the short period of twenty years, our knowledge of earthquakes is even greater than that of volcanoes.

Mallet has collected the records of 6,830 earthquakes as occurring in 3,456 years previous to 1850, but of that number 3,240 occurred in the last fifty years; not because they are becoming more numerous, but because the records are more perfect. Taking the last four years of Mallet's record, the number of earthquakes was about two a week. Alexis Perry, in a more complete record from 1843 to 1872, inclusive, mentions 17,249 or 575 per annum. It would seem probable, that as the larger number of earthquakes are not even now recorded, because they occur in mid ocean or uncivilized regions, the earth is *constantly quaking* in some portion of its surface.

It cannot be doubted that a close connection exists between earthquakes and volcanoes. Explosive volcanic eruptions are always preceded and accompanied by earthquakes, and earthquake shocks which have continued to trouble a particular region for a long time, suddenly cease when an outburst occurs in a neighboring volcano, showing that the latter are safety-vents for the interior forces which produce earthquakes.

According to the present well-sustained theory of the molten or plastic condition of our inner earth, and the consequent supernatant condition of the earth's crust, earthquakes are intimately connected with the bodily movements of great areas of the earth's crust, by elevation or depression, and hence it happens that earthquakes occur with great violence in regions very remote from volcanoes. It should always be born in mind that volcanoes are not the causes of earthquakes, but that a volcano may be created by an earthquake. In order to simplify the idea sought to be impressed upon the mind, we have only to imagine that the earth's crust is not a continuous mass in which there is no break, but it is a broken up and irregular crust of inorganic matter, supported by and subject to the movements of the igneous, molten matter upon which it floats. We could give many instances of regions being depressed or elevated, but we refer only to the mountain in Georgia, which is now gradually sinking. In fact, the crust of the earth is in continual movement by elevation or depression almost everywhere. Partaking on a large scale of the same motion perceived in a ship on the ocean swayed by the constant swell of the waves, this motion is the *remote* cause of earthquakes, while the proximate cause of the observed effects of the earthquake is the arrival of a shock or earth-jar, a sudden interference, as it were, with the oscillation of the earth's crust.

To more clearly illustrate our meaning, we are compelled to allude to some of the principles concerning waves. As to their propagation, waves are either of gravity or of elasticity; as to direction, they are either transverse or longitudinal; and as to form, may be regarded as circular or spherical.

Gravity and circular waves are always of transverse vibration; spherical waves are of longitudinal vibration, while waves of elasticity are either longitudinal or transverse. It is, however, principally of elastic longitudinal waves that we shall speak, and state as a principle that all waves propagated from a point within a medium such as sound waves, are elastic spherical waves of longitudinal oscillation. The sense in which they are used is illustrated in Fig. 1. The bar, *A, B*, represents a prism cut from a vibrating sphere in the direction of the radius, and the light and dark portions represent condensation and rarefaction. Now, on the line *a, b*, representing the natural state of the bar, draw ordinates *above* to represent the degrees of compression, and below to represent degrees of rarefaction; then the undulating line will correctly represent the state of the bar during the transmission of elastic longitudinal waves. The compressed portions are called crests, and the most rarefied troughs as in transverse waves, such as ocean waves. From crest to crest is the length, and the amount of oscillation of the particles back and forth in compression and rarefaction is the hight of the wave. The *velocity* of *water-waves* depends wholly upon the *wave-length*, while the velocity of *elastic* or earthquake waves depends wholly upon the *elasticity of the medium*. Thus the harmony of a full hand of music is perfect even at a great distance, because all the sounds whether loud or soft run with the same velocity, and the only difference in earth-waves is that when the medium is not uniformly elastic, and the waves or vibrations are high, the medium is *broken* by the passage of the waves, elasticity is diminished, and the waves *retarded*.

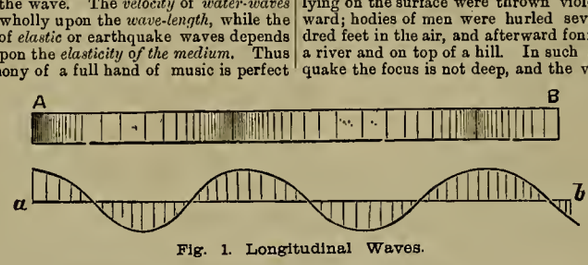

Fig. 1. Longitudinal Waves.

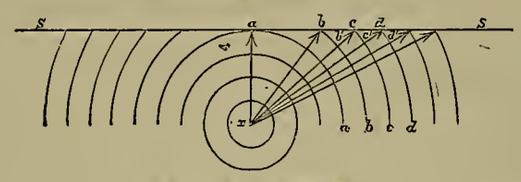

Fig. 2. Surface Waves.

Fig. 3. Reflected Waves.

Fig. 4. Wave Outcrop.

THEORY OF EARTHQUAKE WAVES ILLUSTRATED.

Let us suppose a concussion or explosion of any kind to occur at a considerable depth (*x*, Fig. 2), say 20 miles beneath the earth-surface, *S, S*, a series of elastic spherical waves will be generated, expanding with great rapidity in all directions until they reach the surface at *a*. From this point of first emergence the still enlarging waves would outcrop in rapidly expanding waves, which we call the *surface-waves*, as shown in Fig. 2 at *a, b, c, d*, etc. This surface-wave would not be a normal wave. It would be only the outcropping or emergence of the ever-wideuing spherical-wave on the earth-surface. Both its velocity of transit along the surface, and the direction of its vibration in relation to the surface, will vary constantly.

It will be readily understood that the earth-waves do not cease at the surface, but continue through the lighter medium, the air which surrounds and is a part of the earth. They may, and it is probable that they do continue to the outer limit of the atmosphere until they again meet and become infinity. We know their action up to and at the point of emergence at the earth's surface, beyond that, is debatable, experimental ground. Mallet determined experimentally the velocity of elastic earth-waves by exploding a barrel of gunpowder buried in the earth at a known distance, and noting the difference between the instant of explosion and the arrival of the earth tremor, and it was also observed in the Hell Gate explosion in New York harbor. In sand the velocity was found to be 825 feet; in slate, 1,225 feet, and in granite 1,665 feet per second or 19 miles per minute.

As to their effects, earthquakes are generally divided into three kinds, viz: the explosive, the horizontally progressive and the vorticose. In the first a violent motion directly upward breaks up the earth crust, and bodies on the surface are thrown high in the air. The shock is violent but does not extend to any great distance. It was an earthquake of this kind which destroyed Riobamba in 1797. The shock came suddenly, like the explosion of a mine, the earth was broken up and rent asunder, and objects lying on the surface were thrown violently upward; bodies of men were hurled several hundred feet in the air, and afterward found across a river and on top of a hill. In such an earthquake the focus is not deep, and the velocity of the wave or shock is not impeded before it emerges.

The *vorticose* earthquake causes a whirling motion of the earth, entirely different from ordinary wave-motion, the three kinds, although seemingly essentially distinct and possibly produced by different causes, only differ from each other on account of the different conditions under which the waves emerge on the surface. The causes are the same but the variations of the medium produce variable results as to visible characteristics.

The *horizontally progressive* may be regarded as the true type of an earthquake, and is the spreading surface wave delineated in Fig. 2, at *a, b, c, d*, etc. These quakes usually run along mountain chains, which generally consist of a granite axis, flanked on each side with stratified rocks of many different kinds. When elastic waves pass from one medium to another of elasticity, a part of the waves passes through, but a part is always reflected. For every layer a reflection occurs; and hence, if there are many such layers, the waves are quickly quenched. In Fig. 3, which represents a transverse section across such a mountain, and *X* the focus of an earthquake, it is evident that only that portion of the spherical wave which emerged along the axis, *a*, would reach the surface successfully; while those portions which struck against the strata of the flanks would be partially or wholly quenched. The mode of outcrop on the surface is shown in the map-view, Fig. 4, in which *a* is the point of emergence or spectrum, *b, c*, the granite axis, and *c, c*, the stratified flanks.

The velocity of surface waves is about 20 miles a minute, although some have been recorded as high as 30 to 35 miles per minute, and in some slight shocks occuring in New England, several years ago, the velocity as determined by telegraph, was estimated as high as 140 miles per minute. The amazing difference being caused by the fact that heavy shocks (large and high waves) break the medium, and are retarded as has been said, while slight tremors (small and low waves) are successfully transmitted without rupture, and therefore run with the natural velocity belonging to the medium, *i. e.*, the velocity of sound, which in granite is about 140 miles per minute.

This interesting subject, the illustrations for which are selected from Le Conte's "Elements of Geology, published by D. Appleton & Co., N. Y., will be continued in another article.

Close of the Volume.

This number closes Volume XXXVIII. of the MINING AND SCIENTIFIC PRESS. The practical results are in the main manifested in the index on the last page. We have not confined ourselves exclusively to mining matters, but have devoted much care and attention to the manufacturing and general scientific interests of this coast. Whatever has been of value to our mining and mechanical interests we have procured and inserted in our columns, drawing, therefore, upon the best scientific publications of the world, and from special sources of information. Particularly we have been desirous of furnishing information of value to our industrial classes. Our aim is still higher, and we are determined not to leave any means untried to develop our resources and awaken a justifiable pride in all of our institutions, whether for their improvement or amendment, or for the adoption and introduction of new features. As a new volume will commence with the next number, we regard it as a favorable opportunity for subscribers to send in their names, and for old subscribers to renew their interest in a publication devoted to the industrial progress of this coast. New and valuable matter will appear in every issue, and we shall not spare any effort to make our journal a necessity to all of our industries. The period of depression through which we are passing has, we believe, reached its climax, and more favorable times will soon enable us to press onward to the future goal which awaits us in the development of our resources, so recently begun.

THE "JEANNETTE." — Bennett's exploring steamer *Jeannette*, after making a satisfactory trial trip at Vallejo, is now at the wharf in this city. On next Tuesday she will start on her perilous voyage to the Polar sea, escorted as far as Onnalaska by the U. S. steamer *Alaska*, and escorted to sea by the entire fleet of the San Francisco Yacht Club as a mark of respect to Mr. Bennett and Captain De Long, who are both members of the New York Yacht Club. It will be remembered by our readers that the projector of this the first Polar expedition from this coast is James Gordon Bennett, of the New York *Herald*, who purchased and fitted out the vessel at his own expense, and will hear all the expenses of the voyage. Mr. Bennett turned the vessel over to the United States Government, and it was placed in charge of Lieutenant G. W. De Long, of the Navy, who brought her to San Francisco via the Straits of Magellan. Since her arrival here she has been strengthened at every point to endure the perils of an Arctic voyage, her engine overhauled and extra care and attention devoted to its perfection. Mr. Bennett has not spared any expense to make the vessel the most complete in strength and outfit. In fact, no exploring expedition ever started under more favorable auspices, and it remains to be seen, as it is hoped, whether success will attend the efforts of private capital to reach the North Pole by way of the Golden Gate.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Fish Farming.

EDITORS PRESS:—I am very much interested in the culture of fish, and appeal to you for information regarding it. Is it too late in the year to obtain young fish? What kind would thrive best in a pond having a constant supply of fresh water? From whom could I get them, and at what cost? By answering the above you will confer a great favor.—E. A. BRALY, Santa Clara, Cal.

There is no farm having a spring, brook or slough upon it, or even having a windmill pumping water, that cannot be made to yield a supply of good food fish for the use of a family and a surplus for sale. There are many farms in this State where fish are cultivated. Mr. Davis, at Brighton, in Sacramento county, on the high, dry plains, is largely in the cultivation of fruit and berries which are irrigated by windmills. He has thrown up an embankment about a couple of acres, and the surplus water pumped by his windmills runs into the pond thus made. This pond is about three feet deep. He procured a few fish from the Sacramento river, two years since, and now estimates that he has of old and young more than one hundred thousand fish. The late Mark Hopkins procured a few Sacramento River perch and nine catfish, five years since, and placed them in a slough on his farm in Sutter county. This slough now contains myriads and supplies not only the inhabitants of the farm but all of the people in the vicinity. Mr. Felts, of San Mateo county, has a farm in the hills of that county and constructed a reservoir for irrigation and for the use of his house and barns. He placed in the reservoir trout, salmon and land-locked salmon. It is becoming fully stocked, and in another year could be made a source of revenue. Mr. Clippinger, the railroad agent at Brighton, uses as a pond about half an acre of an excavation from which the earth was dug for the railroad embankment. A windmill supplies this with water. From a few dozen catfish placed in this pond last winter he estimates that he now has more than five thousand. Francis Francis, Seth Green, Livingston Stone, Fred Mather and other writers on fish culture have proven that an acre of water cultivated to fish will yield four times the profit that can be obtained from an acre of land. The water requires planting but once, the crop cares for itself and has neither to be housed nor fed. The State Fish Commissioners inform us that many farmers have written them and obtained instructions, and are stocking their waters with appropriate fish. They state that the interest in local fish culture is much more extended among farmers than we had supposed.

To answer Mr. Braly's questions, almost all water is suitable for some kind of food fish. But to answer what kind of fish should be placed in a given piece of water it is necessary to know, first: Is the water moderately pure? What is the highest temperature in summer? Is its bottom rocky, muddy or sandy? If, as we suppose, your pond is on the level land at Santa Clara, with a mud bottom, then the best fish would be carp, which you can obtain from A. J. Poppe, Santa Rosa, or Levi Davis, Forestville, Sonoma county, and Schuylkill catfish and Sacramento perch, which you can obtain from Henry Pither, Sacramento. A letter to one of the State Fish Commissioners, describing your pond, temperature of its water, source of supply, etc., with a request for information as to the most appropriate fish and where they can be obtained, will, we have no doubt, be promptly answered.

Letter from Mariposa County.

EDITORS PRESS:—Mining matters in this county have again assumed a lively and hopeful aspect. The active operations now being pursued by Joshua Hendy, of your city, who is the owner of the Bonderetta mine, has encouraged others to make fresh and early exertions to develop the numerous rich locations that center within a radius of 20 miles from this attractive and growing town.

The Bonderetta mine is indeed fast proving a literal bonanza to its present owner. With the new ten-stamp mill recently erected by Mr. Hendy, the net profit per day approximates closely $250, and when the tunnel now being run is carried some 900 feet further into the mountain, it will present a face of ore about 1,500 feet in length, conferring upon this property a value verging upon a quarter of a million dollars. Should the ore continue to increase in richness as it promises to do, its value may reasonably be estimated at a still higher figure.

A great deal can truthfully be said in favor of the Bondurant mines, comprising three locations, each possessing an area of 1,500 by 600 feet, all located on a well-defined and continuous lode. These mines are distant one and one-half miles from the Bonderetta mine and ten from the town of Coulterville. Recently these mines have come under the management of San Francisco, New York and Boston parties, who have incorporated under the name of the "Bondurant Gold and Silver Mining and Reduction Company." The property of the company consists of the three locations mentioned, and known respectively as the Sugar Pine, Bondurant and Bondurant Extension.

There is connected with the property a good eight-stamp mill with Hendy's concentrators attached, operated by a twenty horse-power steam engine; also hoarding-house, lodging-houses, blacksmith shop, stable, etc.

The developments made here consist of the following: A tunnel has been run on the Sugar Pine location, commencing some two hundred feet below the crown of the hill, and extending along the vein some three hundred feet, being all the way in good paying ore, from three to four feet in width the entire distance. From this tunnel continuing down in the pay chute, "A" "B" and "C" have been sunk. They are situated 100, 200 and 300 feet from mouth of tunnel, and have reached the depth of 40, 60 and 75 feet respectively. These shafts have produced rich rock and sufficiently developed the lode to demonstrate its permanent character and establish that if properly worked it cannot fail to yield large profits.

It is the intention of the new owners to erect both reduction and hoisting works complete the tramway from tunnel to mill, and sink a shaft from the crown of the hill to intersect the tunnel and "C" shaft.

The future of this company is flattering and the time not distant when they may reasonably expect to reap a liberal return for the money they have here expended.

No section of the State affords better inducements for engaging in quartz mining than Mariposa county. The ledges here are well defined, large and permanent, and wherever worked with system and care have yielded good profits.

In the vicinity of the Bondurant property are located the following mines, viz., the Martio & Walling, the Hasloe, Cook, Brothers, Washington, Princess, Ferguson, Coulterville, Eureka, Merced, Allen, Champion, Last Chance, McAlpin and the extensive property of the Pino Blanco Mining Association.

Some eight miles distant is situated the estate of the Mariposa Land and Mining Company, the Hite mine, noted for its large and profitable production of bullion, and its present splendid prospects, being distant about seven miles. From this it will be seen that the Bondurant lies in an excellent neighborhood.

With the promise of fresh capital matters look exceedingly favorable for this vicinity, and in my next communication I will submit additional details that will serve to acquaint the public with the superior facilities presented by this district for those desirous of engaging in legitimate mining enterprises.

BERWICK.

Coulterville, June 20th, 1879.

Utah Mineral Wax.

Mr. M. V. Ashbrook writes to the Salt Lake *Tribune* as follows concerning the great paraffine fields of that region: The mines are situated in Utah and San Pete counties, west of the Pleasant Valley coal fields. Arriving at the mines, I found such a formation and contour of country as is usually found in countries where coal is abundant and precious metals are wanting. Immediately above the paraffine mines I found an extensive bed of slaty shale or rock, strongly impregnated with petroleum. This bed of shale is 30 or 40 feet thick, and the stratum can be traced for miles. The shale is of some value for the oils contained in it. Below the shale is a belt or stratum of very soft friable sandstone of from 7 to 12 feet in thickness. In this belt of sandstone the mineral wax is found. The surface does not show a continuous vein like silver ores running parallel with the stratum of the rock, or in the general direction of the mineral belt. While the sandstone runs parallel with the shale stratum the paraffine is found in small veinlets cropping the sand stratum. The sand stratum is divided in sections and in the interstices of these sections the wax is found. There is also found in the wax veinlets a peculiar and very soft clay. The width of the wax in these outcroppings varies in different seams from one to seven inches. In some instances the clay in the interstices displaces the wax, at other places the wax compresses or presses aside the clay and occupies the space between the harder rocks.

Below the sandstone there is a soft slaty rock which breaks in blocks when removed, and seems to be the banging wall to the belt of mineral. The outcroppings so far as discovered have been located. Little work has been done to determine what is in the depths below. In no place did I see a hole beyond the depth of eight feet. The extent of wax can only be determined by development. From the surface indications, I judge that there is an extensive deposit of this paraffine and that as depth is attained the veinlets will consolidate into a large body or deposit. The formation, and more especially the impregnation of rocks and soil, leads me to this conclusion. As to the uses the arts and sciences will make of this wax, though it be in abundance, I am little informed. It will be, if not now, a useful and merchantable article, but, I opine, echo is asking when? The indications are good and petroleum will be found in the wax country. That article has been utilized.

THE Old Colony railroad, of Massachusetts, is having several cars built, in which the windows are made to swing outward like a pair of double doors, hinged upon a narrow upright rod, running perpendicularly, in the center of the window aperture. The object is to give passengers fresh air without an admixture of cinders.

The Good Time Coming.

[Written for the MINING AND SCIENTIFIC PRESS by ALMARIN B. PAUL.]

At no time since the opening of the Comstock, which electrified the world with its wonderful production, has there been such a brilliant outlook as is now looming up for our mining industry. On every hand there is awakening a renewed spirit of enterprise, industry and hope. Eastern as well as home capital is on the move through our mountain ranges, seeking investment. Old claims are being re-staked, re-opened and made to develop their worth. Our mountains are beginning to reverberate with the echoes of the working of new machinery, and the faces of our old miners smile with the cheer of the coming golden era.

Not only is renewed interest awakening in California, but all over the Eastern and Western States is growing a spirit for mining ventures. And is it strange that it should be so, when our mines have made more millions than any other pursuit, and built so many palaces of beauty and blocks of such substantial wealth. New York, Chicago and St. Louis are beginning to pour out their surplus millions, and soon we will see these great cities the peer of San Francisco in their mining operations. That San Francisco embodies all the dash, enterprise, wealth and pluck for mining ventures, is only to be harbored in minds of limited experience.

Well does your humble servant remember the opening of Lake Superior, and the mining fever of that time, and how New York, Boston, in fact, how the East and the West poured forth their millions of money, and men of skill, enterprise and worth. Again, we all know how it was on the opening of California.

We may look at our palaces and substantial blocks, built by successful mining ventures, but let us look also to the great coal and iron interest of Pennsylvania. It is not for us on this coast to underrate, but to appreciate and draw by our best endeavors this capital, tact and enterprise, for without it we may loose much. California and Nevada are having formidable rivals for this wealth and enterprise in Colorado and New Mexico, to say nothing of Virginia, North and South Carolina. What has awakened this the present new spirit for mining East, is not only our vast production, but the fact of such rich discoveries as those of Leadville, Colorado, which, in silver, is expected, and bids fair to rival the Comstock in its production, as well as the gold discoveries in the various sections of the great mineral belt extending southward.

California and Nevada have a great record for mineral productions, which is a guarantee for the future, and, as full security for mining capital, which endeavors to move where there is the surest backing (independent of the well-known sections of our State), our new mining regions in the main belt of the Sierra Nevada promise much. I mean all that section of country off of Bodie and extending southward the whole line of the Nevada to Walker's pass—a chain over 200 miles in length. And I unhesitatingly predict that this vast belt, whose peaks tower from 8,000 to 12,000 feet in hight, will, in less than a quarter of a century, be the seat of such stupendous mining works that nothing of our present will be the equal. This chain of mountains possesses, with its mineral lodes of great proportions, advantages for wood and water, and in localities water for power, capable of running 500 stamps and, in the coming future, mills of 100 stamps each will be the rule and not the exception, as now. Tioga, Prescott and Lake districts are but the beginning of this vast undeveloped mineral field. Not only are there advantages of wood and water, but facilities for mining are excellent. The Mammoth, of Lake, with a tunnel 700 feet in length, gives 1,000 feet of "backe" on the lode. As to quality of ore, it is sufficient to say it "is pay." The same may be said of the True Blue, and others. Then again, in the ranges lying first to the east, but in the State of Nevada and extending southward to the borders of Arizona, is a vast region of silver wealth, with lodes of great proportions and richness, but which, for the lack of capital, have laid for all these years untouched.

It is in these sections of California and Nevada "rich discoveries" will be heralded every little while, and there will be merit in the reports. Twelve years ago I explored much of this whole region for hundreds of miles north and south, and know whereof I speak. That there is a good time coming, I argue from two standpoints, first that surplus capital from the East and West is going into mining, it cannot be satisfied with four per cent. per annum; there is too little in that to satisfy the restless spirit and greed of Americans, and what industry promises the return of mining with caution, experience, and its accumulated advantages. As the New York *Herald* once observed, what industry could stand the same expense of mining with its rates of labor. It would have ruined every other pursuit.

I argue it further from the fact that our skill is now great; our experience more complete, as well as the vast strides in mechanical devices, and wherehy tunnels are driven by steam or water power, instead of by hand.

The powerful yet cheap explosives which are made often to uplift whole hills at a single blast, while "giants" melt and wash off the auriferous earth as snow banks before a scorching sun. Not only this, but while too many still cling to a wasteful system of milling our ores, there are improvements in every class of milling machinery, and which, at less expense than formerly, returns a much higher per cent. From all this, to say nothing of the reduction in the price of labor, I argue a good time coming.

As to our new Constitution, and the assured favorable legislation in favor of mining, there will be given a guarantee for mining capital to a degree which it never yet has had on this coast.

The people have grappled with the corruption of the past and conquered, and while there will be strong opposition to villainous speculative measures, there will be care to foster honest mining, and to throw guards around both home and foreign capital for its better security.

From all these points I argue a great mining revival, and that capital will not only soon be plentiful, but that it will be rewarded, if only moderate care is exercised; and it should be the desire of all to make every foreign investment remunerative, that we may not, as in times past, by rascally deception, kill the goose that lays the golden egg, for the incoming of foreign capital will enhance our prosperity and help to open the coming golden era.

San Francisco, June, 1879.

Cold Waves and Their Causes.

The climate of the United States, especially the eastern portions of it, is subject to great and rapid changes. These are caused, in many instances, by the large extent of surface over which its territory extends, and the difference in the amount of solar heat received in different parts. When large bodies of snow have been deposited in the north, the wind sweeping over them is deprived of its heat, and a lower temperature is the result. When winds from more southerly latitudes occur, the reverse takes place. The vicinity of the large oceans which margin the continent of North America on the east and west also tend to produce a change, water parting with its heat less readily than the land. In addition to these the current of warm water thrown along the east coast of the United States by the Gulf stream, and in the Pacific by the Sea of Japan, also exerts a powerful influence on the climate of the regions adjacent to the shores touched by them. In the great valley of the Mississippi the cold wave usually has its origin in the ice and snow-covered countries directly north, and periods of drouth by winds from the south.

In European countries the cultivation of the soil and the removal of timber have produced important climatic changes, and the same has been noticed in the United States. Our winters have not so much severe weather as occurred in the early settlement of the continent, but it takes place more suddenly and to a greater extent. This is easily accounted for, as the surface of the country, when denuded of timber, presents less obstruction to the advance of storms, and also affords a greater diversity of exposure in its surface to the rays of the sun, and becomes more readily and differently heated. As is well known, wind is nothing more than air rushing in to restore the equilibrium which has been disturbed by expansion caused by heat, and when the air thus moving is loaded with snow or other vapor, this, when meeting with air of a different temperature, condensation takes place and rain or snow is deposited.

The influence of these sudden changes on health is a subject for the investigation of medical men and philanthropists. That it has much to do in causing physical infirmities can not admit of a doubt. A change of 40 degrees of temperature, such as occurred on January 2d, must aggravate all diseases of the pulmonary organs, and hence, perhaps, the extent and fatal effects of consumption in the Eastern and many of the Western States.

Countries in which the temperature is nearest uniform, whether it be high or low, are generally least afflicted by diseases which arise from exposure to the extremes of heat and cold; while almost every portion of the habitable globe is subject to visitations from maladies which produce disease and death. These generally arise from local causes, such as stagnant water and large quantities of animal and vegetable matter undergoing decomposition.

They do not extend to large areas, and instances of longevity in such countries are not uncommon. The lengthening day and the restoration to a state of rest of the disturbed atmosphere will cause the cold waves to be in a manner temporary; but so long as large bodies of ice and snow are spread over the Great Lakes and large portions of the North and West, the recurrence of these waves of cold may be expected to prevail.—*The Meteorologist.*

COOLING HOT JOURNALS.—Von Heeren proposes a method of cooling hot journals by a mixture of sulphur and oil or grease. The fine metal dust formed when a journal runs hot, and which strongly acts upon both journal and bearing, forms a sulphide of sulphur. This compound, which grows soft and greasy, does not cause any appreciable amount of friction. It has been very successfully used by the steamers of the North German Lloyds.

BLACK POLISH ON IRON AND STEEL.—To obtain that beautiful deep black polish on iron or steel which is so much sought after, it is required to boil one part of sulphur in ten parts of oil of turpentine, the product of which is a brown sulphuric oil of disagreeable smell. This should be put on the outside as slightly as possible, and heated over a spirit lamp till the required black polish is obtained.

MECHANICAL PROGRESS.

The Austrian System of Milling.

[From Prof. Kick's new work on Milling.]

High milling—or, as it is also called, Vienna, Austrian, Hungarian, Prague, or Saxony milling—is that method of grinding wheat which, by a gradual reduction of the grains of wheat, aims at producing the largest quantity of middlings, which, being cleaned, reground, and again cleaned, etc., and consequently gradually reduced, is finally manufactured into flour. This system of grinding, which originated in Vienna, produces the most beautiful and the whitest, and generally the finest kinds of flour, in proportionately larger quantities. In the Austrian system of grinding, the stones are placed at such a distance from each other that the first time the grain passes through them it is only slightly rubbed and broken. In this operation the beard and parts of the cuticle would be rubbed off, if this was not done before by the hulling machine. This operation is called ending, (Spitzen), or, in case the stones grind more coarsely (Hochschroten), inasmuch as in this coarse grinding the grain is broken along the entire length of the furrows, so that the produce therefrom is mixed with flour, branny particles, and germ that have been scraped off. The products are separated by sieves, and the result is dark flour, poor bran, and coarse middlings. The latter product is passed through stones placed more closely together, and is subjected to the first grinding, that is to say, it is further broken, and we obtain particles varying in size, flour, *dunst* (which is analogous to flour), middlings, and a still coarser commodity called *schrot*. After this product has passed through the sieves, the different sorts are graded according to their size, consequently all those branny particles, which are of equal fineness with the flour mingle with the flour, and those of the same size as the so-called *dunst*, with the *dunst*, etc. It is scarcely possible to separate from the flour the equally fine branny particles; this is done, however, as far as the middlings and dunst are concerned, by means of middlings purifiers.

The question now is, of which parts of the grain of wheat does the several products consist? The flour obtained from the first grinding (Schroten) will be better, in other words, will contain fewer branny particles than that obtained by the operation *hochschroten* above described, but it will nevertheless contain a great number, seeing that the stone exercises a breaking action upon the grain, and more or less reduces the cuticle.

Dunst and fine middlings are mostly composed of small fragments of the flour substances, and in the process of breaking fall from the inner as well as from the innermost part of the grain, and become polluted by the admixture of branny particles of equal fineness. If these are removed by the middlings purifier we obtain pure middlings, which in consequence of being derived from the innermost part of the grain, are called *core-middlings* (Kerngriese), or, because they are used for making the finest flours, Auszugmehle and Auszugriese.

The coarser middlings (Auflœsungen), and the still coarser *schrot*, are fragments which, the larger they are, the more certain are they to be overlaid with portions of the layer of gluten, of the skin of the germ and the grain, and are, consequently, of a much darker color than pure middlings. The coarse middlings and the coarser *schrot* are put through the purifying machine, in which they are gradually reduced. If during the preliminary grinding (Hochschroten) germs get loosened from the grain, they get knocked off especially during the first grinding, and arrive in proportion to their size, for the most part uninjured, among the coarse middlings, to which they impart, by their yellow color, a speckled, yellow appearance. The product of the preliminary grinding is separated, and the middlings and finer middlings purified.

It is exceedingly difficult, nay, even impossible, to give to non-practical men anything like a clear idea of the nature and appearance of the various milling products either by description or illustration. The only way in which he can become acquainted with them is by seeing them in a well conducted mill, where high milling is practiced.

The first rough grinding is followed by a second, the second by a third, and the third by a fourth, but the number of these is not in all mills alike. We must not imagine, however, that in these successive divisions or breaking up of the grain, that in the preliminary grinding (Hochschroten) the grain is broken in two, and by the first grinding (Schroten), it is broken into four pieces, etc., on the contrary, the division when the stones are rightly placed, is so managed that at each successive operation the several parts gradually loose their polyhedrous or spherical shape, and assume a lamelliferous form. In the first, second and third rough grindings, the greater part of the grain is consequently reduced to flour and middlings, and the material which undergoes fourth grinding has become so far triturated that no coarse middlings can be got from it, but only dust mixed with numerous particles of outer husk. Along with these we obtain flour as well as coarse and fine husks. There are scaly particles consisting of gluten, and the cuticle of the germ and the grain, to which a perceptible number of starch cells adhere. In many mills these scaly particles are called stripes, in fact those remaining after the fourth and fifth grinding, *white stripes;* and after once more grinding *black stripes*. The fine and coarse roughs are in many mills ground together, in others separately. The former go also by the name of *Haspan*. By ground roughs and ground *Haspan*, we understand those scaly parts, which, by their repeated passage through the stones, are freed from the particles of flour adhering to them, which serve as fodder for cattle and horses, and are distinguished by the general name of bran.

The Sand Blast.

Among the wonderful and useful inventions of the times is the common sand blast. Suppose you desire to letter a piece of marble for a grave stone; you cover the stone with a sheet of wax no thicker than a wafer, then cut in the wax the name, date, etc., leaving the marble exposed. Now pass it under the blast and the wax will not be injured at all, but the sand will cut letters deep into the stone.

Or, if you desire raised letters, a flower or other emblem, cut the letters, flowers, etc., in wax and stick them upon the stone; then pass the stone under the blast and the sand will cut it away. Remove the wax and you will have the raised letters.

Take a piece of French plate glass, say two feet by six, and cover it with fine lace; pass it under the blast, and not a thread of the lace will be injured, but the sand will cut deep into the glass wherever it is not covered by the lace. Now remove the lace and you have every delicate and beautiful figure raised upon the glass.

In this way beautiful figures of all kinds are cut in glass, and at a small expense. The workmen can hold their hands under the blast without harm, even when it is rapidly cutting away the hardest glass, iron or stone, but they must look out for finger nails, for they will be whittled off right hastily.

If they put on steel thimbles to protect the nails, it will do little good, for the sand will soon whittle them away; but if they wrap a piece of soft cotton around them they are safe. You will at once see the philosophy of it. The sand whittles away and destroys any hard substance, even glass, but does not effect substances that are soft and yielding like wax, cotton or fine lace, or even the human hand.—*Exchange.*

A Use for Niagara Falls.—If we may believe Sir William Thompson, the famous complaint which was once expressed as to the waste of good water power at the Falls of Niagara is destined to be at last satisfied. Sir William, in his evidence before the Select Committee on Electric Lightning, proposes to light North America, or a good part of it, by means of electricity generated by dynamo-magnetic engines in the neighborhood of the falls. These engines would not only light the homes of New York and Philadelphia, but also turn their sewing machines and boil their kettles. This prospect was at first a little too much for the committee, and Dr. Playfair seems to have timidly suggested that the Falls of Niagara were a little out of the record. He evidently forgot that Great Britain, by means of Canada, has a certain proprietorship in those falls, and that we must not allow our friends of the States to monopolize the good gifts of science and Providence. Possibly the Atlantic cables might be utilized so as to make Niagara light London, and in that case amiable noblemen of the future will have other associations besides Britania's trident on the azure sea to couple in verse with the great cataract. There is an opening, too, for his enterprising Highness the Khedive to utilize about the only thing in Egypt he has not yet utilized—the falls of the Nile. It would not be surprising if some enterprising projector had already telegraphed for a concession of the second cataract after hearing Sir William's evidence. He is evidently an enthusiastic partisan of the new method of illumination, and no one can deny that his opinion is a weighty one.

Navisphere. — A new instrument, which promises to be of great service in navigation, has recently been described in the French Academy by M. Magnae. It is called the navisphere, and its use is to indicate in a few seconds, without calculation being required, the names of the stars that are above the horizon at a given moment, to show their altitudes and azimuths, to determine approximately the proper angle of course for going from one point to another by an arc of a great circle, and the distance between these points. The instrument has two parts—the first consisting of a celestial sphere, having stars of the first and second magnitudes marked on it. This sphere rests on a spherical zone, wherewith it can be placed in all possible positions. The second part (receiving the special name of metrosphere) comprises the system of the horizon, the meridian, and the vertical, represented by a circle, a semi-circle, and a quarter of a circle, of metal. The arc representing the meridian is fixed at right angles to the (horizontal) circle of the horizon, joining the latter at zero and 180°. Its own zero is in the middle, and represents the zenith, thence it is graduated to 90° on either side. One end of the quarter-circle, representing the vertical, turns about a fixed axis in the middle of the meridian; its other end is adjusted to pass along the circle of the horizon. With this system, then, it is possible (1) to trace arcs of a great circle on the sphere and measure their lengths; (2) to measure the angles formed by two great circles.—*Iron Age.*

SCIENTIFIC PROGRESS.

New American Industries.

The recent rapid increase in American chemical manufactures—in many cases from native crude materials—is a very encouraging feature of American trade. The *Grocer* notes that six years ago we imported from France cream of tartar to the extent of 9,000,000 pounds yearly; but so successful has the manufacture of it in this country been carried on, that last year not a single pound was imported. Notwithstanding the crude materials have at present to be imported, the price of the manufactured article has been reduced from 32 cents per pound, the rate for the French article, to 23 and 24 cents per pound for the American production. France and England formerly sent us annually 500,000 pounds of tartaric acid, while the importation for the last fiscal year was 183 pounds. England formerly monopolized our market for nitric acid to the extent of 250,000 pounds annually, at the rate of $1.30 per pound, while last year 27,018 pounds were imported and sold at the same price as the American article—57 cents per pound. At present the lime juice from which citric acid is made has to be imported, but it could easily be produced from fruits grown in Florida, if only sufficient energy were put into the work. If the lemon and lime growers of the South can be induced to prepare the lime juice, the entire production and manufacture of citric acid will be kept in this country, saving hundreds of thousands of dollars annually, and developing another great industry. Borax was formerly brought from England at the rate of from 600,000 to 1,000,000 pounds per year. Owing to the development of borax mines in Nevada, this importation has largely fallen off, and the report for the last fiscal year showed only 3,492 pounds, and the price of the refined article, which is now prepared in New York city, is only from 8 to 9 cents per pound, when formerly it was 35 cents, England being now among the buyers instead of the principal seller, as she once was, both of the crude and refined product.—*Manufacturer and Builder.*

A Great Russian Telescope Projected.—At a meeting of the National Institute in Washington, May 29th, Prof. Newcomb stated that he has received letters from Otto Struve, Director of the Pulkowa Observatory, announcing that the Russian government has voted 250,000 rubles for the construction of the largest telescope that can be advantageously made, including the building in which to mount it. The object glass is intended to be between two and one-half and three feet in diameter, if the glass makers find it practicable to cast a disk of this size of the necessary evenness and purity. It has not yet been decided who shall undertake the most difficult part of the work, the grinding of the glass; and before deciding it Struve intends to visit this country in order to examine the Washington and other great telescopes made by Alvan Clark & Sons. He will probably arrive here for this purpose some time during the summer. Should his examination prove satisfactory he will be ready to open negotiations with the Clarke for the work if he is sure it will be done enough better to warrant the risk of sending the glass twice across the Atlantic.

Iron Atmosphere.—Observations of snow collected on mountain tops and within the Arctic circle far beyond the influence of factories and smoke, confirm the supposition that minute particles of iron float in the atmosphere, and in time fall to the earth. Some physicists believe that these floating particles of iron are concerned in the striking phenomena of the aurora. Gronemann, of Gottingen, holds that streams of the particles revolve round the sun, and that when passing the earth they are attracted to the poles, and thence stretch forth as long filaments into space. But as they travel with planetary velocity they become ignited in our atmosphere, and thus produce the luminous appearance of auroræ. In his recent voyages Prof. Nordenskjold examined snow far in the north beyond Spitzbergen, and found therein exceedingly small particles of metallic iron, phosphorus and cobalt.

Electric Pens.—The most recent of the brilliant series of telegraphic marvels which have from time to time, and especially of late, engaged the world, is the "telegraphic pen" of Mr. E. A. Cowper, the well-known engineer of Great George street, Westminster. There had been hitherto no lack of copying telegraphs, all of which instruments telegraph an almost perfect copy of the writing submitted to them, but the process is necessarily complex and slow; whereas, by the new device, a person may take the writing pencil in his hand and himself transmit his message in the act of writing it.

New Scale.—By making a miniature of an object, such as a spider line, and examining it with a microscope, Dr. Royston Pigott has found that objects even as small as the millionth of an inch could be seen; and in a late communication to the Philosophical Society, Cambridge, took exception to the view generally prevailing among opticians, that it is useless to attempt further perfection of the microscope.

Use of Glass Thread.—To make fine glass thread, the glass is brought to a state of fusion, a glass rod dipped in it, and thus a thread pulled out, which solidifies first in its thinnest parts, and so causes a thread of uniform thickness to be obtained. If this thread is placed over a hot metallic cylinder, and the latter revolved, any length of thread may be obtained; the thread may be obtained finer by revolving the cylinder more rapidly. The heating of the cylinder has the effect of annealing the glass to some extent, while the rapid cooling, if wound on a cold cylinder, would make it more brittle. A bundle of such threads look like a bunch of silk, and it has therefore been called glass silk. Its usefulness to chemists and druggists has lately been brought to the notice of the French Societe de Pharmacie by M. Limousin. It is now largely used in Germany, and especially in Austria, for filtering liquids in laboratories. In the microscope the threads are as fine as those of silk or fibrillæ of cotton; they break more easily than the latter, but are excessively supple. From the unalterability of the substance it is very well suited for filtering acid or alkaline solutions, even concentrated, and various other substances, such as nitrate of silver, albumen, collodion, Fehling's liquor, etc. It affords great rapidity of flow, with good filtration, it does not, like filters of paper or tissue, communicate organic matter to the liquids, altering and perhaps giving them a disagreeable taste. It is much preferable to asbestos, which, from the arrangement of its parallel fibers, cannot be formed into a flexible ball, and which lets fragments pass that float in the liquid. For analysis it is very advantageous, allowing of a ready determination of insoluble matters deposited; also by calcination and fusion of the glass may be found the volatile principles fixed in the passage of the liquid, unmixed with empyreumatic products. Notwithstanding the price of glass silk is still high, it is no great expense to use it, as its excessive lightness admits of a considerable number of filtrations being made with a small weight of it; besides, it may serve an indefinite time, if after each operation it is thoroughly washed with water and dried in the air.—*Manufacturer and Builder.*

How to Get Rid of Flour Mill Dust.—A French process designed to circumvent the perils traceable to dust in flouring mills, is thus described: The stones should be surrounded as completely as possible by a movable covering of wood or sheet-iron, which should have no opening in front but what is absolutely necessary for the work. In order to avoid the choking up of the ventilating pipes, it is necessary to provide special discharge pipes for the water, according as the stones are partly below or entirely above the floor. Again, the passages intended for carrying the dust should be placed underneath the stone, and beyond the point where the work is applied, regarding the direction of motion; it should have a breadth a little greater than that of the stone, and a depth of eight inches at most, for the largest stones, a sliding door serving to close it whenever dry dust is not produced. The water discharge pipe should also have a valve, which may be closed when water is not used, and when it is desired to carry of the dust produced when the stone is trued. If there are only four or five stones in the work, a single collecting pipe will suffice, and the blower should be placed at the end; but if there are eight or ten stones in one line, a second collector, 16 inches by 12 may be placed in the middle of the length of the first, and perpendicular to its direction. If, too, there are two long parallel rows, with eight or ten stones in each, they should be connected with the second collector, or with a third, 16x20 inches, communicating with the ventilator.—*Exchange.*

Taming Horses by Electricity.—Foreign papers inform us that the General Omnibus Co., of Paris, has for some time past made successful use of electricity in subduing vicious horses. Upon passage of a weak current (by a small induction machine of the Clarke system, the wires of which connect with the bit) into the mouth of the animal whenever he becomes restive, his will seems for the time "almost annihilated;" he leaves off rearing, kicking, or biting, and submits peaceably to be groomed or harnessed. The idea of utilizing this agency for such a purpose found expression at the exhibition last year; in the Swedish section was an apparatus with this object, the construction, action and effect of which is thus described by the London *Live Stock Journal:* "It consisted of a small box containing a battery, the wires of which communicated with the bit by the reins. In the case of resistance by the horse, the driver had merely to push a button, when a current passed immediately, and the animal became docile. The employment of electricity is said to produce a sort of uneasiness or torpor, rather than pain, and is much less harbarous than many taming methods hitherto adopted, such as those which depend on weakening by deprivation of food, on fatigue, etc."

New Globe.—M. Clemandot, of Paris, has invented a globe for electric lights. It is double—one globe placed inside the other, and the space between is filled with powdered glass. It is said to diffuse the light without lessening the illuminating power so much as the opaline globes generally used.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 5.		Week Ending June 11		Week Ending June 19		Week Ending June 26	
Alpha	29½	22¾	32½	28¾	29½	23	30	25½
Alta	10	8¾	11½	9¼	10	8½	8¾	6¾
Andes	1.35	50c	1½	80c	1.15	65c	1	75c
Alps	....	....	....	....	....	....	....	....
Argenta	1.15	1	1⅛	1	1.15	1	1.20	1
Atlantic	25c	....	45	35c	50c	....	35c	30c
Aurora Tunnel	....	....	....	....	40c	....	70c	40c
Baltimore Con	1.35	1	1.30	1	1.30	50c	75c	....
Belcher	6¼	5⅜	7⅜	5¼	6⅜	6¼	7	6¼
Belmont	75c	55c	75c	65c	65c	60c	30c	....
Best & Belcher	22	18⅝	21	19	19	17½	19½	17¾
Bullion	6⅝	7¼	11¾	9¼	8⅜	7¼	9¼	7¼
Bechtel	2.40	1.90	2	1.70	2	1¾	2.15	1.65
Belle Isle	1.40	1	1.40	1.15	1.55	1.35	1.70	1½
Bodie	41	36½	45	41	46½	38½	42	20¼
Benton	7¾	6	8⅞	7½	7	6	6	4½
Bulwer	14½	11½	12½	11¼	12	10	10	9
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2¾	2	3	2	2½	2	2.60	2.10
Belvidere	2½	1½	2.10	1.55	2.10	1¾	1.90	1.60
Booker	1.05	75c	1.10	70c	1	90c	1.60	1
Caledonia	3.30	2¾	4¾	2.65	3.15	2.60	2.80	2½
California	7	6¼	7½	6¼	6⅜	5⅝	5⅜	5⅛
Challenge	3¾	2	3.40	3	3	2.85	3.05	2.90
Chollar	9⅜	7½	9	8¼	8⅜	7⅝	9	7⅞
Confidence	18⅝	15	16½	15	15½	14½	16	14
Con Imperial	2	1.65	2.35	1.90	2.20	1.70	2.20	1.80
Con Virginia	6¾	6½	7	6⅜	6½	5	5⅜	5¼
Crown Point	6½	5½	6⅜	5½	6	5⅜	5¾	4¾
Con Washoe	....	....	30c	....	40c	....	55c	45c
Champion	45c	35c	50c	25c	70c	50c	50c	40c
Concordia	30c	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	....	10c	5c	10c	5c	5c	....
Daney	....	....	....	....	....	....	....	....
Day	1½	50c	45c	30c	45c	40c	....	....
Eureka Con	18⅜	17½	17	15¼	17	15¼	17	15¼
Exchequer	9⅜	8	12	9¾	9⅜	7½	9	7¾
Endowment	40c	30c	35c	25c	....	....	25c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4½	3.45	4	3.60	4.20	4	4.05	3.80
Gila	75c	15c	75c	65c	80c	75c	1.55	90c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	13	14	12	14	....	15¾	....
Goodshaw	80c	65c	75c	50c	80c	70c	70c	60c
Gould & Curry	13	11½	13¼	11⅝	12¼	11¾	13¼	11⅝
Hale & Norcross	18½	15½	18	17	17	15½	18⅜	15¾
Hillside	2¼	2	2.95	1.90	2	1.90	1.90	1½
Highbridge	35c	30c	35c	25c	60c	25c	30c	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	10c	5c	10c	5c	10c	5c
Independence	3.90	3	3¾	5	3.10	2.90	2.90	2.60
Julia	4¾	4.30	5¼	4½	4.80	4.30	4.35	3.90
Justice	4.85	3.80	4¾	4.30	4.10	3¾	4.20	3¼
Jackson	6	5½	5¾	....	6	5⅝	5½	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	6	5¼	5⅞	5	5¼	5	5¼	5
Kossuth	....	....	....	....	20c	15c	20c	15c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	2	70c	1.45	1¼	1.35	1.20	1⅜	1¼
Lady Wash	1.95	1.60	3	2	2.40	1.90	2.30	1¾
Leopard	1	65c	80c	65c	1	....	1.20	1.05
Leviathan	80c	55c	75c	70c	75c	70c	80c	70c
Leeds	75c	....	1	50c	1	70c	90c	75c
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	50c	30c	40c	25c	75c	50c
Modoc	1½	10c	1½	1	1½	1	1½	1
Manhattan	2.35	2¼	2¾	2¼	3	2¼	2¾	2½
Martin White	6½	....	6¾	6	8¾	6¾	7	....
McClinton	1½	1¼	1⅜	1.20	1.65	1¼	1.60	1¼
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	45½	42	45	39	39½	33	32½	26¼
Mides	....	....	1½	....	....	....	....	....
Morning Star	3	....	3	....	....	....	3	....
North Con Virginia	11	9	9½	8¾	9	8	8⅞	8½
New York	1	65c	1½	90c	1.15	80c	95c	65c
Northern Belle	7	6⅝	6¾	6½	6⅝	5	6	5⅝
New Coso	....	....	....	....	25c	....	20c	....
Navajo	50c	25c	45c	35c	50c	45c	45c	40c
Occidental	60c	50c	1	85c	1	75c	1	85c
Ophir	39½	37½	36¾	32½	34½	32	35	31
Oriental	65c	....	75c	70c	75c	50c	85	45
Overman	12	10½	12½	10¾	13	11¼	12¼	10
Panther	....	....	....	....	....	....	....	....
Phenix	3	2½	2½	....	3½	3	3½	3¼
Phil Sheridan	1	75c	90c	50c	90c	60c	80c	65c
Potosi	6¼	5½	7	5¾	6½	5¼	6⅜	5¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	6½	4¼	5	4¼	4¾	4¼	5¼	4¼
Richer	80c	....	65c	60c	75c	55c	85c	70c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17½	15	16¾	15½	16	14¾	17⅜	15
Seg Belcher	....	....	28	25	28	24	....	....
Sierra Nevada	56¾	51½	56	48	48	43	48	43½
Silver Hill	3	2¼	3	2.40	2½	2	2¼	1.80
Silver King	8	7	....	....	8	....	7	....
Silver Prize	50c	40c	....	....	....	....	....	....
Succor	1	80c	90c	70c	80c	50c	1½	5c
Summit	2½	2	2¼	2	2½	2¼	2.80	2
Scorpion	3¾	3	3.40	2.10	2.90	2¼	2.90	2½
Solid Silver	20	10	20c	10c	45c	10c	45c	40c
South Bodie	65c	40c	45c	40c	45c	40c	45c	40c
South Standard	25c	20c	50c	20c	35c	25c	30c	25c
Star	60c	25c	40c	35c	40c	25c	40c	25c
St. Louis	....	....	50c	....	....	....	....	....
Syndicate	4½	3.45	5	3½	5½	4.90	7	6
Tioga Con	3.90	3¼	4	3	3.95	3¾	5¾	4.95
Tiptop	90c	75c	1⅜	95c	1½	1¼	1½	1.15
Trojan	40c	25c	35c	30c	35c	25c	35c	25c
Union Con	97	87	99	75½	79	63	61	43
Utah	31	24	28	23	23	21½	22¼	21
Vermont Con	....	....	....	....	....	....	....	....
Ward	1½	1¼	2	1¼	1⅜	1½	1.60	1½
Wells Fargo	30c	25c	40c	25c	25c	20c	20c	....
Woodville	50c	25c	40c	30c	40c	30c	50c	30c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	21½	20	21¼	20¼	20	18½	19⅜	17

Sales at S. F. Stock Exchange.

Friday A. M., June 20.
150 Andes..........90c
170 Alta..........8¾@8
170 Alpha..........25¾@26¾
1700 Atlantic..........30@35c
270 Benton..........5¾@5⅞
85 Best & Belchor..........17¾
915 Bullion..........8@8¾
1115 Belcher..........7@6¾
30 Confidence..........14½
2250 Con Imperial..........1.90
1270 Con Virginia..........5⅜@5½
400 Con Wasnoe..........45c
800 Caledonia..........2¼@2.60
100 Challenge..........3@2.95
580 C Dorado..........2@1.80
120 Chollar..........8@7¾
930 California..........5⅜@5¼
65 Crown Point..........5.15@5¼
830 Exchequer..........8¼@8⅜
50 Fairfax..........1½
300 Flowery..........80@75c
180 Gould & Curry..........11⅝@11½
265 Hale & Nor..........16½@16⅜
1155 Julia..........4¼@4.10
80 Justice..........3¾
330 Kentuck..........5
380 Lady Bryan..........1¼@1.30
850 Leviathan..........80@75c
100 Lady Wash..........2¼
1010 Mexican..........30@31¼
100 Mount View..........2.40
600 Mackey..........1.80@1.70
200 N Bonanza..........2@2.05
315 North Con Vir..........8⅜@8⅞
50 New York..........95c
540 Ophir..........31@32
205 Overman..........11@11¼
90 Occidental..........95c@1
150 Plutus..........2
160 Potosi..........5¾@5⅞
10 Seg Belcher..........25
50 Succor..........55c
930 Sierra Nevada..........44@45½
335 Savage..........15@15½
600 S Utah..........30c
455 Silver Hill..........2.10@2
380 Scorpion..........2.60@2¾
860 Solid Silver..........45@40c
1475 Union Con..........61@56½
20 Utah..........22½
940 Ward..........1½@1.55
200 Wells-Fargo..........20c
90 Woodvillo..........40c
120 Yellow Jacket..........18¾@19

AFTERNOON SESSION.

750 Alhou..........40c
340 Argenta..........1
100 Aurora T..........40c
3130 Adenda..........50@60c
1150 Belle Isle..........1.70
85 Bulwer..........10
745 Bodie..........42
830 Bechtel..........2¼@2.05
185 Belvidere..........1¾@1.60
2000 Booker..........1
1345 Black Hawk..........2½@2.60
850 Champion..........50@40c
90 C Pacific..........8@8½
400 Caledonia (B H)..........4.20
600 Crœsus..........10@15c
300 Chieftain..........10c
200 DeFrees..........10c
2550 Dudley..........1.55@1½
100 D Standard..........60@50c
105 Eureka Con..........16½@15½
300 Endowment..........25c
70 Fourth July..........75c
1455 Gila..........90c
105 Grand Prize..........3.90@4
600 Goodshaw..........65@70c
1700 Glynn Dale..........75@95c
20 Giant & O A..........4
300 Hillside..........1.80
7075 Hamburg..........60@70c
720 Independence..........2¾@2.90
965 Jupiter..........1.95@2
300 Leeds..........75c
50 Leopard..........1.20
20 Manhattan..........2⅞
100 Modoc..........1¼
500 Mt Diablo..........4¼
175 May Belle..........50@65c
200 McClinton..........1.40@1.45
635 Mono..........10½@10
500 Mammoth..........12½
10 Martin White..........7
95 Northern Belle..........5⅞@6
390 Noonday..........4¾@4.65
450 N Noonday..........2
700 Orieutal..........75c
700 Orient..........35@40c
200 Phenix..........3¼
100 Paradise..........1.90
250 Queen Bee..........55@50c
1745 Raymond & Ely..........4½
150 Red Cloud..........75@80c
200 Richer..........70@75c
200 Star..........35c
915 Summit..........2.85@3
160 Syndicate..........7@6⅞
500 S Standard..........25c
400 S Bodie..........45@40c
780 S Bulwer..........1¼@1½
150 Tuscarora..........10c
1715 Tioga Con..........5@4.95
500 University..........65@70c
750 Vortex..........75@60c
100 Wales..........2½

Saturday A.M., June 21.
165 Alpha..........27@26½
190 Alta..........8
325 Andes..........80@95c
200 Atlantic..........35c
260 Argenta..........1.05@1
4025 Adenda..........60c
230 Best & Belcher..........16¼
295 Belcher..........7@6½
385 Bullion..........8¼@8⅜
545 Benton..........5¾@5⅝
100 Belmont..........30c
730 Belle Isle..........1.65@1.70
140 Bechtel..........2.10@2.15
700 Belvidere..........1¾@1.70
350 Bodie..........21½@21
135 Bulwer..........9¼@9½
530 Black Hawk..........2.60@2.65
820 Booker..........1.10@1¼
720 California..........5½
295 Con Virginia..........5⅜@5¼
1990 Con Imperial..........2
845 Crown Point..........5¼@5½
25 Confidence..........14¾
230 Chollar..........8
150 Caledonia..........2¾@2.65
30 Challenge..........2.90
365 Con Washoe..........50c
780 Con Dorado..........1.90
200 Champion..........45@50c
50 Crœsus..........15c
170 C Pacific..........8@8½
550 Caledonia (B H)..........3¾@3½
1100 DeFrees..........5c
1235 Dudley..........1.60@2
750 D Standard..........60c
1360 Exchequer..........8¼@8½
550 Flowery..........75c
295 Gould & Curry..........12@13¼
450 Gila..........1.10@1.20
270 Grand Prize..........3.90@4
300 Goodshaw..........65@60c
220 H & Norcross..........16¾@17
800 Hussey..........10c
250 Hamburg..........80@85c
50 Hillside..........1.90
70 Independence..........2.90
310 Julia..........4.30@4.20
230 Justice..........3.70
2085 Jupiter..........2.20@2
85 Kentuck..........5
565 L Wash..........1.90@2.30
500 Leviathan..........80c
750 L Bryau..........1¼@1.35
40 Leopard..........1.05
50 Leeds..........90c
970 Mexican..........29½@29¾
150 Mackey..........1.70
100 Mounta'n View..........2.40
10 Manhattan..........2.60
40 Modoc..........1¼
400 McClinton..........1½@1.60
200 May Belle..........50c
50 Morning Star..........3
320 Mono..........9@8¾
450 Mammoth..........13½@13
200 M White..........7
100 New York..........85c
790 N Con Virginia..........8⅜@8½
1080 N Bonanza..........2@1.80
20 Northern Belle..........6
600 Navajo..........40c
80 Noonday..........4⅜@4¼
350 N Noonday..........2@2.10
505 Ophir..........31¼@32
180 Overman..........11¼@11½
600 Oriental..........75c
1150 Orient..........45@40c
150 Potosi..........5⅞
20 Phil Sheridan..........70c
110 Phenix..........3½@3¼
300 Paradise..........1¾
165 Queen Bee..........50@60c
100 Ray'd & Ely..........4½
250 Red Cloud..........75@70c
690 Savage..........15¼@15½
580 Sierra Nevada..........44@45
130 Silver Hill..........1.90
150 Succor..........1½
220 Scorpion..........2.50@2.65
50 Solid Silver..........40c
350 S Utah..........30c
190 Syndicate..........6½
720 South Bodie..........40@45c
670 Summit..........2.80@2¾
1070 S Bulwer..........1½@1.45
1050 S Standard..........25c
750 Trojan..........30@35c
2765 Tioga..........6@5¾
675 Union Con..........54@55
50 Utah..........22
300 University..........65c
1050 Vortex..........1
110 Woodville..........40@50c
2200 Ward..........1½@1.60
360 Yellow Jacket..........18½@18⅜

Monday A. M., June 23.
370 Andes..........95c@1
350 Alta..........8⅜@8½
310 Alpha..........29½@30
625 Belcher..........7⅜@7½
400 Best & Belcher..........19¼@19½
1215 Bullion..........8⅜@9¼
400 Benton..........6@5¾
730 California..........5⅜@5½
900 Con Virginia..........5⅜@5½
870 Chollar..........9@8⅝
1500 Con Imperial..........2.20@2.15
275 Confidence..........15¾@16
240 Crown Point..........5½@5⅜
1050 C Dorado..........1¾@1.80
200 Caledonia..........2.80
350 Con Washoe..........50c
140 Challenge..........3.05
1415 Exchequer..........9¼@9
1000 Fairfax..........60c
375 Flowery..........60@65c
1365 Gould & Curry..........13@13¼
570 Hale & Nor..........18½@17½
740 Justice..........3.85@3.55
1005 Julia..........4½@4.35
140 Kentuck..........5½@5¼
600 Lady Bryan..........1⅜@1.30
225 Lady Wash..........2¼@2.20
300 Leviathau..........80c
50 Morning Star..........3
275 Mackey..........1.80@1.85
150 Mountain View..........2.40
140 Maryland..........65c
415 Mexican..........32¾@31½
425 N Bonanza..........1.95@1.85
500 New York..........90c
420 Ophir..........33½@35
150 Occidental..........90c@1
300 Overman..........11¾@12¼
330 Potosi..........6⅜
150 S Potosi..........75c
1070 Savage..........17¾@17⅞
400 Silver Hill..........2.05@2¼
260 Sierra Nevada..........48@47½
100 Succor..........55c
25 Solid Silver..........45c
450 Scorpion..........2.85@2.90
1550 Trojan..........30c
630 Union Con..........58½@57½
140 Utah..........25@23½
50 Woodville..........45c
1650 Ward..........1.60@1.55
770 Yellow Jacket..........19@19⅜

AFTERNOON SESSION.

3480 Adenda..........85@70c
995 Albion..........35@40c
995 Aurora T..........45@40c
1460 Argenta..........1.20@1½
510 Bechtel..........2¼@2.05
410 Bodie..........21½@21⅜
800 Belle Isle..........1.70
2400 Booker..........1.60@1½
260 Belvidere..........1.80@1.90
375 Black Hawk..........2.30@2½
100 Crœsus..........15c
300 C Pacific..........8
50 Chieftain..........15c
1350 Champion..........50c
200 DeFrees..........5c
1650 D Standard..........1@1.10
2110 Dudley..........2½@2.45
750 Defiance..........1½
100 Endowment..........25c
145 Eureka Con..........16@16⅜
500 Fourth July..........75c
900 Glynn Dale..........75c
550 Goodshaw..........65@70c
115 Grand Prize..........3.80
1650 Gila..........1½@1.55
300 Hamburg..........85c
100 Hillside..........1½
500 Independence..........2¾@2.80
1310 Jupiter..........2.60@2½
250 Leopard..........1.20
250 M White..........7
340 Mono..........9¾@9½
1910 May Belle..........65@60c
795 McClinton..........1½
250 Mammoth..........13
1265 Noonday..........4½@4⅝
30 Northern Belle..........5⅞@6
100 New Coso..........20c
1375 N Noonday..........2¼@2½
3725 Orient..........55@70c
665 Oriental..........70@80c
450 Phenix..........3½@3¼
950 Paradise..........1.90@1¾
600 Queen Bee..........60@50c
550 Red Cloud..........75@80c
100 Raymond & Ely..........4½
130 Richer..........75c
3130 South Standard..........30@25c
1800 S Bodie..........45@40c
280 Syndicate..........6¼
615 Summit..........2⅛
270 S Bulwer..........1.40
1435 Tioga Con..........5@5⅛
25 Tuscarora..........20c
1100 University..........65@70c
420 Vortex..........1
1400 W Pacific..........40c

Tuesday A. M., June 24.
290 Alta..........7½@7¾
125 Alpha..........26@26½
520 Andes..........80@75c
500 Atlantic..........35c
750 Belcher..........7½@6⅞
800 Bullion..........8⅜@8¼
360 Baltimore Con..........75c
180 Best & Belcher..........18¾@18½
420 Beuton..........5¾@5½
315 California..........5⅜
75 Caledonia..........2.60
2325 Con Imperial..........1.95@1.90
155 Crown Point..........5⅜@5¼
240 Con Virginia..........5⅜
235 Chollar..........8¼@8
60 Challenge..........3
150 Cou Dorado..........1⅞
660 Exchequer..........8@8½
200 Flowery..........75@70c
495 Gould & Curry..........12½@12¼
345 H & Norcross..........17@17¼
990 Julia..........4.30@4.35
875 Justice..........3.60@3½
450 Leviathan..........80@75c
760 L Bryan..........1.30@1¼
300 Lady Wash..........2@1¾
615 Mexican..........29½@29
200 Margarita..........25c
480 Mackey..........1⅞
200 Mt View..........2.40@2½
50 Morning Star..........3
175 New York..........90@70c
80 North Con Vir..........8¾
385 N Bonanza..........1¾@1.80
320 Ophir..........31½
245 Overman..........11@10¼
150 Occidental..........90c
260 Potosi..........5¾@5⅝
50 Phil Sheridan..........80c
620 Savage..........16¼@16½
100 Succor..........50c
575 Scorpion..........2¾@2.85
210 Silver Hill..........2@2.05
255 Sierra Nevada..........43½@44
650 S Utah..........25c
250 S Potosi..........70@75c
200 Trojan..........25c
125 Utah..........22½@22
980 Union Con..........51@49
1475 Ward..........1.60@1.65
400 Woodville..........40c
600 Yellow Jacket..........16½@18¼

AFTERNOON SESSION.

190 Albion..........40c
3430 Addenda..........80c@1
1000 Argenta..........1⅛@1.15
550 Aurora T..........50c
950 Belle Isle..........1.70@1.65
495 Bodio..........21@20¼
370 Bechtel..........1.70@1¾
295 Bulwer..........9
1600 Booker..........1.35@1½
380 Belvidere..........1¾
310 Black Hawk..........2¾@2.10
910 Champion..........50c
200 Crœsus..........10c
45 C Pacific..........7⅞
200 Day..........35@30c
100 DeFrees..........5c
200 Defiance..........1½
1935 Dudley..........2¼@2½
1300 D Standard..........1½
30 Eureka Con..........17
100 Fourth of July..........75c
2010 Gila..........1.40@1.45
320 Grand Prize..........4@3.90
220 Glynn Dale..........70c
1880 Goodshaw..........70@65c
200 Golden Terra..........15¾
200 Hamburg..........80c
300 Hussey..........5c
400 Independence..........2¾
1740 Jupiter..........2½@2¼
70 Jackson..........5½
250 Leopard..........1.20@1.15
100 Martin White..........6½
100 Manhattan..........2½
150 Mammoth..........13¾@13½
250 Mono..........9¼@9½
475 May Belle..........70c
200 Mt Diablo..........9
50 Modoc..........1
190 McClinton..........1½@1.40
100 Navajo..........45c
50 Northern Belle..........6
320 Noonday..........4½@3¾
265 N Noonday..........2¼@2.30
2815 Orient..........70@55c
50 Oriental..........50c
200 Paradise..........1½@1.65
850 Phenix..........3¼
600 Queen Bee..........55@80c
150 Richer..........85@80c
510 Raymond & Ely..........4¼
500 Red Cloud..........75@80c
500 S Bodie..........45@40c
2300 S Standard..........30@25c
725 Syndicate..........6@6½
350 Star..........35@40c
250 Summit..........2@2.30
860 S Bulwer..........1.35@1¼
725 Tiptop..........1.15@1¼
125 Tuscarora..........20@10c
1745 Tioga..........4½@4
600 University..........70c
100 Vortex..........1
100 Wales..........2½
100 W Pacific..........50c

Wed'sday A.M., June 25.
765 Andes..........95c@1
15 Alpha..........25½
360 Alta..........7
65 B & Belcher..........17¾@18
200 Belcher..........6½@6⅝
725 Bullion..........7⅛
625 Benton..........5@4½
260 Con Dorado..........1.70
300 Con Washoe..........45@55c
465 Caledonia..........2½@2.60
320 Con Virginia..........6⅝
690 Chollar..........8@7⅞
930 California..........5½@5⅝
330 Crown Point..........5
1320 Con Imperial..........1.80@1.85
20 Confidence..........14
360 Exchequer..........7¾
200 Fairfax..........1½
300 Flowery..........70c
430 Gould & Curry..........12¾@12¼
570 Hale & Nor..........15¾@16¼
480 Julia..........4¼@4.15
925 Justice..........3¼@3½
195 Kentuck..........5@5½
100 Kossuth..........15c
300 Leviathan..........75c
1290 Lady Bryan..........1.30@1¼
140 Lady Wash..........1½@1¼
1395 Mexican..........28¼@27
150 Mackey..........1.60
400 New York..........65@75c
770 N Bonanza..........1.70@1½
295 North Con Vir..........8⅞
50 Ophir..........31½
30 Overman..........10⅜
75 Occidental..........85c
105 Potosi..........5⅞@5⅞
300 Phil Sheridan..........80@75c
785 Savage..........15½@15
580 Sierra Nevada..........44@45
600 Succor..........10@5c
400 Silver Hill..........1.80@1⅞
550 S Utah..........25c
150 S Potosi..........75c
50 Solid Silver..........45c
440 Scorpion..........2½@2.60
450 Trojan..........25c
870 Union..........47@44
35 Utah..........21@21½
520 Ward..........1½@1.55
285 Yellow Jacket..........17¾

AFTERNOON SESSION.

1805 Argenta..........1⅛@1.15
800 Aurora T..........60@70c
2465 Addenda..........95c@1⅛
220 Bodie..........21@20½
940 Belle Isle..........1.70@1⅝
1250 Booker..........1.35@1½
175 Belvidere..........1.80
685 Bechtel..........1¾@1.65
300 Bulwer..........9@10
100 Black Hawk..........2.10
300 Champion..........60c
300 Chieftain..........10c
525 Con Pacific..........7½@7
800 Crœsus..........10c
890 Dudley..........2.20@2.30
200 DeFrees..........5c
695 Defianca..........1½
600 D Standard..........1½
100 Eureka Con..........17
500 Fourth July..........80c
85 Grand Prize..........4.05@4
2460 Gila..........90c@1.20
2000 Goodshaw..........60@65c
100 Glynn Dale..........50c
1100 Hussey..........5c
80 Hamburg..........70@75c
100 Highbridge..........30c
635 Independence..........2.60@2.65
885 Jupiter..........1¾
125 Jackson..........5½
100 Leopard..........1.15
170 Manhattan..........2½
845 Mono..........9⅞@10
175 May Belle..........75c
100 Mt Diablo..........3
620 McClinton..........1.60@1½
50 Mammoth..........13½
200 Navajo..........40c
410 Noonday..........4½@3⅞
100 N Noonday..........2.10
100 Oriental..........45c
1150 Orieut..........50@55c
100 Paradise..........1.80
1600 Queen Bee..........70@75c
1250 Richer..........75@80c
255 Raymond & Ely..........4¼
100 Red Cloud..........80c
425 Summit..........2.40@2.65
570 Syndicate..........6½@6
50 Silver King..........7
150 Star..........25@35c
320 S Bodie..........40@45c
1350 South Standard..........25c
650 S Bulwer..........1.30@1¼
25 Tuscarora..........20c
1610 Tioga Con..........5¾@5½
260 Tiptop..........1.15
500 University..........65@70c
250 Vortex..........1
400 W Pacific..........50c

25 Phil Sheridan..........60c
395 Potosi..........6
280 Plutus..........2¼
500 Savage..........15⅞@15⅝
450 Succor..........60c
315 Sierra Nevada..........44
165 Silver Hill..........2¼@2
1365 Scorpion..........2½@2¾
550 S Utah..........35@30c
475 Solid Silver..........45@40c
550 Trojan..........30@35c
770 Union Con..........65@63
165 Utah..........22
1080 Ward..........1.65@1½
1200 Wells-Fargo..........25@20c
100 Woodville..........40c
80 Yellow Jacket..........18½

AFTERNOON SESSION.

1000 Argenta..........1@1.05
100 Albion..........35c
1390 Addenda..........50c
590 Black Hawk..........2¼@2½
645 Bodie..........42½@42
1250 Bechtel..........1¾@1.85
1860 Booker..........90c@1
300 Belle Isle..........1.70@1.65
185 Bulwer..........9½@10
75 Belvidere..........1¾@1.85
480 Champion..........50@45c
500 Crœsus..........5c
300 C Pacific..........8
500 Chieftain..........10c
285 Caledonia (BH)..........4½@4¼
200 Day..........35@40c
1785 Dudley..........1.45@1½
700 D Standard..........50c
950 DeFrees..........6c
80 Eureka Con..........17@17¼
125 Giant & O A..........2½@2
250 Glynn Dale..........90@80c
800 Goodshaw..........70c
50 Grand Prize..........3.90
1040 Gila..........80@85c
100 Hussey..........5c
200 Hamburg..........60c
100 Hillside..........2
900 Independence..........2¾@2.80
50 Jackson..........5¼
495 Jupiter..........1.90@1.95
100 Leeds..........75c
85 Leopard..........1@1.05
140 Manhattan..........2.60
215 Martin White..........6¼@7
480 Mammoth..........13@13½
655 McClinton..........1.40@1½
270 Mono..........10
525 May Belle..........40c
150 New Coso..........25@20c
35 Northern Belle..........6
520 Noonday..........4⅝
975 N Noonday..........2¼
2350 Navajo..........50c
1530 Oriental..........75c
1300 Orient..........30@25c
100 Paradise..........1.90
350 Phenix..........3
1150 Queen Bee..........45@50c
220 Raymond & Ely..........4½
250 Star..........40@35c
200 S Bodie..........45c
450 S Standard..........25c
620 Summit..........2.40@2½
430 Syndicate..........6@8
50 Silver King..........8
1750 S Bulwer..........95c@1.05
40 Tiptop..........1.20
100 Tuscarora..........15c
1525 Tioga Con..........3¾@4
800 University..........65c
450 Vortex..........60c
250 W Pacific..........40c
170 Scorpion..........2½@2.60
220 Solid Silver..........45c
85 Silver Hill..........1.80
50 S Utah..........25c
1775 Trojan..........25@30c
40 Utah..........21¾@22½
910 Union Con..........43@45
300 Woodville..........30c
300 Ward..........1.65
350 Yellow Jacket..........17¼@17

AFTERNOON SESSION.

400 Albion..........40@35c
800 Argenta..........1.10@1.15
650 Aurora T..........65@75c
1275 Addenda..........95c@1
295 Bodie..........22@22¼
250 Bechtel..........1¾@1.80
1475 Belle Isle..........1¼@1.20
40 Bulwer..........10
1180 Booker..........1¼@1.30
60 Black Hawk..........2¼@2.20
100 Belvidere..........1.85
200 Chieftain..........50c
85 C Pacific..........7½@7½
1500 Crœsus..........10c
950 Champion..........50c
200 Caledonia (B H)..........4
150 Day..........35@30c
100 DeFrees..........5c
975 Dudley..........1.90@2
650 Defiance..........1½
725 D Standard..........1.20@1.10
100 Eureka Con..........16½
100 Fourth July..........75c
405 Grand Prize..........4.10@4
150 Gila..........1.15@1.10
615 Goodshaw..........60@65c
300 Glynn Dale..........70c
900 Hussey..........10@5c
250 Hamburg..........60@50c
885 Independence..........2.60@2.40
2170 Jupiter..........2½@2¼
200 Jackson..........5
120 Leopard..........1.15
300 Leeds..........90c@1
535 May Belle..........60c
260 Mono..........11¼@11½
65 M White..........7
50 Mammoth..........13
70 Mt Diablo..........2¾@3
200 McClinton..........1.40@1.35
300 Navajo..........35c
50 Northern Belle..........6
600 N Noonday..........2.10@2
2690 Oriental..........50@55c
600 Paradise..........1¾@1.90
1930 Queen Bee..........80c@1
550 Richer..........85c
260 Red Cloud..........75c
100 Raymond & Ely..........4
60 Silver King..........7@7½
550 Summit..........2½@2.60
240 Syndicate..........8
1100 S Bulwer..........1.30@1.35
490 S Bodie..........35@40c
800 S Standard..........25@20c
600 Tuscarora..........10@20c
365 Tiptop..........1.15@1¼
1995 Tioga Con..........6¾@6¼
700 University..........70@65c
750 Vortex..........75@85c
50 W Pacific..........50c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., June 19.
230 Alta..........8¾@8½
130 Alpha..........25½
200 Atlantic..........50c
735 Andes..........70@65c
110 Best & Belcher..........17¾
1485 Belcher..........6¼@6½
1175 Bullion..........8½@8¼
1140 Benton..........6½@6
280 Crown Point..........5½@5⅝
525 California..........5⅜@5¼
30 Chollar..........8¼
925 Con Virginia..........5½@5
2755 Con Imperial..........1.85@1.90
310 Caledonia..........2.80@2.60
100 Confidence..........14½@14⅜
40 Challenge..........2.90
300 Con Washoe..........40c
580 Con Dorado..........2.10
100 C P Raviue..........25c
1125 Exchequer..........8@7⅞
10 Flowery..........75c
350 Gould & Curry..........11¾@12
320 Hale & Nor..........16⅝@16⅞
295 Julia..........4.30@4.40
355 Justice..........3⅞@3.80
220 Kentuck..........5
225 Kossuth..........20c
2650 Lady Bryan..........1.35@1¼
700 Leviathan..........75c
250 Lady Wash..........2.20@1.90
880 Mexican..........33½@33
280 Maiyland..........50c
400 Mt View..........2⅝@2.40
1250 New York..........1
65 North Con Vir..........8½@8¼
495 N Bonanza..........2.05@2
440 Ophir..........32½@32
170 Overman..........12@11½
200 Occidental..........1

Thursday A.M., June 26.
345 Alpha..........25½@26
285 Alta..........6¾
280 Best & Belcher..........18½@18¼
460 Bullion..........7¾@7⅞
940 Belcher..........6½@6¼
370 Benton..........5@4.90
180 California..........5⅜@5½
800 Crown Point..........5@4¾
490 Con Imperial..........1.80@1.85
190 Chollar..........7⅞
80 Con Virginia..........5⅜@5½
270 Caledonia..........2½@2.60
50 Challenge..........2.90
300 C Dorado..........1.70
435 Exchequer..........7⅝@7½
650 Fairfax..........1½
600 Flowery..........65@60c
635 Gould & Curry..........12½@12
425 Hale & Nor..........16½@16
285 Julia..........4@3.90
440 Justica..........4.20@4.10
250 Kossuth..........20c
255 Ladv Wash..........1¾@1.80
560 Leviathan..........75@70c
860 L Bryan..........1¼@1.30
450 Mackey..........1.40@1.30
1790 Mexican..........27½@26¾
150 Mt View..........2.30@2.40
90 New York..........75@80c
490 N Bonanza..........1.40@1.60
15 N Con Vir..........8⅜@3⅞
225 Ophir..........31½@31⅞
125 Overman..........10½@10
100 Phil Sheridan..........65@75c
320 Potosi..........5½@5¼
910 Savage..........15¼@15⅜
335 Sierra Nevada..........45@45¼
600 Succor..........10@15c
250 S Potosi..........75c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Andes S M Co	Nevada	12	25	May 5	June 11	July 1	M Landers	309 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Bullion M Co	Nevada	9	1 00	May 6	June 9	June 30	Joseph Gruff	418 California st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
N Comstock S M Co	Nevada	1	05	May 30	July 2	July 23	D L Thomas	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
Raymond & Ely M Co	Nevada	11	1 00	Apr 23	June 2	July 1	Jos Roberts, Jr	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
South Bulwer G M Co	California	3	10	May 8	June 12	July 3	William Stuart	320 Sansome st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery s t
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery s t
Tioga Con M Co	California	5	20	Apr 3	May 8	May 28	W H Lent	309 Montgomery s t
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Ajax G & S M Co	California	2	10	June 11	July 14	Aug 1	A F Main	309 California st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 1	Jno Crockett	203 Bush st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Armstrong G M Co	California	1	05	June 11	July 14	Aug 1	J W Pew	310 Pine st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Plue st
Champion M Co	California	3	15	Apr 15	June 6	July 7	Jno Crockett	203 Bush st
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	July 23	B W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Morizio	328 Montgomery st
Mayflower S M Co	Nevada	1	05	Apr 1	June 6	June 30	J W Pew	310 Pine st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Occidental Con Grav M Co	California	1	07	May 19	June 23	July 12	W T Smith	402 Montgomery st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Planet Grav M Co	California	—	02	May 19	June 21	July 15	M Byrne, Jr	Grass Valley
Rocky Bar G M Co	California	1	10	May 26	June 28	July 15	G W Hill	Grass Valley
Seg Europa M Co	Nevada	1	25	Apr 4	June 27	July 14	R B Noyes	240 Montgomery st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Silver State M Co	Nevada	10	06	May 20	June 24	July 22	A Halsey	314 Montgomery st
Swansea M Co	California	1	10	June 14	July 21	Aug 11	F N Delaney	315 California st
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st
Union G & S M Co	California	20	05	June 9	July 10	July 26	R Vincent	Grass Valley

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Eagle S M & M Co	Nevada	J E Dixon	20 S F Stock Ex	Annual	July 7
Union G & S M Co.	California	Wm Rogers	Grass Valley	Annual	July 5

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
California M Co	Nevada	O P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	May 15
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

Pacific Board—Latest Sales.

Wed'sday A.M., June 25.
20 Alta..........7½@6¾
310 Belcher..........6⅝@6¾
10 Best & Belcher..........18
100 Bechtel..........1.85
100 Booker..........1⅜
385 Bullion..........7⅞@8
140 Chollar..........7⅞@8
10 Con Virginia..........5.30
300 Con Imperial..........1.80
90 Crown Point..........5@5.05
85 Gould & Curry..........12½
120 Hale & Nor..........16¼@16
60 Julia..........4¼@4 20
60 Mexican..........27¼@26½
150 Ophir..........31½@31⅜
100 Potosi..........5½@5⅝
230 Savage..........15⅝
20 Sierra Nevada..........44
20 Silver Hill..........1.90
760 Tiger (B)..........75c

50 W Pacific.....50c	265 Lady Bryan.....1½
50 Yellow Jacket.....17½	50 Martin White.....6½
AFTERNOON SESSION.	20 Mexican.....25½
10 Alpha.....26	300 N Standard.....2
170 Benton.....4½@4½	30 Ophir.....30
10 Black Hawk.....2½	1150 Succor.....10c
70 Bullion.....7½@7½	10 Savage.....15
110 Crown Point.....4.85@5	200 Silver Hill.....1.80
50 California.....5½	750 Tiger (B).....75c
50 Caledonia.....2.40	10 Union Con.....42½
100 Gila.....1	10 Utah.....21
65 Gould & Curry.....11½	300 Walker.....55@60c
270 Justice.....3	40 Yellow Jacket.....17½@16½

California Board—Latest Sales.

Wed'sday A.M., June 25.	AFTERNOON SESSION.
	30 Alpha.....25
20 Alpha.....25½	45 Alta.....7½
50 Alta.....7½@7½	300 Almaden Q.....1@1½
40 Belcher.....6½@6½	100 Ætna.....37½c
30 Best & Belcher.....17½@17½	40 Belcher.....6½
40 Bullion.....7½	30 Best & Belcher.....17½@17½
200 Brilliant.....5@10c	50 Bullion.....7½@7½
200 Con Washoe.....40c	80 California.....5½@5½
30 California.....5½	120 Con Virginia.....5½
40 Con Virginia.....5½	320 Con Imperial.....1.70@1.80
200 Con Imperial.....1½	55 Crown Point.....5
60 Crown Point.....5@5½	120 Caledonia.....2.90
55 Challenge.....2.90@2.95	1500 Coso Con.....6@10c
2200 Coso Con.....7@5c	90 Exchequer.....7½@7½
250 Defiance.....1.65	500 Enterprise.....1½
45 Exchequer.....7½	30 Gould & Curry.....11½
50 Gould & Curry.....12½@12½	200 Golden Chariot.....10c
40 Hale & Nor.....16½@16½	60 Hale & Nor.....15½@15½
70 Julia.....4½@4.20	70 Julia.....4.05@4.10
100 Justice.....3.30@3.40	50 Justice.....3½@3.20
550 Kossuth.....20@25c	50 Mexican.....25½@25½
50 Lady Bryan.....1.30	250 North Carson.....45@40c
100 Monumental.....3c	100 Newark.....15c
45 Mexican.....26½@26½	30 Ophir.....29½
390 North Carson.....42½c	500 Orient.....70c
30 Ophir.....31½@31½	40 Savage.....14½@14½
50 Savage.....15½@15½	300 S Utah.....26c
115 Senator.....30c	100 Trojan.....25c
50 Silver Jacket.....60c	400 Tiger (W).....1½
50 Succor.....3½c	300 Tiger (B).....75c
450 Tiger.....70c	50 Union Con.....44@44½
500 Wm Penn.....25c	30 Yellow Jacket.....17½

The Mining Share Market.

Failnre of a crosscut and non-appearance of ore bodies in levels where expected, bave caused disappointment and a depression in certain quarters, from wbich the market fails to rally. Although the controlling powers seem to have supported their expectations witb an outlay of coin, the fear of tbe "gift-bearing Greeks" bas prevented a general movement on tbe part of outsiders, and a feeling of safety exists in spite of the dull and weak market. Rich finds and glowing accounts do not appear to excite the cupidity of investors so much as formerly, and a common sense caution seems now to pervade the minds of those who heretofore have passed the time dreaming of "Aladdin's lamp" and sudden wealth througb wildcat sources.

Bullion Product.

The bullion product of tbe United States for 1878 was, in ronnd numbers, $85,000,000. There was a falling off in Nevada of about $16,700,000, but a general increase in the national production outside tbe Comstock.

Russian possessions, increasing slowly, and now some $18,000,000 per annum. Hungary and Trannsylvania; decreasing now about $1,300,000 per annum. Asia, irregular; probably $2,000,000 can be expected, and about one-half tbis amount from Africa. Soutb America; decreasing rapidly, witb a present total production not to exceed $8,000,000 per annum. Australia; decreasing, with a present annual production of abont $20,000,000. New Zealand; steady, $6,000,000 per annum.

As to silver, Great Britain is steadily producing about 600,000 ounces per annum; the Norway mines about 200,000 ounces, and the Sala mine, in Sweden, about 24,000 ounces per annum.

Tbe Scbemnitz district, tbe main producer of tbe Hungary, Transylvania and Banat silver mines is fallng off, aud its annual production of 1,000,000 ounces, is decreasing. The Freiberg mines, of Saxony, now yield some 750,000 pounds per annum, and are sustaining this yield, but the rest of Europe does not probably produce 300,000 ounces per annum.

Mexican production is steadily decreasing, and now does not exceed 18,000,000 ounces per annum, against quadruple that 40 years since. Tbe yield of Peru, Chile and other Soutb and Central American States, is rapidly decreasing, and togetber does not exceed 6,650,000 ounces, or about one-balf tbe average annual yield of Cerro de Rasco mines for a century after tbeir discovery.

ADULTERATIONS OF FRENCH WINES.—It seems tbat the Frencb government is awaking to tbe adulteration of wine with fucbsine. The government has heretofore taken measures to stop it in tbe home nsed wine, and now it is seen that the exportation of this adulterated stuff must sooner or later destroy the foreign trade in Frencb wine. Probably tbe rapid growth of demand for pure California wine is aiding in bringing attention to tbis matter. The action by tbe French government is taken too late, but seems to be vigorously pushed. A large consignment of wine adulterated with fuchsine has just heen seized at Malaga, where tbey bad arrived from Valence. The Ministry has consequently directed the authorities at all tbe French ports, and on the Spanish frontier, to cause all wines intended for export to he analyzed, and to allow only sucb to pass as are found pure.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

RICH ROCK.—*Dispatch*, June 21: Mr. Owen Kelly, proprietor of the Kelly mine, on Murphy's ridge, showed us an extraordinary rich piece of quartz which he had taken from his claim, only a short distance below the surface, last week, which contained a large amount of gold, varying in size from the point of a pin to that of an ordinary pea. The ledge, he says, is 15 ft wide at the top, and gives every indication of increasing in width as they go down. He is now running a tunnel for the purpose of tapping the ledge at a depth of about 1,500 ft from the eurface, and now has only about 100 ft further to run before striking the main body of rock.

ITEMS.—*Ledger*, June 21: The Amador gravel company, whose claim is situated two miles east of Jackson, are operating on the gravel bank with two "giants" and 400 inches of water. The ore from the Lorraine quartz mine, near Jackson Gate, recently hauled to the Moore mill and crushed, surrendered between $6 and $7 per ton. The rock so far crushed from Millo's claim is reported to have yielded a paying quantity of gold.

BUTTE.

ITEMS.—*Record*, June 21: The stay of injunction in the Keyes' debris suit expired yesterday, and we understand that Sheriff Harkey will serve the official papers on the mining companies to-day.

MINING NOTES.—*Mercury*, June 20: San Francisco capitalists have organized a mining company under the title of the Alki mining company, and began operations upon the West Branch, about two and one-fourth miles from Dogtown. Numerous nuggets have been taken from the mine, the largest weighing two ounces and the smallest worth $1.

CALAVERAS.

ITEMS.—*Chronicle*, June 21: A clean-up lately made at the Mammoth hydraulic, Tunnel ridge, yielded some hundreds of ounces. Another clean-up was lately made at the Bonanza hydraulic, Miller & Co. proprietors. The dividends declared by the Bonanza during the year are said to have aggregated the sum of $2,000 per share.

EL DORADO.

NOTES.—*Democrat*, June 21: Encouraging developments have been made at the Placerville gold quartz mining company's (the old Pacific) claim. The company have purchased the St. Lawrence mill and are setting it up. The Index mine, about one mile west of Spanish flat, has reached a ledge about eight ft wide, with footwall of slate and hanging wall of slate streaked with serpentine, and from this ledge have been already taken out a number of very handsome samples of quartz, in which the free gold is liberally disseminated.

MONO.

SYNDICATE.—*Standard*, June 19: The Syndicate company is out of debt and has $20,000 in the treasury, besides $10,000 worth of supplies ahead. A crosscut is to be run from the north line of the Tioga company's claim across the bluff from the Bechtel to the Blackhawk.

MARYLAND CON.—An increased force of miners has been put on in this mine, and now two shifts of men have been set at work.

MAMMOTH.—*News*, June 19: We learn that another rich body of gold-bearing rock was struck in the winze going down from the second crosscut in the middle tunnel of the Mammoth mine, at Lake district. Our informant states that the present find exceeds in richness any ever discovered in this really wonderful mine.

NEVADA.

HYDRAULIC MINING.—Grass Valley *Union*, June 21: There are very few hydraulic claims that will pay by drifting, as the ground will yield so little gold to the cubic yard that a very large amount of earth must be removed by the speedy and cheap process of using a large head of water. To drift such claims would be a dead loss to the claim owner. They must be worked by hydraulic process, or not at all. There are some claims that of necessity must be drifted, as the amount of earth lying over the pay channel is too great to be removed; but these claims are invariably richer than the hydraulic ones.

ITEMS.—*Foothill Tidings*, June 21: Wilson Foster and John Orissel will soon commence operations in their quartz lead near the Yuba mine, above Washington. They have a vein of very rich quartz about four inches thick at the top gradually widening as they go down, so that at a depth of 14 ft it is about 18 inches wide. The Hathaway company (gravel), near Omega, are running night and day. They have passed through the bar heavy boulders on the front and have come into splendid-looking blue gravel, containing many rich nuggets of gold. Their supply of water will last six weeks or two months longer. The Live Yankee mine is developing finely. They have 60 tons or more on the dump, and are taking out three tons each shift as they drive along the ledge. A clean-up of $2,200 was made from ore from the Scadden Flat mine Wednesday. The yield per load was not ascertained, but the run is stated to be a favorable one. Talbot's gravel claim, on Gold flat, is being worked regularly by six or more men. Hydraulicking has been abandoned and drifting commenced at the south end of the channel. The gravel looks well. The tunnel of the Planet gravel claim is now in a distance of 1,880 ft, at which point an upraise is being made into gravel. Drifts will be run to prospect the claim. A mine is being opened under the very heart of Nevada City, and promises well. The Orleans mill is now running through a crushing of Centennial rock.

ORIENTAL.—Nevada City *Transcript:* The mill is running steadily on No. 1 ore, and the plates are looking well. They are pushing the work on the fifth and sixth levels with indications of making a rich strike soon. The vein is nine ft wide at bottom of shaft in ore assaying $24 per ton.

PLACER.

THE ALHAMBRA.—*Argus*, June 21: The Alhambra mining company are now erecting a 10-stamp mill and hoisting works about three-fourths of a mile east of Penryn.

ITEMS.—*Herald*, June 21: At Independence hill the Superintendent of the old Metcalf & Reno claims, in 64 days (24 hours each), with a 500-inch stream, 300-ft pressure, has washed eight acres, averaging 75 ft deep, which will give an average of over 10,000 cubic yards of gravel per day. Though this ground will only average three and one-third cents per yard, the total purchase money and expense of fitting up have already been paid this season. The cost per day was $120, including water. The sluices are 40 inches wide, with 12 inches grade to the 12 ft; undercurrents 100 inches wide and 50 ft long, with grade 18 inches to 12 ft.

SIERRA.

DERBEC MINING COMPANY.—Downieville *Messenger*, June 21: This company has put in three shifts of eight hours each and pay $2.50 per day.

BONANZA TUNNEL.—One thousand one hundred ft have been completed. The facewall gravel; 50 to 00 ft of tunnel are being made every week.

PLUMAS EUREKA.—From Dr. Leonard we learn that the Plumas Eureka mine is now giving employment to 250 men. A new 40-stamp mill, run by a turbine wheel, has just been completed, and will crush about 100 tons of ore daily.

SHASTA.

BULLYCHOOP.—Reading *Independent*, June 10: Morning Star mine is having a five-stamp mill erected. Red Bluff mine has 100 tons of rich ore on the dump. A pack-train will carry the ore two miles to the mill. The Bullychoop company are running a tunnel to tap their ledge at a depth of 300 ft.

TUOLUMNE.

SILVER ORE.—*Union-Democrat*, June 21: James Tullock came to town on Wednesday, after an absence of two months at the mining claims he is developing, about 60 miles east of Sonora. He brought ore from two different veins which carry silver and promise very well from assays already made and will have the ores further tested.

YUBA.

LONE TREE HILL.—J. M. C. Jasper has shown the Wheatland *Recorder* a specimen from the newly-discovered quartz mine, located about eight miles east of Wheatland, in the vicinity of the Lone Tree hill. It is claimed that it is the richest quartz discovery ever made in this section. The ledge runs in an easterly and westerly direction, and pitches north. The shaft, from which this piece was taken, is now down 50 ft. The ledge is two and a half ft wide. A crushing was made of a piece not much larger than a pound weight, in a hand mortar, and yielded about $1.50 worth of gold.

NEVADA.

WASHOE DISTRICT.

SIERRA NEVADA-MEXICAN-UNION SHAFT CO.—Gold Hill *News*, June 25: Shaft has attained 145 ft below 1700 level of Sierra Nevada, passing through hard blasting porphyry.

ALTA.—North drift, on 1500 level, is 30 ft in Lady Washington ground, and in quartz. North drift, 1750 level, has been run 128 ft, touching the clay of the vein, and turned parallel with ledge.

SUTRO TUNNEL.—The sub-drain has not been completed clear up to the Savage connection, but the boxes have been laid and connections made with the mines ready to conduct the water off.

TROJAN.—Northeast drift, 3d level, is in lively quartz. North drift, 2d level, is in low grade ore. Total length, 100 ft.

BULLION.—Bottom is in hard vein porphyry, carrying seams of clay and quartz.

OPHIR.—Tank at 1465 station completed, ready for connection with the Sutro tunnel; 1200 bob-station enlarged and retimbered. Good milling ore and fair vein matter is being encountered.

UNION CON.—Incline in 83 ft, the face in cap rock, containing richer stringers of quartz.

BELCHER.—The south crosscut, 2560 level, has struck more quartz, and found some water.

NORTH BONANZA.—An upraise is commenced to meet the Rule winze and connect it with the 200 level. South drift, into Flowery ground, has been swung around to the west to reach the edge of the ledge.

OVERMAN.—Vertical winze, below 1000 level, is encountering much water. Heavy flow of water in Forman shaft—150,000 gallons daily.

SIERRA NEVADA.—Heavy flow of water in Incline—200,000 gallons daily. Final shipment of bullion for June will be made July 1st.

CON. VIRGINIA.—Shipped last evening, 12 bars bullion valued at $57,233.39. Total for month, $101,515.44. Joint west drift, 850 level, is being pushed through a soft, moist formation, which requires timbering. South drift, 2150 level, is in 200 ft, with face in vein matter, carrying quartz in stringers.

JUSTICE.—Veins and spots of ore encountered on the 1300 level, in crosscut five, and in the lateral drift.

SAVAGE.—Connection with Gould & Curry on 1600 level completed and all ready for Sutro tunnel. Water in mine remains stationary.

CON. IMPERIAL.—Drift on 2600 level averages six ft per day along wall of the vein; total length, 306 ft.

CALEDONIA.—The Forman shaft is down 750 ft, encountering a heavy flow of water.

GOULD & CURRY.—Face of joint east crosscut, 1700 level, is 900 ft from lateral drift.

WARD.—Strong flow of water in bottom of shaft, which is down 1,520 ft.

SILVER HILL.—Breaking a pump flooded the mine last Friday week to 90 ft. Upper workings yielding low-grade ore.

LADY BRYAN.—East drift, on 750 level, is in vein porphyry carrying streaks of quartz. Pumps lowered to 750 level, air pipes carried down and shaft partitioned for ventilation.

YELLOW JACKET.—East and west drifts both cutting hard porphyry.

UTAH.—Excavations for a balance-bob in the Incline have been commenced.

BROPHY.—Tunnel shows indications of nearing the vein.

EUREKA DISTRICT.

BELMONT.—Some rich ore bodies are being opened up in this mine. Specimens brought in show a yield as high as $1,000 to the ton in silver when run through the mill.

GOOD HOPE DISTRICT.

AURORA.—This mine has an incline 140 ft deep and drift of 50 ft on a four-ft ledge; all milling ore assaying from $20 to $2,000 per ton. The mineral is ruby, native and stephenite. There are 40 tons of ore on the dumps, which will mill from $200 to $500 per ton.

PAGE & KELLEY.—This mine adjoins the Aurora. Incline 130 ft deep on ledge and 25 ft of drift at bottom. Vein between walls is four ft thick, 20 inches of it ore; assay from $60 to $2,700.

YOU AND I.—Carries same character of ore as Aurora; three tons of the ore worked $200 per ton.

JUNGO DISTRICT.

THE mines in this district are reported rich and permanent. The leads are well defined and the ores rich enough to pay for shipping them.

PARADISE DISTRICT.

BULLION.—*Silver State*, June 21: Bullion valued at $1,800 was received at Wells, Fargo & Co.'s office here yesterday from the Sedan mill, Paradise valley.

SOLID SILVER.—*Sentinel*, June 21: Shaft down 40 ft in a four and one-half ft vein, and plenty of free milling ore taken out.

BIG PRIZE.—A rich body of ore is reported to have been struck. A piece was shown the size of a hen's egg and more than half silver.

PIOCHE DISTRICT.

BLUE BELL.—A rich body of ore has been struck at a depth of 80 ft.

MAYFLOWER.—The ore in the stopes, north drift, averages five and one-half ft in width; assays lately made range from $167 to $235 per ton.

HILLSIDE furnace is running steadily. The assay value of bullion output in May amounted to $65,102.83. In the west drift, fifth level, a body of ore has been encountered the same as that above it.

A LEDGE has been discovered in Buffalo canyon, four miles from Buffalo station, on the Idaho road; ore assay, $155.16 per ton.

UNION DISTRICT.

MINES upon which croppings assayed only $20 to $25 are found to yield at 10 ft from surface ore at $60 per ton.

ARIZONA.

MINING NOTES.—*Silver Belt*, June 18: We understand that at the depth of 150 ft a great improvement is visible in the ore body of the Independence lode. It is richer than it has been heretofore, is more compact and more abundant in quantity. McCargil, Martin and McCarthy are running a drift into the Continental from the bottom of another shaft near the gulch, and will strike the Continental vein at about 40 ft from the surface. Mr. H. C. Hoffman, of McMillen, has just had 55 pounds of ore specimens worked at the Haskin mill, and as the product was 19 pounds six ounces of bullion, nearly 800 fine, our readers will understand that the Globe district ores are unusually rich. The specimens referred to came from different mines in the district and averaged one-third pure silver.

MOHAVE COUNTY.—Phœnix *Herald*, June 18: Mohave county is said to contain some of the richest mineral deposits in this Territory. The Congress mine, in Cedar valley, is now down 74 ft, but is to be put down to a depth of 200 ft. Some 35 tons of ore have been shipped to San Francisco averaging $478 to the ton. The ore seam is 10 ft wide between granite and porphyry. Hoisting works will soon be erected. The miners are well pleased with their property and think they have a bonanza.

SILVER KING MINE.—*Sentinel*, June 14: The new working shaft is down 107 ft, vertically, and will strike the principal vein, which inclines at an angle of 45°, in about 25 ft more. The incline following the vein is down 265 ft. Complete steam hoisting works are on the ground and would have been working before now but that the shive was sent by mistake to Silver Hill, Nevada. The new shaft is now 50 ft below the fourth level, on which level the vein is 77 ft wide. The ore-breast on the third level measures 42 ft. The walls are perfect and of syenitic granite. Plenty of fuel and water, the amount of ore inexhaustible, 5,000 tons on the dump and 30 tons per day are reduced to concentrations. Sixteen thousand pounds were sent to San Francisco last week.

TOMBSTONE DISTRICT.—*Star*, June 14: Eight bars of bullion, valued at $18,744, have just been received by Safford, Hudson & Co., for Gov. Safford, of Philadelphia. This is the first shipment of bullion by the Tombstone company, and is the result of third class ore. There is another lot of about $20,000 at the mill awaiting transportation, and it is estimated that ere many days the Tombstone mill will run out at the rate of $5,000 to $10,000 per day.

THE HERSHAW MINES.—They consist of a group of nine mines, the Hardshell, second eastern extension of the Hardshell, Sotella, Hermoso, Salvador, South King, Fagan, Scotty, and Surveyor. There are seven cuts on the Hermoso. Eight hundred ft of the claim shows excellent ore. The depth of the main shaft is 25 ft. The ore vein is 18 ft wide, and grows richer with depth. The Salvador has two cuts, one seven and the other eight ft in depth, with same character of ore as the Hermoso. The Hardshell has a cut 30 ft across the ledge, with 30 tons of ore on the dump. This cut is on the south end of the mine, in a deep gulch. From this point a tunnel will be run in on the ledge. There are two more cuts 200 ft from this; both show good ore. The Hardshell has a 12-ft shaft, all on ore; the width is not yet ascertained. Horn silver has been found in various quantities at all points of development. The South King has two cuts, the Fagan one. The character of the ore is low grade, but in large quantities. All of these properties are free milling ore, situated within a radius of one mile. The mill site is only one and a half miles from the farthest location of the group. Water and timber are plenty; oak on the highlands, ash and cottonwood in the valley.

COLORADO.

LADY GAY.—*Silver Cliff Prospector*, June 13: At the distance of seven ft in this lode, a vein of galena and gray copper has been encountered. One piece weighing 88 pounds taken from this lode, can be seen at Mr. Mulkey's place.

WYANDOTTE CHIEF.—A recent assay in this lode ran as high as $1,100.

JAYHAWKER.—An assay of rock taken from this lode ran $4,317.76.

ROCKY MOUNTAIN.—This lode is now working in an 18-inch vein.

CENTRAL CITY.—The *Golden Globe* says: Three men are working the placer mines at the mouth of the canyon, cleaning up $60 to $80 per week.

BOULDER.—*News*, June 13: We were shown fine specimens of manguisite and tellurium, from the Logan mine, on Sugar Loaf. Considerable ore is coming out, running as high as $10.

DOLLY VARDEN.—The returns from the last mill run of a large lot of ore was as follows: First class, 024 ounces; second class, 313 ounces; third class, 200 ounces.

MASTODON.—Fine mineral has been struck.

SAN JUAN BULLION CO.—Tunnel on the Loma lode is in 125 ft, and good ore is being taken out.

BIG GIANT.—Shaft down 25 ft and tunnel 30 ft. Has a good streak of galena and gray copper.

RED ELEPHANT.—A vein of ore has been intersected in this mine, which is 20 inches solid, and 24 inches scattered. Mineral assays 150 to 200 ounces of silver per ton.

IDAHO.

MAMMOTH MINE.—*World*, June 17: This mine, on Summit Flat, has between 700 and 800 tons of good ore on the dump. The mill is running.

BONANZA CITY.—About 150 men are prospecting in the Saw-Tooth range, and have found some very rich float. Between 1,000 and 1,500 men are prospecting in the Salmon river country.

ITEMS.—The Buzz Fuzz shaft is down 25 ft, and a small feeder, that contains gold, has been crossed. The mine will be reached in about five more feet. Mr. James Freaner has discovered a ledge somewhere near the head of Thorn Creek ditch, that assays $32 per ton in silver.

YANKEE FORK.—Immigration to this section has been immense during the past three or four months, but there are now scarcely 300 people in both Challis and Bonanza City. Men accustomed to mining camps can see at a glance that there is nothing to do, and many of them have gone to Montana, Salmon river mines and other portions of Idaho. The mines are rich beyond anything that has been said of them, but with the exception of two, are non-producing, and must necessarily be so until their owners can erect mills. A small quantity of ore has been sacked and shipped to Salt Lake from the Norton mine, and the yield was very large. About $1,500 per ton is considered a fair average of the ore already taken from this mine.

UTAH.

BULLION.—*Tribune*, June 19: The receipts of refined bullion at the Union Pacific Express office yesterday, were six bars Ontario, $5,197.32; two bars Silver Reef, $2,511.70; total, $7,709.02. Wells, Fargo & Co. received bullion as follows yesterday: Four bars Horn Silver, $5,503.97; one bar refined silver from Silver Reef, $1,591.02; total, $7,184.90. Their shipments were one bar Horn Silver, valued at $2,000.

WYOMING.

NORTH PARK.—A special from Laramie says: There is great excitement here over the rich silver mines discovered near this city, on the rim of North Park. A great many specimens of ores, both carbonate and chlorides, have been brought into town this week, all of which assay from $200 to $600 per ton. An official assay by the Territorial Assayer certifies the ore to be lead carbonates, and contains 443 ounces of silver per ton. Experienced miners are confident that this new mining district is fully as rich and extensive as Leadville. The new camp is about 75 miles from here, and easily reached by teams. People are rushing in there from all around this section of country.

Bullion Shipments.

Since our last issue we have noticed tbe following shipments:

Con. Virginia, June 17th, $44,282.05; Hillside, June 22d, $4,250; June 24th, $4,672.24; Belle Isle, June 23d, $22,000; Ophir, June 21st, $20,044.59; Northern Belle, June 16th, $2,276.96; June 18th, $2,341.41; June 21st, $4,672.24; Independence, June 23d, $13,000; California, June 19th, $45,880.16; Indian Queen, June 16th, $4,318.44; Bodie Con., June 24th, $37,000; Standard, June 20th, $21,932.16; Keuton, June 21st, $1,927.90; Alexander, June 19th, $7,096.

THE President bas witbdrawn the nomination of George W. McCrary for the Judgeship made vacant by tbe resignation of Judge Dillon.

The Telluride Ores of Gold.—No. 3.

[Thesis by RUSSELL L. DUNN, College of Mines, University of California.]

Mines and Mining.

The mining of the telluride ores of gold has on the whole been a fairly profitable business, and it is safe to say that the proportion of failuree is no greater in this than in any other class of mining enterprise in the same region, the common belief amoug mining men notwithstanding. Thie feeling of failure is perhaps, in some measure, due to basing expectations of constant yield on the extraordinary richness of the surface pockets, an expectation the history of mining has shown to be very rarely fulfilled. The truth of the matter is, that of the veins located on with fair indications and surface prospects, a greater proportion yield higher returne than is the case with the ordinary class of gold-bearing veins. Consider California: How many of the almost innumerahle lodes worked have paid even expenses? Again, the average value of the ore of the former is much higher, $20 ore heing a very low grade for it, while the same amount in a free gold-hearing rock would he considered fair. Colorado is the hest place to study the peculiarities of the mining, as it is carried ou there more extensively than anywhere else, more correctly and with a greater measure of success, owing to more extensive deposits.

The first discovery was of what is now called the Red Cloud mine, on Gold hill in Boulder county, at some time in the autumn of 1872. Free gold-bearing veins had been worked here, and after yielding fairly for a time had ceased to give any ore and heen ahandoned, and the future of the district seemed to rest on its silver mines, among which the Caribou and Native Silver are prominent. A couple of gold miners who stuck to the district when it was being deeerted hy almost everybody else, found some peculiar looking float in one of the streams and had it assayed. The ton valuation ran up into the thousands. The miners, searching for the source, found the outcrop of the Red Cloud vein underneath 12 feet of soil. *The vein was enormously rich where they commenced to eink on it, and 10 assays made on ore taken at intervals in the first 25 feet varied from $167.87 to $25,942.31 per ton, the average gold being $6,468.47 and the average silver, $2,823.63. The discovery immediately attracted a great deal of attention and caused the usual rush to the locality. Within the next two or three years all of the really valuahle mines and hundreds of others were located, the latter comprising far more than the usual numher of wildcats.

Of these mines only ahout 20 havc paid much, due in a measure to their more thorough development. Most of the so-called mines are nothing hut prospect holes sunk around a bunch of ore, the owners having failed to sell them at an excessive figure duriug the first excitement, have lacked the enterprise and linancial ability to explore their property. Unless a rich pocket or chimney is struck on commencing work the opening of one of these mines is a very tedious and discouraging operation. It may be said though of all that have reached a depth of 100 feet, the majority have at least paid expenses. Very few have heen explored much heyond 400 feet, and at that depth the ore seems very poor in tellurides and is not as a rule workahle with profit. It was at thie and greater depths that the mines of Nagyag and Offenbanya are said to have paid best.

The grade of ore yielded averages high. Comparatively large amounts of first-class ore, ranging in value from $700 to $15,000 and upward per ton have been taken out; of second-olass ore, or ore worth from $200 to $600 per ton, a still larger amount has heen ohtained; while third-class ore, $15, $20, $30, etc., rock forms a good proportion of the entire vein matter.

The description and history of some of the mines, with their yield of metal, will perhaps show better thau any general account, the peculiarities and value of these deposits.

The Melvina, discovered in the Gold Hill district in the summer of 1875, is remarkable as yielding the largest proportionate profit of any mine in the couutry. For a long time the net profits were 80% of the gross yield. In the firet 15 months it was worked, it produced 151.035 tons of ore, which sold at the mine to the smelters for $84,600, an average of $560 per ton. [The assay valuation must have heen at least 10% higher, making the average value per ton ahout $615.] The total outlay during the same period was only $8,000. In 33 months the mine produced $175,000. Small lots of ore sold at rates varying from $10,000 to $18,000 per ton. Nearly all of the ore ahove mentioned was taken out iu sinking the shaft, which followed a rich chimney in the ledge. The vein where richest is a soft clay ahout eight inches wide.

The Smuggler mine was located in Ballarat district in April, 1875, and commenced producing in the latter part of the same year. The country rock is gneiss, very nearly approaching mica schist in structure. In 1877 60 men were employed, of whom 13 were ore sorters. The mineral contained in the sorted ore consisted of sylvanite and eome arsenical and iron pyrites, and assayed ahout $400 per ton. The mine yielded during the month of April, 1877, 19 tons of second-class ore which sold for $7,000, and 50 tons of third class which sold for $2,000; in all, $9,000, at an outlay of $4,500.

*The Slide lode is located on the northern slope of Gold hill, in Gold Hill district. The vein lies hetween gneiss on one side and a dike of porphyry on the other. It ranges in width from four to ten feet, presenting all the indications of a heavy mineralized fissure vein. The ore shows a tendency to cling to the footwall which is gneiss. Considerahle of the rich ore milled $2,627 per ton.

The Red Cloud and Cold Spring mines bave already been mentioned. †Within two years and a half after discovery, they produced $600,000 from ahout 400 tons of ore, which therefore averaged $1,500 per ton.

‡The American mine is in Sunshine district. It is located on a fissure vein in gneissic granite. The following tahle will show tbe assay value of specimens of telluride ores from the American mine, and exhibited at the Centennial exhihition in 1876. The specimens were of course picked, hut contained much gangue. They weighed from 5 to 150 pounds each. The assaye were made by Mr. J. Alden Smith:

No. of Specimen.	Description of Ore.	Gold (in oz.) per T.	Silver (in oz.) per T.	Value per T. (approximate.)
0	Surfacc ore	3,170	140	$63,531
1	Sylvanite with gangue	1,500	160	30,178
2	Mixed	050	100	13,115
3	Auriferous Hessite	475	6,835	17,360
4	Mixed	379	5,461	13,800
7	Sylvanite	2,373	792	48,370
8	Mixed	300	110	6,126
9	Mixed	1,200	180	34,217
9	Mixed	250	95	5,109
11	Mixed	1,000	280	20,308
17	Sylvanite and gangue	2,050	240	41,276
18	Sylvanite and petzite with gangue	2,486	1,170	51,055
10	Surface ore	000	888	13,560
20	Surface ore	3,760	202	76,432
21	Surface ore	812	5,228	22,252
22	Auriferous Hessite	800	6,081	24,020
23	Petzite and sylvanite	2,908	1,732	60,120
24	Tellur-pyrites	2,373	792	48,331

Five tons of ore from this mine sold in Omaha (in hulk) for $5,050 per ton, coin. [To sell at this figure it must have assayed ahout $6,000 per ton.]

As less has heen written ahout tbe California mines where the ore consists of gold-hearing tellurides, and as many differencee exist between them and the Colorado mines, I give an extended description of two of the mines, the most important.

The Stanislaus mine, in Calaveras county, is the most developed of the California telluride mines, as well as the most important on account of its past yield. As it has heen carefully examincd several times, I give quite full and accurate data: §Dip, 75° east; width of vein, six feet (average); walls: east, regular; west, irregular and composed of numerous quartz feeders, which follow the stratificatiou and contain carhonates and tellurides. Vein matter: white quartz with sylvanite as an ore; also tellurides of silver, lead and nickel; feldspar, carbonates of calcium and of iron; pyrite. [I have examined numerous hand specimens of the ores from this mine, but in no instance have I observed any sylvanite or graphic tellurium. Petzite is the most ahnndant telluride mineral. Calaverite is prohahly meant by Mr. Bowman when he refere to eylvanite. The former is comparatively quite ahundant.] Form of pay deposit: Iu chimneys dipping south and in the seams and feeders of the west wall. (In the majority of casce in mines on the Mother lode, the pay chimneys dip north.) Free gold. Geological characteristics; the tellurides are found only in the quartz which contains crystals of feldspar, calcite and siderite. Pyrite occurs hoth in the compact quartz in the lode and in the adjacent slates, hut differing in appearance. That in the quartz occure in compact masses seldom crystallizing distinctly, with only cleavage; bright and strongly yellowish. That in the slate occurs in ieolated well-defined crystals; they contain very little gold [Coignet].

For some time after the tellurides were discovered in tbe ore, attempts were made to work the mine at a profit, hut were uneuccessful. The mine lay idle and full of water for 13 years. An attempt is now heing made to work it again. The mine has yielded, and etill yields, a high grade of ore. A considerable portion of the talcose elate wall will pay well to mill; it contains much free gold, and, it is said, some tellurets. A sample of the vein ore weighing 2.885 T, gave $3,555.94 hy chemical treatment.

The Rawhide mine, Tuolumne county, presents some points of difference from any I have thus far mentioned. It ie on the mother lode. Walls: east, elate; west, eerpentine with asbestus. Vein matter: quartz, colored green hy malachite; argentiferous gray copper (polytelite) containing tellurium and telluridea. It resembles in the character of its ore the Tellurium mine of Amador county, more than it does the mines ahout Carson Hill.

It is not prohable that the mines of Boulder county, Colorado, will again give the enormous returns ohtained on first opening them. In the majority the ore seems to diminish in both quantity and quality as we go down on the vein. In California the prospects are much brigbter; the group of mines on Careon Hill, whioh gave euch a wonderful yield many years ago, are now being reopened and worked hy improved methods. As regards permanence in depth, they seem to resemble the Transylvania mines more than they do the Colorado. The Morgan mine, which returned $2,000,000 from the croppings with the most primitive machines, the Stanislaus, the Melones and others, are not yet worked out by any means, only the eurface heing scratched. Other localities will, in all prohahility, soon commence to produce bullion. At the present time, it is not so much the lack of ore as the need of a more perfect and cheaper process for treatment, which retards the development of the mines.

IV.—Beneficiation.

The metallurgy of the telluride ores is in a comparatively unsatisfactory state, and I am safe in assuming at the outset of this discussion that no perfect process for treating these ores alone, so as to ohtain economically the fnll or nearly the full percentage of metal present, has heen found. There are, it is true, two or three smelting processes hy which small quantities of high-grade ore may he treated together with large quantities of other (hase metal, or rather hasic) ores; in this way some of the peculiar difficulties of their reduction are ohviated; even here, though, there is some loss due to the presence of tellurium. These methods which answer very well for first-class ore—constituting only about 10% of the total amount of rock raised—do not succeed so well with second-class ores. [The gangue of these ores heing exceedingly eilicious only a limited amount of the telluride ore can he put in a furnace mixture even though the other components are very hasic; the same percentage of either first or second class rock could he used, hut it would evidently require to produce the same amount of metal from the latter, as from the former, a much greater quantity of other ores, and a mnch longer period of time. The same amount of metal is therefore exposed to the action of several times as much slag and has several times as much time to fume away. The additional nercentage of loss is somewhat counterbalanced hy the correspondingly larger amount of hase metal or matte to take up the gold and silver, but not entirely. There must therefore necessarily he a greater percentage of loss in working second-class rock than is the case with first class.] As to third-class ore (unconcentrated), it may he said that it is utterly valueless for smelting purposes. Again, smelting works must he located convenient to the metalliferous deposits on which they depend for the greater portion of thcir ore supply, gcnerally in Colorado, auriferous and argentiferous lead and copper ores, or near wbere the necessary fuel is ohtained. The supply of telluride ores is too limited and insignificant from a smelting point of view, as well as variable, to pay to put up smelting works on the plan now under consideration. As no great quantity of good smelting ores, excepting perhaps auriferous iron pyrites (containiug usually a small percentage of copper pyrites) are found in or easily accessihle to the tellurium districts, more or less expensive transportation is necessary, which only high-grade ore will stand. It would of course be absurd to transport the poorest and hulkiest of the ores for euch a furnace except under peculiar and unusual circumstances. On the whole, therefore, this description of smelting cannot be considered the solution of the problem—how to work telluride ores?

Many yeare ago when the mines of Transylvania were yielding considerable quantities of rich tellurets, these ores were smelted in emall crucihles. This (at that time) was considered to give good results, its inapplicability in a general way to American conditions is so evident that I will not consider it in this paper.

For the purpose of showing at a glance the general character of all of the methods of working employed in the heneficiation of telluride ores, I have constructed a tabular synopsis. On it I shall hase the order of the detailed discussion of the different modes of reduction.

Table Showing Different Classes of Processes used for Working Telluride Ores and their Relations.

Raw Ore from the Mine				
Coarse Dry.	Crushing Plant.	Sorting Tables.		
Fine Dry.				
Smelting Furnaces.	Base Bullion. Iron Matte. Copper Matte.	Refinery. Various Wet Processes. Pearce's Process.		
Amalgamation Apparatus	Amalgam. Concentrators. Tailings.	Amalgam. 2d Class. Tailings.	Retort—Parting.	
Roasting Furnaces.	Amalgamation Apparatus. Tailings.	Amalgam. Tailings.	Chlorination Plant.	Concentrators. Tailings.
1st Class.	Crushing Plant.	Smelting Furnace. Cupellation Lead Bath.	Melting Pot.	
2d Class.	Crushing Plant.	Smelting Furnace. Crucible Smelting.	Roasting Furnace.	Chemical Processes.
3d Class.	Crushing Plant. Concentrators.	Tailings.	2d Class.	Tailings.

The procesees may be divided into two groups, according as tellurium ie present or not. The first, where tellurium is etill present or in the act of heing driven off, I call Primary. The other group, coneieting of thoee for treating the ore or ite producte after the tellurium is driven off, not being in any way peculiar or characteristic, I call Secondary. The detailed description will consider the first group, only referring to the eecond incidentally.

The essential point in treating theso ores ie the complete separation of the tellurium from its compounde, and the dieposing of it in euch a way as not to affect any suhsequent process for getting the metal out. As for the tellurium it may he said that it is absolutely worthless. Unlike arsenic and antimony it cannot be sold for chemical and other purposes; unlike sulphur, which can he converted into eulphuric acid if deeired, and used in the works, thue repaying in part the expense of the treatment necessitated hy its presence in the ore, it forms no compound of this kind (so far as yet known) which is of the elightest utility.

Raw Ore.

The raw ore as it comes from the mine is sent directly either to the crushing plant, or to the sorting tables to he first put through a dressing process.

1. The former, as the usual mode of treating gold ores, was used considerably at first, and ie still in use where a mine yields a very uniform grade of ore, or where all qualities are treated alike, the common process being assumed to give equally good and economical results for any grade or mixture of grades of ore. Generally speaking, I do not think it to he advisahle.

(*a.*) If the ore as it comes from the mine consists of practically only two grades (2d and 3d usually), and the line of treatment employed permits of wet crushing, it can be stamped wet, run through concentrators (mechanical) and there separated into second class ore and residues or tailings.

[NOTE.—In the tabular synopsis I have not indicated lines of treatment of this (*a*) character; they are not general and are comparatively very unimportant. Also I have not, except in one or two instances, made any reference to the presence or disposition of residues.]

2. A preliminary dressing on sorting tables is usually the first manipulation thc ore is suhjected to, and, owing to the nature of the ore and the special metallurgy employed, it is prohably the hest mode of procedure. On these tables the ore is hroken up with hammere and graded as follows:

1st Class—Value per ton upward of $1,000 or thereabout.

2d Class—Value per ton ahout $400.

3d Class—Value per tou, say from $15 to $75.

Residues—Barren rock of no value.

The proportion of each class of ore is variahle. If the ore is to he transported any considerahle distance to market, this preliminary hand sorting or concentration of some kind is indispensahle, and its cost will he more than repaid in lessened freight charges and a higher percentage of return.

It may not be inappropriate here to give a comparisou hetween wet and dry stamping, as far as it relates to telluride ores.

First, as regards wet stamping: The telluride minerals (more especially the gold and silver hearing) are pulverizcd [*i. e.*, converted into an amorphous powder] only with cousiderahle difficulty. They split up into fine light ecales, which float off in water over almost every contrivance which is used to catch them. Hence more or less loss of mineral will inevitably eneue. The ore must be dried and ground under a hurr wheel or some other machine, to break up lumps and the comparatively large uncrushed particles before furnace processes can be applied. With dry stamping the lose of mineral is reduced to a minimum and the ore ie ready at once for further treatment. The expense account is considerahly greater for dry than for wet etamping. The general practice seems to be to stamp dry, first and second-class ores; third-class are stamped wet and concentrated. In general, when it is intended to roast the ore the crushing is dry.

Smelting.

Telluride ores, ae has heen before etated, cannot he smelted alone, and on the character of the auxiliary material used does the nature and result of the epecial metallurgy employed depend. Before taking up epecial lines of treatment, some of the couditions common in a greater or lese degree to all of them, will he considered. These I ehall outline only in the most general way.

So small ie the percentage of metal even in rich oree, that the percentage of hase metal in the auxiliary material must he high in order to give a proper proportion of slag for the furnace mixture. The gangue is very silicious and must have some basic flux added to it, either as the gangue of the hase metal components or otherwise as fluxes. The slag must be very fusihle and fluid, either a einguello- or euhеilicate, the former usually, in order that it will not contain mucb mechanically enclosed metal; if too hasic it would injure the walls of the furnace. [It might he possihle to use a sesquisilicate, hut I know of no instance where it is done, the reason prohahly heing that it is too acid and would attack the reduced metal or matte]. If the slag becomes rich in metal it must he reworked. As a general rule it is best to have at least twenty (20) times as much hase metal as fine in the mixture of ores. Tellurium is very volatile, and gold and silver in its presence are also more or lees volatile; to reduce this loss to a minimum the emelting ehould be so carried on as to bring particles of reduced hase metal or matte in contact with unreduced particlee of the telluridea. A consideration of theee points will readily ehow that it ie not advisahle to nee more than a comparatively emall proportion of telluride ore, nor ie the reverse ever neceseary. The eupply of such ore is very

*Transactions of the American Institute of Mining Engineers, Vol. I., p. 315.

**Engineering and Mining Journal*, Vol. XXIV., p. 290.

†"Raymond's Report," 1875, Boulder county, Col.

‡Private communication from Mr. J. Alden Smith, State Geologist of Colorado.

§Bowman in "Raymond's Report," 1875.

limited, of base metal ores very abundant usually, and if this be not the case in some yet undiscovered district, there are some smelting methods that do not require a continuous supply of the latter, a small quantity being used over and over again.

Losses of gold and silver by smelting occur in two ways, by slagging and by volatilization with tellurium, both of which depend greatly on the manipulation. The former has already been mentioned. The latter is not very great, in some instances imperceptible. The loss of gold seems slightly greater proportionately than the loss of silver, judging by a comparison between the assay and analysis of the same specimens. The entire loss in both ways cannot amount to much or these processes would not be so generally used to the almost entire exclusion of others in Colorado, where many modes of reduction have been tried.

[To be Continued.]

The Engineer.

The New Eddystone Lighthouse.—The tower of the famous Eddystone lighthouse is now in a fair state of efficiency, but the gneiss rock on which it stands has been seriously shaken by the incessant sea strokes on the tower, and the rock is considerably undermined at its base. It has, therefore, been determined to erect a new tower on a spot which affords a good foundation near low water level, at about 127 feet distant from the present site. The focal plane of the present lighthouse is at an elevation of 72 feet above high water; that of the new building will be 130 feet. The actual useful range of the light, which is now about 14 nautical miles, will thus be extended to 17½ miles. The new tower will be constructed entirely of granite. The hight will be 138 feet above the rock to the top of the cornice, and the diameter of the tower under the cornice will be 18 feet 6 inches. The tower will be solid (with the exception of containing a water tank) to the hight of 25 feet 6 inches above high water springs. At this level will commence the side walls with a thickness of 8 feet 6 inches, diminishing to 2 feet 3 inches at the top. The tower will contain nine apartments, each 10 feet in hight, in addition to the lantern, the seven uppermost being 14 feet in diameter. The estimated cost is £78,000.

A Dangerous Enterprise.—A great engineering work, now in course of execution is the lighthouse of Ar-nien, on a rock beyond the Isle of Sein, off Cape Finistorre, (Land's End), Brittany, western France. In 1860 a commission was appointed to inquire into the possibility of constructing a lighthouse at this point, where the currents were so tremendous that even in the calmest weather they cause a very heavy sea in certain directions of the wind. The rock is of hard gneiss, from 40 to 50 feet in length and about 25 in breadth. The preliminary work was done by fishermen of the Isle of Sein, whose familiarity with these waters enable them to reach the rock when no one else could. Their method was, when opportunity offered, for two of them, wearing cork belts, to get out of their boats and lie upon the rock, which they clutched with one hand, while they made holes at intervals of three feet with the other. Meanwhile they were covered with spray, and sometimes carried away to be recovered by a boat. In 1867 only eight hours' work could be accomplished, and 15 holes made; the next year 40 holes were made. In 1869 the building was begun, and now the tower is 40 feet above the highest tides, but it is intended to be about 90 feet.—*Manufacturer and Builder.*

The Speed of Screw Steamers.—It is generally supposed that the builders of steam vessels have so mastered the principles of their art that they can predict to a nicety what speed a given vessel will have when driven by an engine of a certain horse-power. A recent instance in England shows that this is far from being true. A twin screw vessel in the British navy, the *Iris*, was built for great speed. Mr. Froude, who is considered the best authority in the world, predicted that it could be driven at 17.5 knots per hour with 7,000-horse-power. His calculations were checked by the admiralty and found correct. At the trial her engines indicated 7,503-horse-power, but the speed was only 16.577 knots. The screws were then changed, and the speed attained was 18.573 knots, or more than a knot faster than was expected. Here were two distinct errors. The *Engineer* concludes from these trials that very little is known accurately concerning the action of screw propellers, even by such men as Mr. Froude and Mr. Barnaby, chief naval constructor of the admiralty.

Rendering Arches and Tunnels Waterproof.—A composition formed by the admixture of about equal parts of coal-tar pitch, Archangel pitch, Stockholm tar, cotton seed oil, anthracine oil, and resin is proposed by Mr. Hamor Lockword, of Manchester, for rendering arches, tunnels, etc., impervious to water. The composition being well mixed and heated, a coating of the same about one-half inch thick is first laid on the top of the arch or bridge, and then a light coating of varnish applied hot, followed by a layer of brattice cloth, then another coat of varnish, and next a layer of roofing felt, and a third coat of varnish, after which he applies a second coat of brattice cloth, and finishes off with a one-half inch coating of the first-named mixture or composition.

Useful Information.

Spontaneous Combustion of Coal on Vessels.

The falling off in the demand for English coal has had one salutary result, and that is, it has seemingly put a stop to the destruction by spontaneous combustion of coal vessels. Four or five years ago the number of large ships annually destroyed in this way was alarmingly great. In 1873, there were 23 ships, out of those which sailed from Great Britain laden with coal, which were lost by the spontaneous breaking out of fire in their cargoes. In 1874, the number of cases of fire was increased to 50; and it is now thought that if the domestic demand for coal had not then begun to fall off, the loss of vessel property in the succeeding years would have been even more serious. As it was, this period of destruction ended almost as quickly as it began. In 1875, the number of losses was relatively small; and for a year or two past, although vast quantities of coal are annually shipped from Cardiff and Newcastle to South America and the East Indies, we believe there has not been a single case reported of spontaneous combustion in a vessel's cargo. This sudden change goes far to substantiate the theory put forward, four years ago, by Mr. R. Cooper Rundell, an English scientist. It had been claimed that these fires were due to imperfect systems of ventilation, and also to the fact that the coal had been wet with rain before it was put into the ship's hold. The trouble with this line of argument, as Mr. Rundell pointed out, was that it did not explain the reason for the previous non-occurrence of fires. The methods of ventilation and the average of rainfall remained tolerably uniform; but in one year two coal ships were destroyed, and in another 50 cargoes took fire. The cause, therefore, would seem to lie outside of these two conditions, and Mr. Rundell traced it to the very large quantity of small coal which at that time, in the excessive pressure of business, was taken from the mines and hurried in a damp state on board of the vessels. The article was then in so much demand that it was useless to object to the inferior quality of the coal furnished, or to expect that before being delivered it would be dried by exposure to the sun. The shippers had to take what they could get, and as a consequence of this indiscriminate loading, millions of dollars worth of shipping property was destroyed. At present the coal purchased for shipment is taken from large heaps that have been exposed to the drying action of the atmosphere and has been carefully screened, so as to exclude the finer particles which the high prices of five years ago allowed the miner to dispose of as merchantable.—*Iron Age.*

Electrical Manifestations at Vale Colliery.

Recently discovered developments of electricity in the large boilers in connection with the coal-raising apparatus of the Vale Company's works are thus recorded in the Halifax *Herald:*

On placing the hand or any part of the body near the boiler door or safety valve, it received a severe shock from the same, and sparks might be distinctly seen passing from the boiler, etc., to the part of the body nearest to it.

On further experimenting with the same, it was found that it was necessary to be in close proximity to the boiler to receive the electric shock, but when standing in the current of steam escaping from the safety valve, severer shocks were experienced, and vivid lights beheld between the party standing in the current of steam and others standing in close proximity. Also, a party standing in the steam, holding a piece of steel, iron, or any other conductor of electricity perceived that various steady currents of electricity were produced. It was further noticed that when any person held his hand in the steam, the electric sparks were clearly seen passing from the finger ends of the other hand; or when a person placed himself in the steam, it was noticed that he became so charged with electricity that it might be clearly seen from every hair-end on his head, and on coming out from the steam, he would communicate a shock to any party whom he might touch.

It may be further stated that in placing any conductor in the steam the electric current was seen as vividly as in the other cases. Since the above was discovered at the Vale, something of the same nature was produced at the Albion mines.

It is the opinion that the electric current is generated from the steam under friction, as the spark is seen at any point where there is a leak; but whether it is caused by the mineral water from the mine, or at the expense of the boilers themselves, is not known.

Another Narcotic Plant.—Major Stuart, writing from Port au Prince, notices a plant growing there of such strong narcotic power that, in the hands of a skillful practitioner it will produce coma of any intensity or duration, or even death itself when so intended. The knowledge of this plant, he says, is confined to a few families, who transmit the secret as an heirloom from generation to generation, and the heritage is highly valued, confirming, it is thought the power of miracle-workers and priests—for the plant is in many ways used in aid of solemn imposture, superstition and crime. The power thus exercised is called "wanga," a word that inspires the African with awe and dread. The wanga priest can throw into a death like coma, and knowing the moment of consciousness returning, he will make a show of recalling to life, or, if a burglary is to be committed, he can, by means of his art, cast a deep sleep on his victims. Major Stuart thinks that this plant would prove a valuable acquisition to medical science.

A Native Alloy of Copper and Zinc.—A correspondent of the *Mining Record* gives the following data on a native alloy of copper and zinc sent by S. H. Hill of Downieville, Cal.: The specimens examined were in the form of small, somewhat flattened, concretionary masses, from three-quarters to one-quarter centimeters in diameter, and without apparent crystalline structure. Color from dark reddish brown to yellowish white, streak faint yellowish white slightly incrusted with green carbonate of copper; somewhat brittle, specific gravity of one specimen, 8.33. An analysis of this sample by Dr. T. B. Stillman gave: copper, 85.02%; zinc, 11.02%; antimony, 2.82 %; iron, .09%; total, 99.95%. These specimens were found, according to Mr. Hill, in the ravines along the south fork of the North Yuba river, in Sierra county, California. These ravines have for years been worked for gold, which is still found in paying quantities, associated with silver, native copper, zincblende and galena.

Why Glass is Broken by Hot Water.—No person could be so foolish as to hazard the breaking of a glass by pouring hot water upon it, if he understood the simple means of accounting for the breakage. If hot water is poured into a glass with a round bottom, the expension produced by the heat of the water will cause the bottom of the glass to enlarge, while the sides, which are not heated, retain their former dimensions, and, consequently, if the heat be sufficiently intense, the bottom will be forced from the sides, and a crack or flaw will surround that part of the glass by which the sides are united to the bottom. If, however, the glass is wetted with a little warm water, so that the whole is gradually heated and thereby expanded, boiling water can then be poured in without damage. If a silver spoon is placed in a goblet or glass jar, boiling water can then be poured in without danger, unless the article has been taken from a frosty closet and is very cold.

Good Health.

How to Bathe.

Editors Press:—"The summer now is here;" pleasure seekers and holiday makers are "come, come, coming" to the cool, quiet seaside. Many, I notice, are ignorant of the first principles of bathing, although anxious to derive benefit from a "dip in the briny." Let me, for the profit of such, give a few bathing axioms.

Don't bathe at all if you feel chilly. Don't loiter, semi-nude, at the margin of the sand, letting "I dare not wait upon I would." Once undressed, rush into the water; or, better still, if practicable, dive in head first.

If you can't dive in, wet your head as soon as possible, either by splashing water over it or dipping under the surface. Ladies afraid of wetting their hair had better refrain from bathing, as dry-head bathing is neither pleasant nor beneficial, and induces headache and other unpleasant results.

Let your first bath be just a dip in and out again. Make each succeeding bath a little longer until a maximum of 15 minutes is reached. Keep in motion all the time you are in the water, either swimming or splashing about.

To have a really enjoyable bath, find a retired spot and bathe in your skin; "costumes" are a nuisance. Have a big Turkish towel, one and a half yards long and a yard wide, and scour yourself till you're as red as a lobster. Dress quickly, and go punish the hash.

Edw. Berwick.

Monterey, Cal.

Trichinosis.

The above disease is caused by eating diseased pork, or pork affected by a small microscopic animal existing in the flesh of pork. Generally encysted in the pork, the human stomach sets the animalcule free, which speedily reproduces myriads of its species, and penetrating into the blood is carried by the capillaries into every part of the body. It has been said that there is no remedy for this dreadful disease, which causes intense agony in the subject, and death in a short time. Careful experiments show that when pork is thoroughly cooked, every part being exposed to the temperature of 212°, or boiling heat, the trichinæ are destroyed and the meat may be eaten with impunity. Care should be exercised in the eating of raw smoked pork, such as ham, bacon or Bologna sausage, as there is no means of determining whether the pork is diseased or not, from its general appearance, and several days elapse after the pork is taken into the human stomach before the effects are perceived. Good clean-fed hogs are generally free from trichinæ, while unclean, promiscuous feeders, especially carniverous hogs, are apt to be affected. Rabbits and rats are also sometimes affected. Man alone suffers death from the disease. The animals affected by it do not show any symptoms. The microscope is the only means of detecting the condition of the pork.

The following remedy is given in the *American Medical Bi-Weekly:* Dr. Rhode, in the *Berlin Klin. Wochenschrift*, states that he accidentally discovered that the free administration of ergot, especially of ergotin hypodermically, is a speedy and positive curative agent in trichinosis. In one case eight grammes of ergotin effected a speedy cure.

Color Blindness.

At the annual meeting of the Pennsylvania State Medical Society recently, Dr. P. D. Keyser, of the Wills hospital, Philadelphia, reported that he had examined as to color blindness a large number of trainmen on different roads. He found that of those examined 3½% mistook colors one for the other, their defects being of such character as to make them really incapable of filling their positions with safety. There were 8½% additional who, although able to distinguish colors, were unable to tell the various shades, thus making 12% of those examined who were not able to distinguish shades and colors quickly and sharply. Another physician, as the result of extended examination, points out dangers the traveling public undergo through the prevalence of color blindness. Dr. Jefferies, of Boston, has examined the eyes of 24,000 persons. He finds the proportion of those who are unfit to perform railroad or steamboat service to be about the same as was discovered by Dr. Keyser—3½%. That is more than 3 out of every 100 of engineers, conductors and brakemen who control our swift-flying trains cannot distinguish the red light from the green! There is reason in Dr. Jefferies' suggestion that every railroad employee be compelled to submit to au examination as to his ability to discriminate colors before he is allowed to take his post.

A Remedy.

La France Medicale states that M. Delbœuf has found that if a person afflicted with Daltonism looks through a layer of fuchsine in solution, his infirmity disappears. A practical application of this discovery has been made by M. Joval, by interposing between two glasses a thin layer of gelatine previously tinted with fuchsine. By regarding objects through such a medium all the difficulties of color blindness are said to be corrected.—*Chemical Review.*

Respiration Affected by Food.—A very careful examination by Dr. Speck, of the changes produced in the respiratory process by the use of fatty food, of coffee, quinine, alcohol and water, and by the inspiration of air respectively rich in carbonic acid, poor in oxygen and rich in oxygen, has led him to the following conclusions: With an increased proportion of hydrogen in diet, the amount of air inspired and expired decreases, and nutriments, such as sugar, which contain little hydrogen in comparison with their oxygen, involve more exertion of the respiratory organs than such as are rich in hydrogen, like the fats; the more carbon predominates in the food, in proportion to hydrogen, the more air is exhaled in proportion to that inhaled, the more carbon increases in the diet in proportion to hydrogen, the more carbonic acid is evolved and the more oxygen is taken up—while the richer the diet in hydrogen the less oxygen is required. An atmosphere containing 5% or 6% of carbonic acid could be breathed for some minutes without oppression; at 11.51% great exertion was needed to breathe for one minute; at 7.2 all the carbonic acid produced in the body is retained in the blood.

Poisoning by Mushrooms.—J. A. Palmer states that there are three different ways in which mushrooms may act as a poison. First, they may produce theeffects of indigestible matter, as when the hard coriaceous species is eaten; and even the edible mushroom may cause a similar result, for when it is decomposing it gives off sulphureted hydrogen gas in quantity sufficient to cause vomiting. Second, mushrooms may be gelatinous or acrid. Third, a subtle alkaloid, without smell or taste, is contained in some mushrooms, as, for instance, in the group of the Amanitæ, and is called amanitin. No antidote has yet been discovered for this poison, and to it most of the cases of death following the eating of mushrooms is due. It is at first slow in its action, but after the lapse of eight to fifteen hours the patient experiences stupefaction, nausea and diarrhea. Delirium follows, and then death. Mushrooms containing amaaitin will impart poisonous properties to wholesome varieties if both happen to be placed in the same vessel. The poison can be absorbed by the pores of the skin. Mr. Palmer carried in his hand amanitæ wrapped up in paper, and notwithstanding the protection which the paper should have afforded, he was seized with alarming symptoms

Cooked Food.—There is probably less observance of the laws of health in the cooking of food than in anything else. In order that food should properly assimilate with the blood and nourish the system, meat should be cooked so as to preserve all of the animal juices, and vegetables never over-cooked. Over-cooked meat is no more nourishing than woody fiber; while over-cooked vegetables are putrefactive.

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W. B. EWER.....SENIOR EDITOR.

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The Week.

The mining interests of the coast do not show any deterioration, the imagination building up a glittering delusive future upon speculative interests, and paper wealth, overlooks the practical character of our mines. Rich strikes and discoveries taken with a grain of salt, indicate favorable prospects, while the diminution in bullion and assessments levied, show that capital is absolutely necessary to develop fully our mineral wealth. The over-crowded condition of new mining regions, the low wages and high living attending a rush, should be a warning to practice moderation. There is room for capital and we could safely quadruple the output of gold and silver without disturbing the world's demand. The falling off this year from last is estimated at 20% to 30%. The world can use an annual product of $300,000,000 now, while the total product is $160,000,000 short of the demand. Our mines could help to fill this gap, if the mining business were confined to the legitimate as distinguished from the purely speculative.

Coal Gas and Electric Lights.—M. Hippolyte Fontaine, an accomplished electrician and the director and proprietor of the *Revue Industrielle*, has just published a second edition of his "Electric Lights." In his preface, M. Fontaine does not hesitate to declare that coal gas has nothing to fear from electricity as an illuminator, despite the competition likely to ensue between these two systems of illumination, whether public or private, and adds: "The manufacture of coal gas will never be interfered with by electricity. Electricity will never replace gas, lamps, or even candles. It does not and cannot create a revolution in means of illumination, or destroy what exists or monopolize all of the industrial, public and private applications of light. The electric light has its own particular place in the midst of a crowd of indispensable utilities, but far from diminishing the consumption of other means of illumination, it will cause their more perfect development by increasing the demand for a perfect illumination in quantity as well as in quality.

Crooked Ways in Mining.

Mining companies when organizing have the bad habit of fixing their capital stock at figures grossly disproportionate to the value of the properties ostensibly represented by such stock. This is a practice that for various reasons calls for abatement. In the first place it is dishonest. It is a false pretence. These companies are not the owners of any such values as this system of over-capitalization implies. Nor are these big figures a mere harmless fiction, as many suppose. If not intended for dishonest purposes they are used to that end. In practice they become implements of deception and fraud. To illustrate, a party owning a mining claim organizes a company, incorporates the same with, say a nominal capital stock of a million dollars, divided into a hundred thousand shares of the par value of ten dollars each, which shares are issued to the several members of the company. Such procedure, including necessary books, etc., costs but a trifle. This mining claim may be but little developed, may, in fact be wholly worthless, and yet it will be possible for the holders of these shares to work off a great many of them on the public. We say it will be possible because there is a large class of men who for the past 20 years have depended for a subsistence mainly upon this sort of traffic. With their pockets filled with this rubbish they have managed to work their way comfortably through the world, effecting purchases and paying their debts with it wherever they could strike a simple tradesman or a helpless creditor. Half the men one sees around the purlieus of the stock house eke out a precarious livelihood through the aid of these mining shares. They pay for their washing, lodging and their other small bills with them, and, in short, shove them off wherever they can, though morally it is no better than paying with counterfeit bills or bogus coin. This is one of the small ways in which this over-capitalizing of mining stocks becomes damaging and reprehensible.

But this style of inflation if persevered in must eventually work serious harm to our mining interests abroad, as no thoughtful business man will invest his money in securities so devoid of solid backing. What sense is there in placing a valuation upon a property ten times greater than any capitalist would ever think of paying for it? A better plan would be to commence with a capital stock that fairly represents the worth of the mine, and then increasing it as the latter appreciated in value, should it ever do so. But this method has, in some instances at least, actually been reversed; companies increasing their capital as their mines became impoverished. The ores in the Bonanza mines began to show signs of depletion at the time the management more than quadrupled their shares. The nominal capital of the various companies owning mines on the main Comstock range, to say nothing of lateral claims, aggregates over $500,000,000, yet where could a syndicate be raised that would pay for these properties, 20% of this appraisement? We are sorry to see that this practice, so long prevalent on the Comstock, is finding repetition in Bodie, Utah and Colorado, where a number of mining companies have lately been organized with capitals ranging from ten to twenty million dollars, and this, though their mines have in some instances, been but little opened and afford as yet, no evidence of large value.

Akin to this plan of over stocking mines at the start or watering their shares afterwards, is that of consolidating various interests, or rather the pretence of effecting some sort of consolidation and under color thereof increasing the capital of the company, though they have in no wise increased their property in extent or value. This thing has been largely practiced in the Bodie district of late, where several of the leading companies have been doubling up their capital stock and number of shares, and taking on a prefix indicative of a concentration of interests or an aggregation of properties where none has actually taken place.

What we have to complain of in these cases is the bad faith they imply, and which in almost any other business would be looked upon as a taint of fraud. It is this loading down mining with so many crooked practices that has given rise to the question whether or not it is a legitimate business. As Prof. Clayton has so aptly remarked, mining for the precious metals is a legitimate business to those who make it so; but what calling could hope to escape these imputations by innuendo were it oppressed with so many dead weights, and so beset with leeches on every side? It is no justification of these abuses to say they are practiced in other pursuits as well as in this; nor is it true that they so generally prevail in other branches of business. Railroad incorporations do not over-capitalize like mining companies at the start, and if they afterwards water their stocks it is not done when their earnings are likely to suffer decline or be extinguished altogether. If these or other industrial institutions consolidate the act is apt to be attended by some increment of property, muniments or other forms of wealth, their operations and effects being always open to inspection, and not like those of mining companies deeply buried up or susceptible of easy concealment from the world.

The professional gambler does not pursue his calling on the public thoroughfares, nor is he permitted to open an office in the respectable and much frequented portions of the town. Those who wish to play must seek him out and themselves inaugurate the game. He does not invade the domestic circles and urge the inmates, even the mother and servant girl, to stake their money on the turn of a card. He does not stand at the street corners, and with deception and lies try to shove off a lot of worthless mining shares on a confiding acquaintance, nor seek to pay his room rent and board bill with this sort of rubbish—in all of which he differs from the ordinary stock sharp and dealer in wild cat mining scrip, who with an equal dislike of honest work, lacks, still, the honorable instincts of the professional gambler.

We believe mining to be a useful industry. We know it can stand on its own merits. The practices on which we have been animadverting are foreign to the business. They are prejudicial and hurtful to it. They have brought it into bad repute, and we feel constrained to protest against their further continuance. Any calling that requires auxiliaries of this kind had better perish.

Statements about California Mining.

In the New York *Sun* of recent date appears a letter on the mines of this coast from the pen of Alexander Del Mar, a writer on statistical, economic and monetary topics, and for some years past a resident of San Francisco. This letter, because of certain strictures upon the condition, prospects and management of our mines contained therein, has been widely commented upon by the newspapers of California, some of which have heartily commended while others have so earnestly condemned the same; these two sections of the press here, as is too apt to be the case with the press everywhere, having been governed each by the special interest it claims to represent. While we detect in Mr. Del Mar's letter various misstatements of facts, as well as what we believe to be some errors of opinion, it seems to contain at the same time some well presented truths coupled with a deal of wholesome advice, which the parties to whom it is particularly addressed would do well to heed.

We think this gentleman is mistaken in saying that mining for the precious metals can no longer be profitably carried on with free labor, for the reason that gold and silver of modern production cannot compete with the large stock of these metals already on hand, being the product of the much cheaper labor of former times. Overlooking the fact that this competition is altogether fanciful, the answer to the above objection is, that the advantages gained through the employment of improved motors and machinery for prosecuting the business of mining more than compensate for the cheaper labor of ancient times. Fourteen thousand mules and twice as many peons were formerly maintained in a single mining district in Mexico to perform a service that could be better accomplished by half a dozen of the more powerful steam engines now in use on the Comstock lode.

The statement in this letter to the *Sun* that the hydraulic miners of California think it worth while to wash a cubic yard of gravel for the one cent's worth of gold it contains must, of course, be accepted in a comparative sense, and, as merely expressing the writer's idea of the unprofitable character of this business, inasmuch as the value of the gold obtained from the hydraulic washings averages fully 20 cents to the cubic yard.

The cautions thrown out by Mr. Del Mar against investing in the shares of mines listed on the New York Boards are neither so foolish or untimely as some may suppose. Properties liable to fluctuate in their market values as some of our mining shares have done, must be very dangerous securities for the stranger to deal in. Take, for example, the history of half a dozen of the principal mines on the Comstock belt, tracing the same back no more than seven or eight years. In the fall of 1870 their aggregate value, as measured by current quotations, was scarcely $5,000,000. In January, 1875, this value had risen to $270,000,000, and in a little more than two years after had fallen again to $10,000,000. In another year it advanced again to $30,000,000, and within four months thereafter jumped up to $125,000,000, since which time it has again dwindled to an insignificant sum, only two of these mines having been able during the interim to show any considerable body of good ores, and both of these towards the last having undergone great deterioration. How can Mr. Del Mar, or any one else, too strongly deprecate investments in properties like these! It is sheer nonsense to affect to criticise the writer who characterizes this class of operations as the fraud that they are. Better thank him, as one caring for the welfare of the inexperienced, and laboring in the interest of legitimate mining.

In Mono County.—Mr. J. H. Wheeler is now on his way to Mono county to present the claims of the Press, and to secure trustworthy data for descriptive articles on the condition and prospects of mining in this famous district. We trust he may be aided in his work by all those whom he may approach.

The will of Baron de Rothschild disposes of personalty amounting to £2,700,000.

Nature of the Inner Earth.

The nature of the inner earth appeals to a circle of inquirers far outside the pale of the special sciences, whether the earth is a hollow shell containing molten matter, or compressed gas, or has a solid crust and nucleus separated by an intermediate layer of liquid, each has its advocates, and is supported by arguments of more or less weight. During a visit to Vesuvius last May, Herr Siemens, to explain the phenomena which he witnessed, was driven to the conclusion that hydrogen gas, or its combustible compounds, rise from below, and, mingling with atmospheric oxygen, form an explosive mixture which is burnt in the upper part of the volcanic chimney.

By continued cooling of the molten globe, a separation of its components would probably occur, according to their relative weights. The igneous liquid would not be homogeneous throughout. Those compounds which were specifically heavier would be attracted toward the interior of the viscous sphere, while the less dense substances might remain nearer to the outside; thus, the acid silicates might be separated from, and float upon the denser basic silicates.

Whether the solidification would commence at the outside or at the center of the refrigerating globe, is the point of argument. If a mass of molten metal be allowed to cool, a crust soon forms over the surface, while the interior may remain for some time in a liquid state, and, hence, it is natural to argue that we live upon the crust of a sphere which contains a mass of molten matter.

It is now 30 years since Prof. James Thomson announced the theory that if a body expand during solidification, its melting point must be lowered by pressure. A theory afterward confirmed experimentally by his brother, now Sir William Thomson, who showed that the melting point of ice was lowered in the way suggested; pointing out at the same time that if the substance contracted during solidification, its melting point ought to be raised—a prediction confirmed by the experiments of the late Mr. Hopkins, of Cambridge, whose investigation extended to such substances as wax and stearine, sulphur and spermaceti. It is clear, therefore, that in such a case, pressure and heat directly oppose each other; the former tending to prevent, and the latter tending to promote fusion. Supposing that the surface of the cooling globe were locally solidified, the solid portions might be again fused as they descended to regions of higher temperature, and the globe might thus be kept in a liquid condition until it became sufficiently viscous to prevent the subsidence of the solidified portions, when a solid crust would permanently form on the exterior, enclosing a fluid mass within. But if the solidified portions, as they sank in the molten mass, had their fusing point greatly raised by the increased pressure to which they were subjected, then it is possible that they might retain their solid condition, even at the very center of the globe, and thus the process of solidification would gradually tend outward, until a solid or nearly solid spheroid was ultimately produced.

All depends, however, upon the question whether the molten rock would contract on solidification, and, if so, to what extent. Bischof's experiment went to show that solid rocks are about 20% denser than in a molten state. Mr. Mallet's experiments on blast-furnace slags show, however, that these silicates contract only about 6% during solidification. Herr Siemens found that if glass be perfectly fused to a thin liquid and be then allowed to cool, it rapidly contracts until it acquires a plastic or viscous condition; but on further cooling the contraction is greatly diminished; until at the moment of solidification a slight expansion occurs, and hence Herr Siemens concludes that the experiments of Thomson and Bischof prove, not that the earth in consequence of pressure is solid to its center, but simply that the interior has become plastic or viscous, and upon no other hypothesis can the formation of the many thousand feet of alternating sedimentary deposits which are spread over the surface of the earth be accounted for. Upon the plastic hypothesis may be explained the great elevation of many continental areas, and the gradual upheavals and depressions of large tracts of country at the present day. The difference in height between the plateau of Central Asia and the bottom of the Pacific ocean is at least 12,000 meters, representing a difference of pressure on the viscous matter of about 1,000 atmospheres, whence the rocks which form the floor of the ocean, must, of course, be denser than the others in order to attain the requisite hydrostatic equilibrium. Archdeacon Pratt, remarking upon the attractive action of the Himalayas upon the plumb line, says: "The density of the crust beneath the mountains must be less than that below the plains, and still less than that below the ocean bed." The Astronomer Royal, in a popular lecture last year, at Cockermouth, expressed himself in similar terms: "If one might presume on such a point, I should say that the high parts of the earth are made of something light. The heavy dense parts are those covered by considerable quantities of water, and they have sunk deep in the center of lava, in which I conceive all things to be resting." And Sir George Airy adds the great weight of his authority to the view that the center of the earth is still fluid.

A Pacific Coast Harbor of Refuge.

The peculiar configuration of the Pacific coast lins of Lower California, California, Oregon and Washington Territory is such that there are very few indentations affording harbor facilities in the whole length. Between San Diego, at the southern boundary of California, and the Strait of Fuca in Washington, a distance of some 1,300 miles, there are really only two good harbors accessible at all times—San Diego and San Francisco. There are a few others which are good when ones inside, but they are bar harbors, difficult of access in stormy weather. A large proportion of the landing places are mere roadsteads partially protected from the summer winds by projecting headlands, but open to the southerly gales of the winter months. Between San Francisco and San Diego most of the trade is done by steamers, and to the more important points north of this place steamer connection is made. There is, however, a very large fleet of sailing vessels in the coasting trade, carrying produce, lumber and coal. The bulk of this trade is to the north of San Francisco, to the lumber and coal regions, our northern coast line being especially rich in its lumber resources. There are 945 vessels, aggregating 243,709 tons, belonging to the port of San Francisco, and of this number, 467 are schooners engaged in the coasting trade.

Most of the northern coast trade is done at "chute" landings, as they are called, a loading system necessary from the ruggedness of the coast line. These chutes consist of a long incline of wood in the form of a shallow trough, extending from a headland of a shipping point, or from a high wharf or pier, out to a point where the water is deep enough to allow vessels to come under and load. Lumber and other articles are slid down these chutes to the vessel's deck, the vessel meantime being moored head and stern and tied up strongly to keep her in position. Some of these chutes are 400 or 500 feet long. The peculiar formation of the coast brings nearly all the chutes on the north sides of the landings. At some places even these cannot be used, owing to the roughness of the place. Then a wire rope is let down from the cliff, taken between the schooner's masts to a rock or buoy, and a steam engine on shore lowers the material down the rope to the vessel.

A great many wrecks occur in winter on this coast from the lack of harbors, as in bad weather vessels have to be at sea and take it as it comes, with no place to run to. The roadsteads are untenable and the bar harbors inaccessible. A harbor of refuge has therefore become an absolute necessity, and steps have been taken by the Government to construct one. Congress has appropriated $150,000 for the commencement of the work, which will cost some $8,000,000 or $10,000,000 to complete. It will be the largest operation ever undertaken on this coast by either private corporations or the Government.

It has been decided to have this artificial harbor at some point on the coast north of San Francisco, between it and the Strait of Fuca, a distance of 700 miles; between which two points there is not a single place accessible at all times. The United States Board of Engineers, under instructions, examined Drake's bay, Mendocino City, Shelter cove, Humboldt bay, Trinidad harbor, Crescent City, Macks' arch, Port Orford, and Cape Gregory to see which place afforded the best facilities. After the examination they reported on the cost of all, giving preference to Trinidad harbor, an engraving of which we herewith present, showing the configuration of the harbor and the lines of a proposed breakwater, as designed by the board.

Trinidad bay is about 17 miles above Humboldt bay and 31 miles north of Cape Mendocino, on the right between that point and Pt. St. George, being about midway between San Francisco and the Columbia river, the two principal commercial and shipping ports on the Pacific coast. Cape Mendocino extends some 15 miles to the westward of it, so the harbor is in a curve of the coast line somewhat protected from winter storms by the formation of the land. In such bights or indentations on the coast the storms and seas are not so severe as they are at the capes and points lying further to the westward.

The approach to the harbor is uninterrupted, and there are no broken rocks or shoals. The headland is 380 feet high and 60 acres in extent. It already belongs to the Government, so no money will be required to buy the land. There is also a lighthouse there now. The headland is formed of hard metamorphic sandstone, furnishing material suitable for the construction of a wall. The first section of breakwater from the head outwards will cost, according to the estimates of the engineers, $3,076,000. The two sections, or whole breakwater, will cost $7,694,000. It will take over seven years to build the first section, and between 17 and 18 years to build the whole, on the supposition that 1,000 tons of stone per day can be put in position each working day in the year. This will give some idea of the magnitude of the proposed work.

Of course where so much money is to be spent there is considerable rivalry as to point of location. The engineers, desiring further information, invited all persons interested to come before them and explain the advantages of their respective localities. This conference has drawn out very many conflicting opinions from ship masters and others. It is probable, however, that the choice will be between Trinidad and Port Orford. The engineers, with the new facts before them, will next month make another and more searching examination, and report finally. The breakwater at Port Orford will cost $10,507,000, the depth of water increasing the cost. The engineers may see fit to change their opinions on further examination, but the final choice rests with them, they taking all questions of geographical position, natural facilities, cost, etc., into consideration.

TRINIDAD BAY, CALIFORNIA—SHOWING LINES OF PROPOSED BREAKWATER FOR HARBOR OF REFUGE.

"American Antiquarian."—We acknowledge receipt of the "American Antiquarian," published at Chicago, Ill., under the editorial charge of Rev. Stephen D. Peet, and in a future issue will refer more at length to its interesting contents.

Senator Blaine has written a letter to New York merchants on the decay of American commerce and the means of promoting its revival.

Sites of Especial Mining Activity.

In glancing over the mineral districts of California, mining affairs seem to be in a rather apathetic condition in all that part of the State lying south of Mono and Mariposa counties. Throughout that extensive region little has transpired of late in connection with the business of mining calling for special notice, either as regards new discoveries, progress made or openings presented for investment. In the Julian and Banner districts, San Diego county, at Silverado, in Los Angeles, and at a number of points in Inyo, Kern and Fresno counties work has been kept up with some show of activity, but elsewhere in this section of the State mining operations languish, having suffered contraction rather than expansion during the past two or three years.

Of all our quartz mining centers the Bodie district, in Mono county, presents just now the most animated as well as the most hopeful and prosperous locality, and there is scarcely a doubt but several of the mines here are really properties of very great value. On this point the affirmative testimony is strong and quite unanimous. Of the many experts and practical miners who have visited the district within the past month, none have expressed other than a high opinion of the ore bodies developed in the Standard and Bodie mines, some of these parties avowing the belief that the Standard find is second only in importance to the bonanza strike on the Comstock lode. I. M. Taylor, who has just returned from a visit to these mines, made in the interest of New York investors, tells us that he does not think the accounts given of them by either visitors or the local press have been at all exaggerated. He made careful measurements of the Standard exploitations and ore reserves, which latter he considers ample to keep the company's 20-stamp mill running steadily for the next three years, the profits in sight amounting to more than the entire property is selling for on the New York board, rating the stock at $36 per share. Aside from established reserves the ore bodies developed point to continuity in depth with a likelihood of others being opened in virgin ground. The ores are exclusively gold-bearing, and so free from contumacious elements that they surrender 90% of the precious metal they contain under the most cheap and simple treatment in use. They are sent to mill without assorting, and yield an average of $90 per ton, the results of downward exploration tending to a higher grade. That this district opens an inviting field for investment it is needless to say.

Coming north into Alpine county, still east of the Sierra, we find that the prospects of the few miners left here have undergone some improvement of late, the outlook in the Monitor district being very much better than ever before. Crossing the mountains several active camps on the main auriferous quartz belt arrest attention. First we have the group of mines belonging to the Boudsretta, the Martin & Walling, and the Boudurant Gold Mining and Reduction Companies, with the Furguson, the Eureka, the Pino Blanco, and other well known properties in the neighborhood, and the Hite mine not far distant. These mines are situated in Mariposa county, and several of them are making large and profitable productions of bullion, being thoroughly developed and well outfitted with hoisting and reduction works. On the property of the Bondurant company, elsewhere more fully described in our present issue, operations of an extensive kind have recently been commenced, some of the other companies mentioned having also added largely to their working force, affairs in the whole district moving now with a vigor never before experienced.

About Groveland, in Tuolumne county, new life has in like manner been infused into mining operations through the ore developments being made in the Spring mine at that place. In Amador county quartz mining was never in a more active or prosperous condition than at present. Throughout that section of the mother lode that extends from Jackson to Plymouth, including along it the Kennedy, the Oneida, the Keystone, the Potosi, the Eureka, the several Amadors and other mines, this new movement amounts to almost a revolution. Many of our most shrewd and wealthy operators have lately embarked largely of their means in this historic field where so many fortunes have been made or vastly improved. In the vicinity of Grass Valley, the cradle of quartz mining in California, this interest continues to grow steadily, though attended with less stir than in the several localities above mentioned. At that place, the Idaho mine, through a late strike made in its lower levels, takes a new lease of life, carrying joy to the share holders and encouragement to the business generally.

While a general activity is manifested in all of the localities mentioned, it must, nevertheless, be confessed that a larger investment of capital would develop the resources of each to a much greater extent than can be done solely by unassisted efforts. There are many opportunities for investment in established mines which might, perhaps, be more commendable than experimenting in new localities. Dissatisfaction with a paying strike, and a desire to reach a bonanza, cannot be too strongly condemned, as it leads to failure in accomplishing the results sought for. Continued application in the development of any particular mine cannot fail to produce beneficial results, although not so rapidly—yet they will be in the end more permanent.

Industrial Arts.—A publication which will give information of most valuable and practical character is "Spon's Encyclopedia of Industrial Arts, Manufacturing and Commercial Products." The work is published by E. & F. N. Spon, of London and New York, the well-known publishers of scientific books. Their encyclopedia will be issued in about 30 monthly parts, and will cover a wide range of industrial arts and manufactures. Number four of the series we now have before us. It has a most elaborate illustrated article on alcohol and its manufacture from all substances. Also begins an exhaustive review of the nature and manufacture of alkalies. The plan of the work is to secure articles on the special industries by men practically engaged or interested in them, and thus the treatment may be relied upon as fresh, pertinent and practical. This work should find its way into all libraries, for it will be invaluable as a book of reference,

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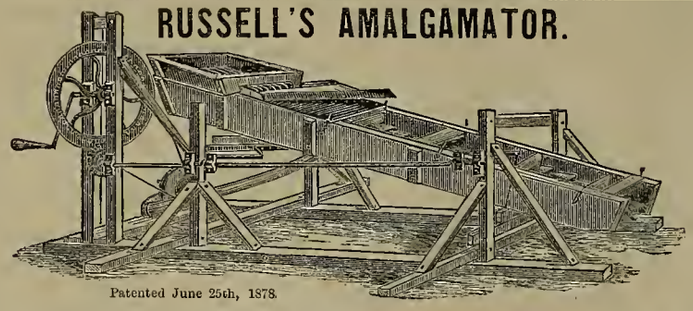

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We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

611 and 613 Front Street, San Francisco

JOHN A. CHURCH,

MINING ENGINEER,

COLUMBUS, OHIO.

C. L. GILLER,

SEAL ENGRAVER AND DIE SINKER,

No. 430 MONTGOMERY STREET, S. F.

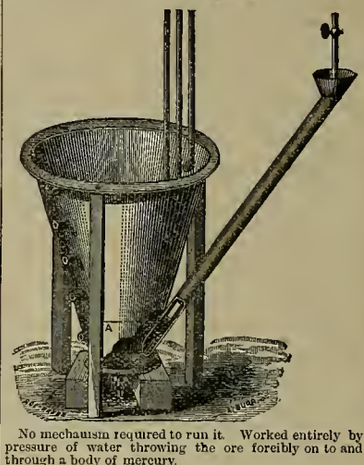
The best Work done on the most reasonable terms on the Coast.

STEVENOT'S

Fine Gold Amalgamator.

Adapted for Ores, Tailings, Slimes, Etc.

Unequaled for Cheapness, Lightness and Practical Results.



No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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Chemist and Mining Engineer,

304 Montgomery St., San Francisco.

REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

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Consulting Engineer & Metallurgist,

Examiner of Mines and Assayer,

702 CALIFORNIA STREET,

Author of— SAN FRANCISCO.

The Explorers', Miners' and Metallurgists' Companion, 672 pages, 33 Illustrations, (2d Edition.) Price	$ 10 50
The Prospector's "Wee Pet" Assayer, (Patented)	100 00
The Testing Machine for Gold, Silver, Lead, etc	40 00
The "Little Wonder" Self-calculating Sample and Button Weigher, (Patented)	25 00
Blow-pipists' Pocket Laboratory of Tools, Fluxes, etc.	50 00
Vest Pocket Blowpipe	3 00

CHARGES.—ASSAYING, $3; TESTING, $2 per metal.

Assaying and Testing Taught.

WANTED—$10,000.

For $10,000 cash in hand I will give a one-half interest in the BLUE JAY and ELEPHANT QUARTZ mines, situated in the French Creek Mining District, Siskiyou County, Cal. And I will take or give a lease on said mines, and pay or receive eight per cent. on the amount invested. For further particulars apply to H. C. Cory, Etna Mills, Siskiyou County, California.

C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address O. C. BITNER, Spenceville, Nevada County, California.

Metallurgy and Ores.

Nevada Metallurgical Works,

No. 23 STEVENSON STREET,

Near First and Market Streets.

Ores worked by any process.

Ores sampled.

ASSAYING in all its branches.

Analysis of Ores, Minerals, Waters, etc.

WORKING TESTS MADE.

Plans furnished for the most suitable process for working Ores.

Special attention paid to Examinations of Mines; plans and reports furnished.

E. HUHN,
C. A. LUCKHARDT,
Mining Engineers and Metallurgists

JOHN TAYLOR & CO.,

Importers of and Dealers in

ASSAYERS' MATERIALS,

CHEMICAL APPARATUS AND CHEMICALS, DRUGGISTS' GLASSWARE AND SUNDRIES, Etc.

512 & 518 Washington St., San Francisco

We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our stock of Clay Crucibles, Muffles, Dry Cups, etc., manufactured by the Patent Plumbago Crucible Co., of London, England, for which we have been made *Sole Agents for the Pacific Coast.* Circulars with prices will be sent upon application.

Also, to our large and well adapted stock of

Assayers' Materials & Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application.

JOHN TAYLOR & CO.

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

Assayer and Metallurgical Chemist,

No. 611 COMMERCIAL STREET,
(Between Montgomery and Kearny,)

SAN FRANCISCO, CAL.

The Miners' Assay Office,

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PRESCOTT, - - - - ARIZONA.

Assays of Silver, $1.50. Gold and Silver, $2. Other Ores at corresponding rates. All assays guaranteed. Gold and Silver melted into Bars. Working Tests made. ☞Mines examined, sales negotiated, etc.

W. H. WILLISCRAFT,
P. O. Box 153. Prescott, Arizona.

THOS. PRICE'S

Assay Office and Chemical Laboratory,

524 Sacramento St., S. F.

G. F. DEETKEN. WM. E. SMITH.

PIONEER REDUCTION WORKS,

Channel Street, off foot of Fourth, San Francisco, Cal.

Highest price paid for Sulphurets, Arseniurets, Tellurides and Gold Ores generally.

Careful attention paid to practical working tests on a large scale of Gold-bearing Quartz and ores of a refractory and sulphureted nature.

Will examine, report on, and survey mining properties.

METALLURGICAL WORKS,

STRONG & CO., 10 Stevenson Street,

ORES SAMPLED, TESTED, ASSAYED.

GUIDO KUSTEL,

MINING ENGINEER and METALLURGIST.

P. O Address: ALAMEDA, CAL.

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Writing Papers.

Notes, Letters, Legals and Foolscaps, all weights. An EXTRA SUPERFINE PAPER at low price.

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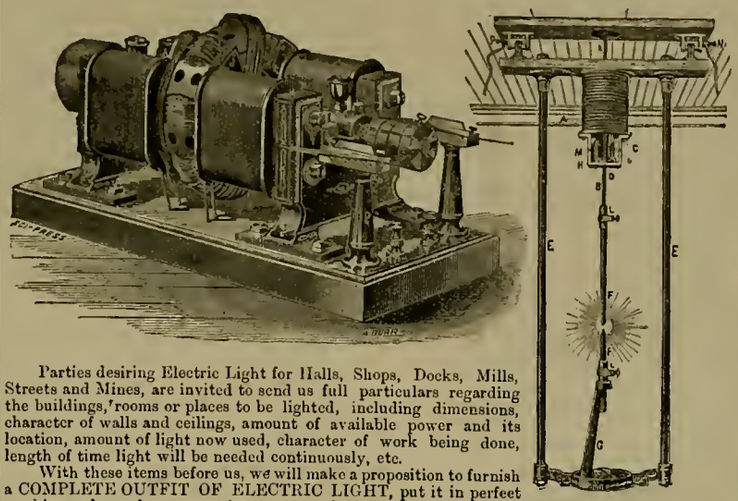
BRUSH PATENT.

The Best, Cheapest, Cleanest, and Most Powerful Light in the World.

In daily use at the Palace Hotel and the Union Iron Works, S. F.



Parties desiring Electric Light for Halls, Shops, Docks, Mills, Streets and Mines, are invited to send us full particulars regarding the buildings, rooms or places to be lighted, including dimensions, character of walls and ceilings, amount of available power and its location, amount of light now used, character of work being done, length of time light will be needed continuously, etc.

With these items before us, we will make a proposition to furnish a COMPLETE OUTFIT OF ELECTRIC LIGHT, put it in perfect working order and guarantee its success and permanence. Address all communications,

S. F. TELEGRAPH SUPPLY CO,

WM. KERR, President,

San Francisco, Cal.

Ingersoll Rock Drills.

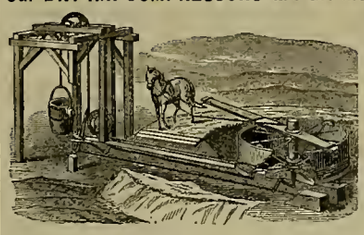
In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

Has less Repairs.

Is Lighter and more Easily Adjusted than any other Drill.

Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

REYNOLDS & RIX, 18 and 20 Fremont Street, San Francisco.

SANDERSON BROS. & CO.'S

Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

A full and complete stock of this reliable and well-known brand of Steel, for mining and other uses, now in stock and for sale

At No. 417 Market St., S. F., - H. D. Morris, Agent.

SHEET IRON PIPE.

FRANCIS SMITH & CO.,

Manufacturers of

THE PATENT CHANNEL IRON WHEELBARROWS.

THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand.

SHEET IRON PIPE.

Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.

Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.

Office and Manufactory, 130 Beale Street, San Francisco.

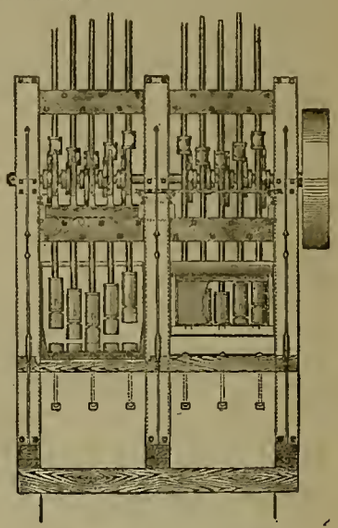
SHEET IRON PIPE.

Machinery.

GOLD AND SILVER

Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



SPERRY'S

Wrought-Iron Frame

FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

No. 145 Broadway, - - NEW YORK.

J. THOMSON. C. H. EVANS

THOMSON & EVANS,

(Successors to THOMSON & PARKER.)

Engineers and Machinists.

Rubber Suction HOSE Made to Order.

All Sizes of Gas and Tube FLANGES.

Steam Pumps, Steam Engines, Hoisting, Pumping, Quartz Mill, Mining, Saw Mill Machinery, Specialties.

Plans and Specifications for Machinery furnished. Repairing promptly attended to.

110 & 112 Beale St., San Francisco.

THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per ton. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco.

Dewey & Co {202 San-some St.} **Patent Ag'ts**

Gas in Metallurgical Operations.

New processes in the production and utilization of hydrogen and other gases, have lately been discovered, which, if true in part only, will accomplish a revolution in the operations for deoxidizing, desulphnrizing and dephosphorizing ores, producing iron and steel, protecting all kinds of iron manufactures from corrosion, rendering them capable of resisting the action even of aqua regia, salts and alkalies.

These gases can be produced continuously and cheaply, and used for fuel in all metallurgical operations in place of solid carbon.

It is claimed that the hydrogen can be produced under a pressure of 30 to 40 pounds per square inch if desired, and can produce a heat more intense and concentrated than any other substance, capahle of reducing titanic and other refractory ores, while the affinity of hydrogen for snlphur and phosphorus as well as for oxygen removes these impurities that carbon cannot reach, and enables pure iron and steel to be manufactured from ores which by ordinary processes are worthless.

The range of the products of these processes extends from a pure hydrogen sponge to the finest quality of steel, and with soft or hard surfaces, as may be desired.

The mode of producing the hydrogen continuously and cheaply results from the discovery that iron at a red heat oxidized by superheated steam is immediately deoxidized by a small amount of naptha vapor. By passing superheated steam over iron heated to redness in a close retort hydrogen is liberated and the iron is oxidized, but the addition of a certain proportion of naptha vapor immediately restores the iron to its normal condition, and with it its capacity for producing hydrogen, and so imperceptible is the interval between the oxidation and deoxidation of the iron that the production of hydrogen is continuous without any consumption of the iron whatever.

In the Barff process for protecting iron surfaces by a coating of magnetic black oxide, produced by the action of superheated steam on iron heated from 500 to 1,000 degrees in close vessels under pressure, the iron was not uniformly coated and would scale off. In fact, this process was a failure, requiring, even for partial results, a perfectly clean surface, as in galvanizing, tinning or nickel plating. But, with the new process, the foul condition of the surface before treatment does not influence the result. The iron heated to redness is subjected to a bath of hydro-carbon vapor, which immediately reduces the oxide and leaves the surface in a condition to be acted on hy the superheated steam, no part escaping its action.

A keg of punchings completely coated with iron rust was thrown into the retort and treated without preparation. They were taken out with polished and smooth surfaces resembling graphite, and the digestion of specimens in nitro-muriatic acid for 12 hours produced no effect.

By this process, it is claimed, can be prepared metallic shingles, Russia sheet iron, fence and telegraph wires, corrugated iron roofing, nails and spikes, water and other pipes, boiler flues, boiler plates, plates for iron vessels, bridge wires, culinary utensils, in fact all surfaces, large or small, except such as aresubject to abrasion, can be fully protected, and without injury to the material.

Trinity County Mines Sold in the East.

Several of the leading New York dailies notice at some length the sale of the Buckeye Gravel Mines recently effected through our townsman, Lloyd Tevis, to parties in that city. What these papers have to say about the repnted merits of this property seems warranted by the favorable reports thereon made by eminent experts and practical miners. What the metropolitan press has to say in commendation of Mr. Tevis is equally warranted hy his history and standing in this community, where, throughout a long series of years, he has been conspicuous for the favorable issue of his many bold and varied business ventures. If in any of these ventures he has ever lost or blundered he has been wise enough to keep it to himself. So lucky has Mr. Tevis heen in all his undertakings, that we may safely predict for this mining enterprise the best results. His connection with it is an auspicious circumstance, if not a pledge, of its ultimate success; and these New York purchasers are to be congratulated on having secured a mining property so inherently valuable and so well endorsed as this Buckeye estate.

At the solicitation of parties here the Eastern investors have unanimously recommended for president of the new company Mr. E. C. Machen, who will, most likely, be chosen to fill that position. Mr. Machen is a young man of good business capacity, heing sharp, wide awake and energetic, hut careful and discreet at the same time.

The new company having ample means will proceed at once to put their mines, amongst the largest in the State, in good shape for active production. Through the retention of Mr. Tevis of a considerable interest in the property, a vigorous and economical management coupled with a generally ahle administration of affairs on this side may be counted npon. A prosperous future awaits tbe enterprise.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports to DEWEY & CO.'S Mining and Scientific Press Patent Agency.]

By Spscial Dispatch from Washington. D. C.

For the Week Ending June 17th, 1879.

216,551.—Fifth Wheel for Vehicle—J. A. Bilz, Pleasanton, Cal.
216,603.—Centrifooal Pump—E. Chaquette, S. F.
216,561.—Smelting Ores—H. H. Eames, S. F.
216,562.—Hydrocarbon Vapor Burner—H. H. Eames, San Francisco.
216,564.—Amalgamator—G. R. Evans, S. F.
216,609.—Hotel Waiter—L. Garrigan, S. F.
216,670.—Sewing Machine—J. J. Graff, S. F.
216,675.—Pipe for Irrigation—E. M. Hamilton, Los Angeles, Cal.
8,758.—Fire Escape Ladder—D. Hayes and W. Free, S. F. (re-issue.)
216,634.—Stalk Cotter—J. Kraft, Downey, Cal.
216,636.—Pneumatio Dredging Tube—W. P. Lewis, Oroville, Cal.
216,691.—Railway Switch—H. A. Norton, Ward City, Nevada.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

News in Brief.

One foot of snow fell recen tly at Silver City, Idaho.

A commercial expedition to Brazil is talked of in New York.

Another Ministerial crisis is imminent in Constantinople.

Bullion in the Bank of England increased £728,000 the past week.

Eighteen persons were killed and 60 wounded in the recent riot in Sicily.

A Mrs. A. Rollann, on a wedding tour, was swept over Niagara Falls.

England and France unite in demanding the abdication of the Khedive.

The water in Frazer river has reached a hight almost unprecedented.

The Bank of Bengal has reduced its rate of discount from 7% to 6%.

Specie increased 17,775,000 francs the past week in the Bank of France.

Prince Pierre Bonaparte is lying at the point of death in Versailles.

Pietre, ex-Chamberlain of Empress Eugenie, has been elected Senator for Corsica.

It is annouuced that Tilden will run for the Governorship of New York this fall.

Specie decreased 74,000 marks in the Imperial Bank of Germany the past week.

The Khedive of Egypt declines to abdicate as demanded by France and England.

At Tracey, Minn., 300 railroad laborers and tramps are making riotous demonstrations.

Work ou the Cascades lock and canal in Oregon has been suspended for six months.

John Moore, who murdered Miss Woodward near Wellford, S. C., has been banged by a mob.

The British steamer *Thessaly*, from Havre for Bombay, has been wrecked 100 miles from Aden.

France will send three cruisers to the Pacific ocean, to protect French subjects in Chile and Peru.

John Kemmler killed his three daughters aged 6, 4 and 1 year, lately, at South Holyoke, Mass.

Louis Napoleon, Prince Imperial of France, met with death at the hands of the Zulus in South Africa.

The Receiver's office at Cherson, Russia, was recently undermined and robhed of 1,500,000 roubles.

The 93d yearly Directory of New York city shows an increase of population for the year of 43,000.

An earthquake in Sicily, Tuesday, destroyed five villages, killing 10 persons and injuriug several others.

The oldest printer in tbe United States—William E. Dean, 91 years—died in New York, Monday 17th.

A dispatch from Havana states tbat vessels are being cut out of the regular Gulf ports by quarantine.

General Negrete has sent a message of suhmission to the Mexican government, asking for clemency.

The insurrection in Algeria continues, and collisions between the troops and insurgents have occurred.

A State convention of brewers, saloon keepers and liquor dealers is to be held July 30th, at Des Moines, Ia.

It is reported from New York that considerable California capital is flowing into that city for investment.

The recall of Mahmoud Nedin Pasha has been countermanded, and the crisis in the Turkish Ministry has ended.

The master of the Spanish brig who defied the Custom-house officials at Pensacola, Fla., has been fined $700.

Gen. Sherman is at Orchard Lake, Micb., attendlng the commencement exercises of the Michigan Military Academy.

By a decision of Judge Bellinger, at Portland, Or., no more Chinese can be employed on the public streets of that city.

The ceremonies of relaying the corner-stone of the Washington headquarters took place June 18th at Valley Forge, Pa.

A company has opened an office in New York for the purpose of mining in Arizona, dealing in land, etc., with $10,000,000 capital.

Every new subscriber who does not receive tbe paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

How to Stop this Paper.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Settlers and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 16,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be beuefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Printer's Proof Press, complete and in good working order, for sale at this office, at the low price of $30. Call and see it.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

METALS.

[Wholesale.

Wednesday M., June 25, 1879.

Iron.—		
American Pig, soft, ton	23 00	@26 00
Scotch Pig, ton	25 50	@26 50
American White Pig, ton	23 00	@— —
Oregon Pig, ton	26 50	@— —
Refined Bar	2½	@ 3½
Horse Shoes, keg	5 00	@— —
Nail Rod	—@	7
Norway, according to thickness	6½@	7
Copper.—		
Sheathing, lb	34 @	35
Sheathing, Yellow	19 @	20
Sheathing, Old Yellow	— @—	
Steel.—		
English Cast, lb	16 @	17
Black Diamond, ordinary sizes	16 @—	—
Drill	16 @	17
Flat Bar	16 @	19
Plow Steel	8 @	
Tin Plates.—		
10x14 I C Charcoal	8½@	9
10x14 I C Coke	7 @	7½
Banca Tin	18 @—	20
Australian	15½@	17
Zinc.—		
By the Cask	9 @—	—
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@—	10
Nails.—		
Assorted sizes	2 90@3	00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, June 25, 3 P. M.

Silver, 37½@12½.
Gold Bars, 890@910. Silver Bars, 8@19 ₰ cent. discount.
Exchange on New York, 20, on London bankers, 493@494. Commercial, 50; Paris, five francs ₰ dollar; Mexican dollars, 92@95½.
London Consols, 97 3-16; Bonds (4½), f04½.
Quicksilver in S. F., by the flask, ₰ lb, 33½c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of June, 1879, an assessment (No. 1) of Three Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 21st day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.
Office, 328 Montgomery St., Room 21, San Francisco, Cal.

Books for Miners and Millmen.

Kustel's Roasting of Gold and Silver Ores, and the extraction of their respective metals without quicksilver. Illustrated. 142 pages. 1870. A valuable and carefully written work. Postpaid, $2.50. Published and sold by Dewey & Co., S. F.

Kustel's Concentration of Ores (of all kinds), including the Chlorination Process for gold-bearing sulphurets, arseniurets, and gold and silver ores generally, with 120 lithographic diagrams. 1867. This work is unequaled by any other published embracing the subjects treated. Post-paid, $7.50. Printed and sold by Dewey & Co., S. F.

Phillips' Explorers, Miners and Metallurgists Companion, comprising a practical exposition of the various departments of exploration, mining, engineering, assaying and metallurgy. 672 pages and 83 illustrations. A most valuable and comprehensive book of reference to prospectors and practical miners. Post-paid, $10 50 Sold by Dewey & Co., S. F.

Aaron's Testino and Working Silver Ores.—Illustrated. 114 pages. 1876. A useful and practical work, free from technicalities and extremely serviceable for miners' use. Post-paid, $2. Published and sold by Dewey & Co., S. F.

Copp's Handbook of Mining Laws.—Containing the U. S. Mining Laws, Digest of Decisions, Forms, etc. 1877. Pocket size and very handy and convenient for miners. Post-paid, $1. Sold by Dewey & Co., S. F.

This paper is printed with Ink furnished by Chas. Eneu Johneon & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y.

A. S. HALLIDIE,

Office, No. 6 California Street,

SAN FRANCISCO.

Manufacturer and dealer in all kinds of

Iron and Steel Wire Rope,

Flat and Round, for Mining, Shipping, Hoisting and General Purposes.

Having the most complete and extensive Wire Rope Works in the United States, I am prepared to manufacture Wire Rope and Cables of any length or size at short notice, and guarantee the quality and workmanship equal to any made at home or abroad.

Iron, Steel and Galvanized Wire

Of all sizes on hand or made to order.

Barbed Fence Wire.

Sole Proprietor of

Hallidie's Endless Ropeway,

For the Transportation of Ores, Etc.

Send for a Circular.

A. S. HALLIDIE,

Office, No. 6 California St., San Francisco

WIRE ROPE AND WIRE.

W. T. GARRATT'S

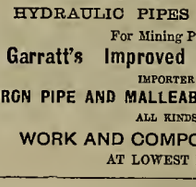
BRASS and BELL FOUNDRY

SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF

Church and Steamboat BELLS and GONGS
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS

General Assortment of Engineers' Findings.



Hooker's Patsnt Celebratsd

STEAM PUMP

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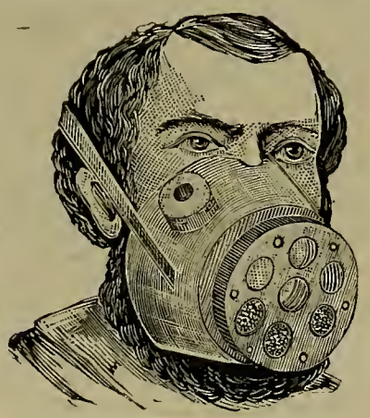

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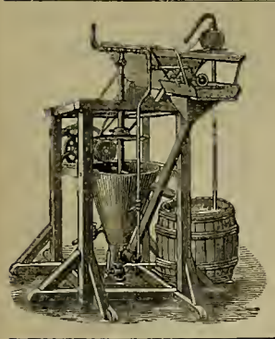

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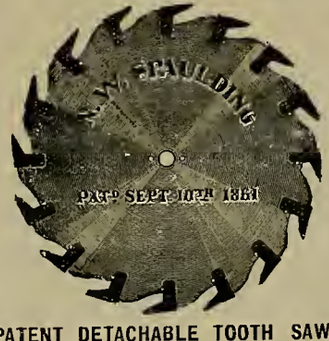

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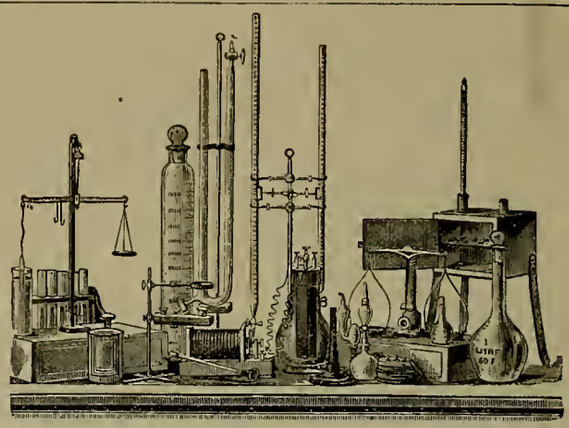

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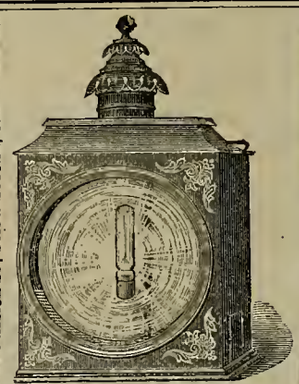

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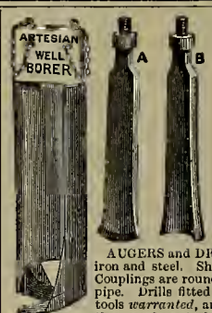

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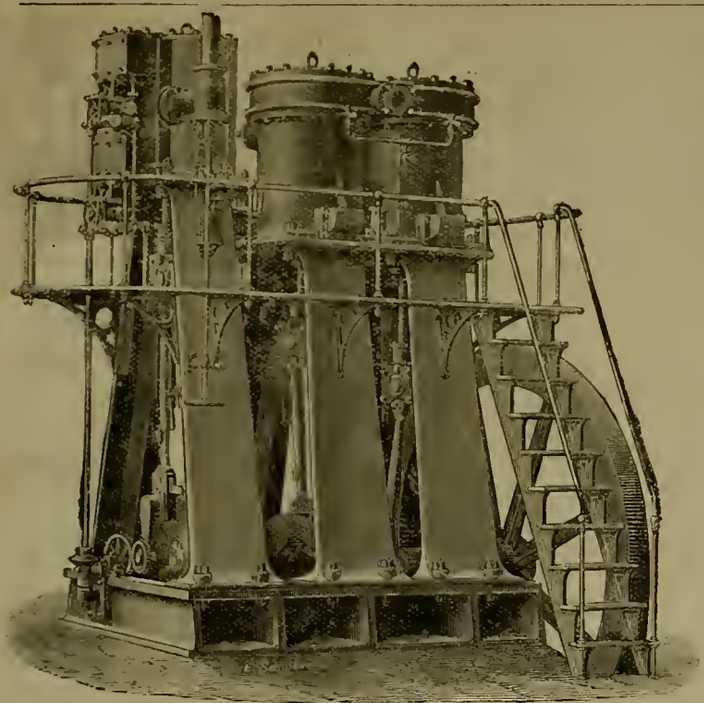

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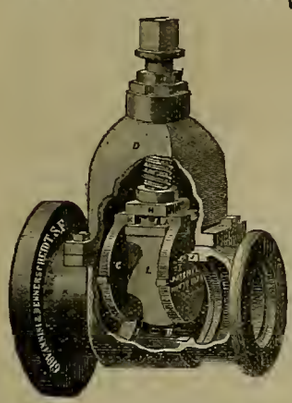

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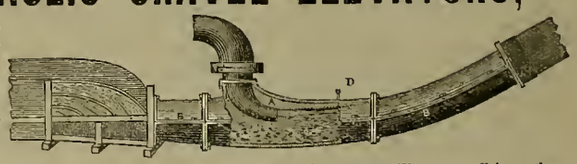

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